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THE EFFECT OF FINANCIAL RISK ON PERFORMANCE OF INSURANCE COMPANIES IN ETHIOPIA

BY

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ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

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**A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF
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MASTERS OF SCIENCE IN ACCOUNTING AND FINANCE.**

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Declaration

I, Daniel Sisay, hereby declare that the thesis work entitled “ The effect of financial risk on performance of insurance companies in Ethiopia” submitted by me for the award of the degree of Masters of Science in Accounting and Finance of Addis Ababa University at Addis, Ethiopia, is my original work and it has never been presented in any university. All sources and materials used for this thesis have been duly acknowledged.

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This is to certify that the thesis prepared by Daniel Sisay entitles: *The effect of financial risk on performance of insurance companies in Ethiopia* and submitted in partial fulfillment of the requirements for the degree of masters of Science in accounting and finance compiles with the regulations of the university and meets the accepted standards with respect to originality and quality.

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Chair of Department or Graduate Program Coordinator

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List of acronyms and abbreviations

ARCH	Autoregressive Conditional Heteroscedasticity
AARDLB	Alberta Agriculture and Rural Development's Livestock Business
BPR	Business Process Reengineering
CLRM	Classical Linear Regression Model
COSO	Committee of Sponsoring Organizations
CP	Contingency planning
CR	Credit risk
CSA	Central Statics Agency
CSA	Central statics agency
DW	Durbin–Watson
dL	Durbin critical lower value
dU	Durbin critical upper value
D411	Dummy Variable for Nice insurance company on 2011
D415	Dummy Variable for Nice insurance company on 2015
ERM	Enterprise Risk Management Theory
GDP	Gross Domestic product
IAP	Insurance association of Pakistan
ISD	Insurance Supervision Directorate
JB	Jarque Bera
LR	Liquidity risk
MOFED	Ministry of finance and economic development
NAIC	National Association of Insurance Commissions
NBE	National Bank of Ethiopia
OLS	Ordinary Least Square
RBS	Risk based supervision
RIR	Reinsurance risk
RMPs	Risks management programs
ROA	Return on Assets Ratio
SAM	Solvency Assessment and Management

SR	Solvency risk
TPR	Technical provision risk
UIC	Uganda Insurance Commission
UR	Underwriting risk

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Abstract

The effect of financial risk has been considered to be an important issue on the performance of insurance companies. This study empirically examines the effect of financial risk on performance of insurance companies in Ethiopia and interprets the result by relating with the regulations. The study used balanced panel model in examining the regression model and collect data from eight insurance companies covering the period of sixteen (16) consecutive years, 2000-2015. To this end, the study employed a mixed method research approach by combining documentary analysis and unstructured in-depth interviews. The study used panel data techniques specifically fixed effect model on the regression analysis and used E-view8 software. The study used one dependent variable return on asset (ROA), six independent variables that are credit risk, liquidity risk, reinsurance risk, solvency risk, technical provisions risk and underwriting risk. The regression result show that credit risk, liquidity risk, solvency risk, underwriting risk and technical provisions risk show negative and significant effect at 1% and 5% significance level on performance of insurance companies in Ethiopia, where as reinsurance risk has insignificant effect at 5% significance level on performance of insurance companies. The research concluded that financial risk has significant effect on the performance of Ethiopian insurance companies. Hence, the study recommend in support of each variables for Ethiopian insurance companies to give due attention on financial risk to enhance their performance significantly.

Key words: - Insurance, Financial risk and Performance

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The insurance sector has been immersed in a permanent updating process, fostering the changes needed to adapt both to the new economic environment and to the growing levels of safety, transparency and effectiveness which are increasingly being demanded by financial markets and citizens (Claudio, 2009).

Insurance companies are in the business of taking risks and Worldwide these companies write policies that deal with specific risks, and in many cases, even underwrite exotic risks. In carrying its core activities, i.e., pricing, underwriting, claims handling and reinsurance management, an insurer will face a wide range of risks which are often interlinked and if not properly managed, could threaten the ability of the institution to achieve and sustain its viability. Therefore, obtaining coverage for every insurable risk is being replaced by the risk management concept. Risk management, which includes insurance coverage, is intended to minimize the costs associated with assuming certain types of risk and providing prudent protection. It deals with pure risks that are characterized by chance occurrence and that may only result in a financial loss (Arif et al., 2015).

Risk management is a process of identifying loss exposures faced by an organization and selecting the most appropriate techniques for treating such exposures (Rejda, 2003). There are many techniques available for insurance companies to manage risks. These include: loss financing, risk avoidance and loss prevention and control (Arif et al., 2015). Management of insurance companies is argued to carefully judge the insurable risks so as not to incur excessive losses in settling claims. Managing risks is an important factor which insurance companies must attend to if they are to achieve financial performance. Insurance companies apply various techniques to manage risks. Some of their risks are re-insured by some companies abroad (Meredith, 2004). The companies also guide clients on how to minimize and prevent losses (UIC, 2000). However, these techniques have not been rightly applied.

The companies have been characterized by low risk transfers, low levels of loss prevention and control and are not avoiding highly insurable risks (Rejda, 2003). Kadi (2003) also stated that most insurance companies are accepting to cover all the insurable risks without first carrying out proper analysis of the expected claims from the clients and they have not put in place a mechanism of identifying various methods of reducing risks. They have accumulated claims from clients and this has led to increased losses (Magezi, 2003). He further stated that loss ratios have consistently increased and therefore hindering financial performance.

Risk is inherent in every business, but organizations that embed the right risk management strategies into business planning and performance management are more likely to achieve their strategic and operational objectives. Risk taking is core to the Insurance Company's business, and the risks mentioned earlier are an inevitable consequence of being in business. The insurance's aim is therefore to achieve an appropriate balance between risk and return and minimize potential adverse effects on its performance. This requires more dynamic and sound Risk Management methods to perform well in an ever dynamic and highly competitive insurance industry, which will translate into having a competitive advantage and thus generate growth in profits (Adrian, 2014).

During the last ten years financial institutions and investors experienced increased volatility in the major and financial commodity markets, with many financial crises. The technological revolution resulted in changes in the operation of markets, increased access to information, changes in the types of services available to investors and major changes in the production and distribution of financial services (Crouhy et al., 2006). Insurance supervisors, along with banking and other sector regulators, play an important role in ensuring a stable financial environment. Therefore, financial institutions and modern businesses concerned with their ability to manage risks and see the need for sound programs of risk management as an essential part of corporate responsibility. They also consider the insurance industry as a mirror for the financial stability of a country (Adrian, 2014).

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

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

1.2 Statement of the problem

Anthony et al. (1997) stated that insurers are in the risk business. In the process of providing insurance and other financial services, they assume various kinds of actuarial and financial risks. Risk arises from raising funds via the issuance of insurance policies and other liabilities. It is the risk that the firm is paying too much for the funds it receives or, alternatively, the risk that the firm has received too little for the risks it has agreed to absorb. If an insurer invests these funds in efficiently traded securities, it should expect to have, on average, a zero net economic profit on those securities. Therefore, if the insurer pays too much for its funds, it cannot expect to earn a satisfactory profit in the long run.

Risk management is one of the most important practices to be used especially in insurance companies in order to get higher returns (Gabriel et al., 2008). Managing financial risk involves setting appropriate risk environment, identifying and measuring the insurances risk exposure, mitigating risk exposure, monitoring risk and constructing controls for protecting the insurance companies from financial risk (Tcankova, 2002). As identified by NBE (2010), credit risk, liquidity risk, reinsurance risk, technical provisions risk and underwriting risk are major risks that can affect Ethiopian insurance companies' performance.

Arif et al. (2015) and Amal (2012) imply that liquidity risk had a positive and significant impact on performance of insurance companies. However, Adrian (2014) result showed that liquidity risk negatively affected the performance of insurance companies. In contrary, Mirie (2015) investigated that liquidity risk had no significant effect on performance of insurance companies.

Mirie (2015) and Arif et al. (2015) confirmed that underwriting risk hadn't significant effect on performance of insurance companies. Nevertheless, (Hifza (2011); Emine (2015); Ana-Maria, et al. (2014); and Ijaz (2015)) studies indicates underwriting risk had a negative and statistically significant effect on performance of insurance companies. Previous Empirical results in different hemisphere of the world indicate various out comes while using the same variables to examine the effect of financial risk on performance of insurance companies.

Hence, as far as the researcher knowledge, a single study corresponding with this research is conducted by Eneyew (2013) about financial risk and profitability of commercial banks in Ethiopia. However, this research is quite different in its industry selection and incorporates additional financial risk variables of insurance companies. These are, underwriting risk, solvency risk, technical provision risk and reinsurance risk. Prior studies, like (Abate (2012); Yuvaraj et al. (2013); Meaza (2014); Hadush (2015)) conducted on determinant of profitability in Ethiopian insurance companies and Daniel et al. (2013) studied on determinant performance in Ethiopia insurance companies.

However, these all researches didn't mainly concentrate on the effect of financial risk area keeping credit risk, solvency risk, technical provision risk and reinsurance risk. Another study conducted by Mistre (2015) on determinant of profitability in Ethiopian insurance companies didn't include credit risk and technical provision risk variables. Similarly, Suheyli (2015) had also studied on the same topic, but the study didn't examine the effect of credit risk and solvency risk on performance of insurance companies in Ethiopia. Hence, NBE (2010) has also given a due emphasis and stressed to track credit risk, liquidity risk, reinsurance risk, technical provisions risk and underwriting risk as they are pointed out to affect performance of Ethiopian insurance companies. Thus, due to the severity of financial risk problem and absence of empirical studies on Ethiopia insurance companies pertaining to this topic incorporating crucial financial risk variables collectively is what motivated the researcher to examine how performance of Ethiopian insurance companies have been affected.

1.3 Research question

Base on the above statement of the problem the researcher develops the following research question.

- What are financial risk factors that affect the performance of Ethiopian insurance companies?

1.4 Objective of the Study

1.4.1 General Objective

The general objective of the study is to examine the effect of financial risk on performance of insurance companies in Ethiopia.

1.4.2 Specific Objectives

The specific objectives of the study are;

- To examine the effect credit risk on performance of insurance companies in Ethiopia.
- To study the effect of liquidity risk on performance of insurance companies in Ethiopia.
- To scrutinize the effect of reinsurance risk on performance of insurance companies in Ethiopia.
- To analyze the effect solvency risk on performance of insurance companies in Ethiopia.
- To investigate the effect technical provisions risk on performance of insurance companies in Ethiopia.
- To inspect the effect underwriting risk on performance of insurance companies in Ethiopia.

1.5 Scope of the Study

The study was limited on the effect of financial risk on performance of insurance companies in Ethiopia and made the analysis using secondary source of data with supported primary source of data. The study had taken in to account the performance of insurance companies for the last 16 years that is from 2000 to 2015. As a result, the research included insurance companies that started operation before 2000, which include one government owned insurance company and 7 private insurance companies in Ethiopian.

The study has taken the cross sections based on their total assets, profit and market share that can refer more than 70% of the total population. The study used six financial risk variables i.e. credit risk, liquidity risk, reinsurance risk, solvency risk, technical provisions risk and underwriting risk. As the result, these variables could explain the topic properly by referring previous empirical works.

1.6 Limitations of the Study

The study has a limitation on the measurement of credit risk variable, because the measurement may not specifically display the default amount from the total uncollectable amount unlike banking industry measurement of nonperforming loan. Hence, the study employed total of outstanding receivable balance to measure credit risk. This measurement has been adopted due to acceptability of the measurement by NBE (2010) and availability of the data. In addition, the study encloses a limitation regarding not to use market risk variable, due to inapplicability of market risk proxy in similar other studies that were conducted in other countries,

1.7 Significant of the Study

Many parties will be benefited from the findings that emerged from the results of the study and these are the following organ that will be benefited;

Management: Administration could be interested in identifying indicators of success and failure to take the necessary actions to improve the performance of the company and choose the right decisions.

Government: Government might be concerned in knowing which companies operate successfully or failed to take the necessary measures so as to avoid crises of the bankruptcy in these companies.

Investors: Investors could be fascinated in such studies in order to protect their investment, and directing it to the best investment.

Customers: Customers may possibly involve in knowing the ability of insurance companies to pay their obligations based on the indicators of success of the companies.

Academician: academicians could have a chance to know the severity of financial risk problem on insurance companies which support students to be familiar with it and find out a solution on their teaching and learning process. Moreover, this research have significant role to play in shading light on how to better understand what variables that have an impact on Ethiopia insurance companies' performance. Additionally, this study has a paramount importance in providing a better ground for insurance managers, business professionals, business initiatives and policy makers. Moreover, the research also contributes an insight point as a stepping stone for further study in the area to future researchers.

1.8 Structure of the study

The research paper is organized in to five chapters. Chapter one is an introduction part where back ground of the study, statement of the problem, objectives of the study, scope, significance and limitation of the study are presented. Chapter two is review of literature in which theories, empirical evidence and conceptual frame work are identified. Chapter three contained research methodology where research design, research approach, population, sampling method, sample size, sources of data, instruments, data analysis technique, model specification, variable definition and hypothesis development were covered. Chapter four focused on the results and discussion in which the findings results that are interpreted. Finally, Chapter five brought to an end the research with summary, conclusion and possible recommendation.

CHAPTER TWO

LITERATURE REVIEW

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

2.1 Theoretical Literature

2.1.1 Meaning of risk

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

2.1.2 Meaning of financial risk

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

Insurers are in the risk business. In the process of providing insurance and other financial services, they assume various kinds of actuarial and financial risks. The risks contained in the insurer's product sales-that is, those embedded in the products offered to customers to protect against actuarial risk-are not all borne directly by the insurer itself. In many instances, the institution will eliminate or mitigate the actuarial and financial risk associated with a transaction by proper business practices; in others, it will shift the risk to other parties through a combination of reinsurance, pricing, and product design. Only those risks that are not eliminated or transferred to others are left to be managed by the firm for its own account. This is the case because the insurance industry recognizes that it should (Anthony et al., 1997).

2.1.3. Financial risk in insurance

Financial risks associated with the provision of insurance services are risks related to the financial operation of a business, such as credit risk, liquidity risk, reinsurance risk, market risk, solvency risk, technical provisions risk, underwriting risk. Then, the following subsections discuss these risks in details.

Credit risk

As stated by Anthony et al. (1997) it is the risk that a borrower will not perform in accordance with its obligations. Credit risk may arise from either an inability or unwillingness on the part of the borrower to perform in the pre-committed contracted manner. In addition, Gerald et al. (2001) mentioned that credit risk basically means the risks that counterparty cannot meet its liabilities. Even if counterparty does manage to meet its liabilities, the value of a given item may decline if its rating is downgraded. Consequently, the insurance company will be subject to credit risk whenever changes in the economic policy framework entail adverse changes in the creditworthiness of invested assets. Mortgages as well are subject to credit risk, which must be adequately assessed by means of internal ratings. When managing credit risk, insurance companies must primarily look to avoid concentration risk (e.g. concentration of investments in a particular investment category, low degree of portfolio diversification) and strive to achieve as much diversification in their investments as possible.

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

Typical areas of concentration for credit risk

These are the following points that NBE (2010) risk management guide line has located the areas which focus on credit risk.

Investing/lending activities: Where credit is extended, almost always with collateral (e.g. Bond). Of course when making investments in any bonds, debentures or other evidences of indebtedness, the insurer is taking on a credit risk. Clearly, such investment area is a major source of credit risk for insurers.

Trade debtors/Financing of premiums: There is the credit risk arising from the fact that policyholders may not remit premiums on a timely basis, whether or not there is a premium financing program in place and whether or not the business is written through an intermediary.

Reinsurance: Insurers, especially general insurers, often rely heavily on their reinsurers for claim reimbursement. The credit risk arising in the reinsurance area can be very significant, making it critically important for insurers to establish formal policies with regard to the selection of reinsurers.

Credit Risk Management

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

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

Liquidity risk

Liargovas et al. (2008) explained liquidity risk as degree to which debt obligations coming due in the next 12 months can be paid from cash or assets that will be turned into cash. It is usually measured by the current assets to current liabilities (current ratio). It shows the ability to convert an asset to cash quickly and reflects the ability of the firm to manage working capital when kept at normal levels. A firm can use liquid assets to finance its activities and investments when external finance is not available or it is too costly. On the other hand, higher liquidity would allow a firm to deal with unexpected contingencies and to cope with its obligations during periods of low earnings.

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

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

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

Anthony et al. (1997) described liquidity risk as the risk of a funding crisis. While some would include the need to plan for growth, the risk here is more correctly seen as the potential for a funding crisis. Such a situation would inevitably be associated with an unexpected event, such as a large claim or a write down of assets, a loss of confidence, or a legal crisis. Because insurers operate in markets where they may receive clustered claims due to natural catastrophes, or massive requests for policy withdrawals and surrenders due to changing interest rates, their liabilities can be said to be somewhat liquid. Their assets, however, are sometimes less liquid, particularly where they invest in private placements and real estate. Given this situation, it is important for an insurer to maintain sufficient liquidity to handle easily any demands for cash. Otherwise, an insurer that would be solvent without a sudden demand for cash may have to sell off illiquid assets at concessionary prices, leading to large losses, further demands for cash, and potential insolvency.

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

Strategic liquidity is a key consideration of asset/liability management because of its potential effect on the ultimate viability of the company. Liquidity is the availability of funds, or assurance that funds will be available, to honor all cash outflow commitments (both on and off-balance sheet) as they fall due. These commitments are generally met through cash inflows, supplemented by assets readily convertible to cash or through the company's capacity to borrow. The risk of illiquidity increases if principal and interest cash flows related to assets, liabilities and off-balance sheet items are mismatched (NBE, 2010).

Liquidity risk management

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

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

Reinsurance risk

According to Munich (2010) reinsurance is a transaction whereby one insurance company (the “reinsurer”) agrees to indemnify another insurance company (the “reinsured, “cedent” or “primary” company) against all or part of the loss that the latter sustains under a policy or policies that it has issued. For this service, the ceding company pays the reinsurer a premium. In addition, the purpose of reinsurance is the same as that of insurance: to spread risk. Reinsurance helps protect insurers against unforeseen or extraordinary losses by allowing them to spread their risks. For example, a catastrophic fire at an industrial enterprise could financially devastate its insurer. With reinsurance, no single insurer finds itself saddled with a financial burden beyond its ability to pay.

Insurers with higher reinsurance dependence tend to have a lower level of firm profitability. It is possible that an insurer that cedes more business to reinsurer and keeps lower retention more or less operates like a reinsurance broker who only transfers risk without underwriting risk and is likely to report less profit for a relatively high percentage of the premium received is ceded to reinsurers (Lee, 2012). Cummins et al. (2008) analyzed that the costs and the benefits of reinsurance for a sample of US property-liability insurers. The results show that reinsurance purchase increases significantly the insurer’s costs but reduces significantly the volatility of the loss ratio. With purchasing reinsurance, insurers accept to pay higher costs of insurance production to reduce their underwriting risk.

As per Suheyli (2015) illustration, insurance companies usually take out reinsurance cover to stabilize earnings, increase underwriting capacity and provide protection against catastrophic losses. Nevertheless, there is a cost for reinsurance. As a result, determining an appropriate ceding level is important for insurance companies, and they have to try to strike a balance between decreasing insolvency risk and reducing potential profitability. Although it increases operational stability, increasing reinsurance dependence, i.e. lowering the retention level, reduces the potential profitability. Purchasing reinsurance reduces insurers’ insolvency risk by stabilizing loss experience, increasing capacity, limiting liability on specific risks, and/or protecting against catastrophes. However, transferring risk to reinsurers is expensive. The cost of reinsurance for an insurer can be much larger than the actuarial price of the risk transferred.

Insurers, especially general insurers, often rely heavily on their reinsurers for claim reimbursement. Among others, the credit risk arising in the reinsurance area can be very significant, making it critically important for insurers to establish formal policies with regard to the selection of reinsurers. The use of reinsurance in capital management, the timing of payments of reinsurance premiums and claims in liquidity management the relationship between the reinsurance program and pricing and underwriting management, are among the factor to be considered in the reinsurance risk management process (NBE, 2010).

Functions of Reinsurance

As stated by Munich (2010) the most common reasons for purchasing reinsurance include:

Capacity Relief- allows the reinsured to write larger amounts of insurance.

Catastrophe Protection- protects the reinsured against a large single, catastrophic loss or multiple large losses.

Stabilization- helps smooth the reinsured's overall operating results from year to year.

Surplus Relief-eases the strain on the reinsured's surplus during rapid premium growth.

Market Withdrawal- provides a means for the reinsured to withdraw from a line of business or geographic area or production source.

Market Entrance- helps the reinsured spread the risk on new lines of business until premium volume reaches a certain point of maturity; can add confidence when in unfamiliar coverage areas.

Expertise/Experience- provides the reinsured with a source of underwriting information when developing a new product and/or entering a new line of insurance or a new market.

Insurance companies purchase reinsurance to provide financial security, to increase their own capacity to underwrite insurance business, and to stabilize their underwriting results. Adherence to sound reinsurance risk management policies and procedures go hand in hand with financial soundness. Failure to adhere to such policies and procedures may lead to an increased risk level assessment. The major risks that arise from weakness in a company's reinsurance risk management program are the impairment of capital or liquidity (NBE, 2010).

Reinsurance risk management

As stated by NBE (2010) each company should develop a comprehensive reinsurance program to address the objectives of its reinsurance risk management policy. In developing the reinsurance program, the company should identify its tolerance to risks in its underwriting book and consider which reinsurance arrangements (e.g., the use of quota share reinsurance, surplus treaties, excess of loss coverage or stop loss policies) are most appropriate to limiting risks above its tolerance level. The reinsurance program should be documented and approved by Insurance Supervision Directorate (ISD). Although the particulars of reinsurance risk management will differ among companies depending upon the nature and the complexity of their underwriting books, a comprehensive reinsurance risk management program requires:

- Identifying when reinsurance is required to limit a company's risk;
- Selecting appropriate reinsurance counterparties and intermediaries to facilitate risk transfer;
- Selecting appropriate reinsurance agreements;
- Developing, documenting and recording effective processes for reinsurance activities;
- Developing and implementing comprehensive procedures to effectively monitor and control the reinsurance activities.

Market Risk

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

Investments Portfolio Management Program

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

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

Solvency risk

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

Solvency is the ability of a company to meet its long-term fixed expenses and to accomplish long term expansion and growth. A solvency ratio of greater than twenty percent is considered financially healthy. Research on the property-liability insurance industry reveals that firms with greater financial strength as measured by insurance rating firms, command higher premiums (Sommer, 1996).

Similarly, Cummins et al., (2002) suggest that insurers with greater ratings are perceived as safer which results in higher returns. A positive linkage between solvency margin and the insurer's financial performance is expected, since the insurers financial stability is an important benchmark to potential customers. In addition, Charumathi (2012) argue that available solvency ratio means the excess value of assets over the value of insurance liabilities and other liabilities of policyholders' and shareholders' funds.

In accordance with SAM (2009) justification, solvency is an ability of an insurer to meet its obligations (liabilities) under all contracts at any time. Due to the very nature of insurance business, it is impossible to guarantee solvency with certainty. In order to come to a practicable definition, it is necessary to make clear under which circumstances the appropriateness of the assets to cover claims is to be considered, e.g. is only written business (run-off basis, break-up basis) to be considered, or is future new business (going-concern basis) also to be considered. In addition, questions regarding the volume and the nature of an insurance company's business, which time horizon is to be adopted, and the setting of an acceptable degree of probability of becoming insolvent, should all be considered. Solvency is used assessing financial health on a runoff basis while capital adequacy is used assessing financial health on a going-concern basis.

Solvency of the insurance categories as expressed through the solvency margin and as such gives us a description of the size and condition of the capital adequacy of insurers. Solvency margin is the amount of capital that an insurance company must hold in order to cover expenses that may occur due to occurrence of unexpected events. Solvency of the company is one of the most sensitive issues when they consider all the calculations in companies engaged in life insurance. Solvency measure, amount of capital needed to make all the obligations of insurers could be settled in their redemption, is calculated as the ratio of the company's credit rating and minimum requirements for solvency (Jasmina, 2003).

As per Shiu (2004) explanation, insurance companies with higher solvency margin are considered to be sounder financially. Financially sound insurance companies are better able to attract prospective policyholders and are better able to adhere to the specified underwriting guidelines. Insurance companies with higher solvency margin outperform those with lower solvency margin.

Technical provisions risk

As referred by Jasmina (2003) it is a risk of holding insufficient technical provisions or holding unjustifiably excessive provisions, where provisions are set at a lower level than actually required then this could present the company's financial position in a better light than it actually is. This could result in inappropriate underwriting decisions being made. For example, more risky policies may be underwritten on the basis that more capital is available to support this than is actually the case, or higher levels of business may be written. In addition, Technical provisions affect the assessment of insurer solvency. Technical provisions are a prerequisite for an adequate assessment of the amount the insurer's liabilities, the insurer's solvency and capital adequacy. In order that level of technical reserves is adequately assessed, but the experienced actuary, it is necessary to choose an appropriate method as input to the valuation.

Insurance companies collect premiums in advance and keep them in reserve accounts for future claim settlements. For instance, most premiums collected by insurance companies are kept in outstanding claims and unearned premiums reserves which are two main accounts in the liability side of the balance sheet. Outstanding claims reserve is considered riskier than ordinary long-term corporate debt since neither the magnitude nor the timing of the cash flows is known (Shiu, 2004).

Giovanni (2001) mentioned that a technical risk for the solvency of insurance companies is certainly that of underestimating technical provisions. This risk concerns the impossibility on the part of the companies to meet their commitments towards the insured and the claimants due to insufficient technical provisions. The risk of insufficient technical provisions should therefore be forestalled both by companies by adopting prudential (this term is to be interpreted in relation to the specific and precise methodologies for calculating technical provisions described in the report) calculation procedures and methodologies when setting up the provisions, and by supervisory authorities. If the possession of sufficient technical provisions is an indispensable requisite for the company's solvency, the level of harmonization among the methodologies adopted in the various countries is equally important.

Technical reserves of insurance companies represent the amount of money that will be a guarantee that all obligations of insurers will be reconciled. Technical provisions are formed from the payment of premium of the insured. Premiums paid by the insured are calculated to provide risk insurance coverage. Of each premium paid, insurer is mandatory that part of the money set aside as funds of the technical provisions (Jasmina, 2003).

According to NBE (2010) technical provision risk is that the company's liability to policyholders could be understated. Clearly from the perspective of financial safety and soundness, the concern is with possible understatement of liability because any such understatement can result in the insurer being unable to discharge all of its obligations to the public. Thus, focus will be given on controlling the risk of liability understatement.

Underwriting risk

Underwriting risk is the risk that the premiums collected will not be sufficient to cover the cost of coverage. Insurance prices are established based on estimates of expected claim costs and the costs to issue and administer the policy. The estimates and assumptions used to develop policy pricing may prove to ultimately be inaccurate. This may be due to poor assumptions, changing legal environments, increased longevity, higher than expected weather catastrophes (Ernst et al., 2010).

As stated by Adams et al. (2003) underwriting risk emphasizes the efficiency of the insurers underwriting activity and is measured through the loss ratio, which is computed as a ratio of gross claims to gross written premium. Underwriting risk reflects the adequacy or otherwise of insurers' underwriting performance.

Huge fluctuations in net premiums written indicate a lack of stability in underwriting operation of an insurance company. An unusual increase in net premiums written might indicate that the company is engaging in the so-called "cash-flow underwriting" to attempt to survive its financial difficulty. However, this is not necessarily the case. An unusual increase in net premiums written could indicate favorable business expansion if it is accompanied by adequate reserving, profitable operations, and stable products mix (NAIC, 2001).

As mentioned by Arif et al. (2015) underwriting guidelines are pivotal to an insurers' financial performance. The underwriting risk depends on the risk appetite of the life insurers'. For instance, as per Fama et al. (1983) argued that organizations that engage in risky activities are likely to have more volatile cash flows than entities whose management is more averse to risk taking. Therefore, a negative connection between the underwriting risk and the insurers' financial performance is expected, since taking an excessive underwriting risk can affect the company's stability through higher expenses.

Another argument raised by Arif et al. (2015) insurance companies with high annual insurance losses will tend to increase their level of corporate management expenses ex-post (e.g., claims investigation and loss adjustment costs) that could further exacerbate a decline in their reported financial performance. In contrast, insurers and re-insurers with lower than expected annual losses are likely to exhibit better financial performance because for example, they do not incur such high monitoring and claim handling costs. In addition, underwriting is the process of selecting certain types of risks that have historically produced a profit and rejecting those risks that do not fit the underwriting criteria of the insurer. Good underwriting of risk selection normally produces a favorable loss ratio. This means the premium collected, less loss and expenses, produces a profit for the insurer. Insurers must carefully underwrite all risks to avoid being the victim of adverse selection. Adverse selection is selection against the insurance company. It is the tendency of insured's with a greater-than-average chance of loss to purchase insurance.

Underwriting is the function of evaluating the subject of insurance, whether a person, property, profession, business, or other entity, and determining whether to insure it. Underwriting is the foundation of the insurance transaction process. Underwriting is the process of determining whether an insured is an acceptable risk, and if so, at what rate the insured will be accepted. Insurers cannot accept every applicant. An insurer has a responsibility to its current policyholders to make sure that it will be able to meet all the contractual obligations of its existing policies. If the insurance company issues policies on applicants that represent risks that are uninsurable or risks that require premiums higher than the insurer may charge can cover, the insurer's ability to meet its contractual obligations is jeopardized (Temecula, 2001).

On the other hand, a for-profit insurer wants to make money and to increase its number of policyholders. No insurer wants to reject applicants unnecessarily. All these factors must be taken into consideration in the underwriting process. Insurers are not always the "victim" in the underwriting process, sometimes they are the problem. Years ago, for example, insurers sometimes approved policies on a post claims underwriting basis (now illegal). The company accepted applicants with little or no real underwriting, but when individuals attempted to file claims, the company engaged in vigorous investigations of the individual's application in an attempt to demonstrate that he or she did not adequately disclose a certain condition. The company would then rescind (cancel) the policy instead of paying the claim alleging misrepresentation of a condition on the part of the applicant (Temecula, 2001).

Underwriting involves the risk of determining the premium (pricing risk) and occurrence risk. Pricing risk is present before the insured event occurs because there is a risk that the costs and claims will be higher than the premiums received. It may be called the risk of insufficiency/inadequacy of insurance premiums, since it implies that the rate of loss occurrence has changed contrary to predictions at the time of determining the premiums. Therefore, it is also called premium risk since it is likely that the insurer will not collect revenue from premiums that would be sufficient to cover the claims. Property and liability pricing risk also includes the catastrophes risks that are arising from extraordinary events that are not sufficiently covered by the premium or reserve risk. Life insurance pricing risk includes biometric risk (including mortality, longevity, morbidity and disability) and the risk of withdrawal (Jakovcevic et al., 2014).

In addition to the above, Jakovcevic et al. (2014) mentioned that the business activity of the insurance company exposes to underwriting risks. The risk of any insurance contract is that an insured event and an unexpected amount of consequential losses will occur. By the nature of insurance contracts, underwriting risk is random and therefore unpredictable and refers to the uncertainty of insurance. The insurance contract is a legal transaction in which the policyholder agrees to pay the insurance premium and the insurer assumes the obligation to pay compensation in the case of occurrence of the insured event.

Underwriting risk management

The following points are underwriting risk management practices that are stated by NBE (2010) risk management guideline. Managing underwriting risk is a fundamental component in the management of safety and soundness of an insurer. Sound underwriting and risk management involves understanding the risk and prudently managing the company's risk/reward relationship. Although the particulars of underwriting will differ among companies depending upon the nature and the complexity of their products and the manner in which they are marketed and serviced, a comprehensive underwriting and risk management program is required as a basic component and processes designed to quantify the risk exposure at various points in time over the insurance cycle, such as when:

- The company accepts insurance risks;
- Material changes occur in insurance exposures for which underwriting, or limitation of risk is required;
- Claims arise requiring approval;
- Ongoing claim assessment is required; and
- The company's capacity to accept insurance risk changes in a material manner.

Companies must develop policies to effectively manage and control liability at these critical points in the insurance cycle. Good risk management with regard to underwriting management also requires:

- Developing, documenting and implementing effective processes for underwriting, for management of product options, and for adjudication of claims; and
- Developing and implementing comprehensive procedures to effectively monitor and control the nature and characteristics of the insurance risks assumed, or claims approved.

2.1.4. Risk Management Theory

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

Enterprise Risk Management Theory (ERM)

According to Gordon et al. (2009), a corporation that chooses to manage risks can do so in two fundamentally different ways: it can manage one risk at a time, or it can manage all of its risks holistically. The latter approach is often called enterprise risk management (ERM). Enterprise risk management (ERM) is a framework that focuses on adopting a systematic and consistent approach to managing all of the risks confronting an organization. Moreover, enterprise risk management defines as the overall process of managing an organization's exposure to uncertainty with particular emphasis on identifying and managing the events that could potentially prevent the organization from achieving its objective.

According to COSO (2004), enterprise risk management is a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.

Contingency Planning Theory

Contingency planning (CP) also known as business continuity planning is a crucial element of risk management. The fundamental basis of Contingency Planning (CP) is that, since all risks cannot be totally eliminated in practice, residual risks always remain. Despite the organization's very best efforts to avoid, prevent or mitigate them, incidents will still occur. Particular situations, combinations of adverse events or unanticipated threats and vulnerabilities may conspire to bypass or overwhelm even the best information security controls designed to ensure confidentiality, integrity and availability of information assets (Hisnson et al., 2008).

In the context of this study, CP is defined as the totality of activities, controls, processes, plans etc. relating to major incidents and disasters. It is the act of preparing for major incidents and disasters, formulating flexible plans and marshaling suitable resources that will come into play in the event, whatever actually eventuates. The very word 'contingency' implies that the activities and resources that will be required following major incidents or disasters are contingent (depend) on the exact nature of the incidents and disasters that actually unfold. In this sense, CP involves preparing for the unexpected and planning for the unknown. The basic purpose of CP is to minimize the adverse consequences or impacts of incidents and disasters (James et al., 2013)

2.1.5. General view of risk on insurance companies in Ethiopia

With the aim of achieving radical and fundamental changes in all areas of its operation (core and support), the National Bank of Ethiopia has carried out Business Process Reengineering (BPR) studies and currently its implementations have been well in progress. With respect to insurance supervision, the move from compliance based to risk based supervision (RBS) is among the major initiatives taken up by the BPR study. To carry on RBS, building up its infrastructures is essential, which in turn calls for the direct involvement, participation and collaboration of all stakeholders. In view of the foregoing, Insurance Supervision Directorate (ISD) has compiled the first draft of the risk management guideline for eight commonly identified and known as inherent and significant risks of insurers. In the process of these risks management, the role to be played by the board of directors, management, internal control system and other concerned parties are clearly addressed (NBE, 2010).

The need to formulate risk management philosophy, strategies, policies and procedures have also been given due coverage. This guideline, first be delivered to all insurance companies for comments. Secondly, after incorporating valid comments of insurers on the guideline, the final draft will be issued for all insurance companies to be used as a basis for developing their own inherent and significant risks management programs (RMPs), which again will be approved by the Bank (NBE, 2010).

All insurance companies are expected to design their RMPs in such a way that it serves as a sufficient standard to gauge and rate their risk management practices which basically focusing on inherent and significant risks. In brief, risks inherent in their nature and significant in their impact are always prevalent in one form or another in insurance operations. How effectively an insurance company alleviates these risks would bring the level of risk exposure down from high category to moderate or from moderate to low. On the contrary, poor management of low inherent risks would push the risk level up to the moderate risk category or from moderate to high-risk category. In this way ISD and insurance companies can manage “net risks” in line with commonly agreed risk measure standards embedded in the RMPs. To sum up, risk management is not a one go affair and hence need to be carried out ongoing basis (NBE, 2010).

The whole aim of this document is, therefore, directed towards ensuring the safety and soundness of the insurance companies’ ongoing basis, focusing on the management of inherent and significant risks, which obviously enable the sector to continue to play its role in supporting the economic development of the country. Each insurer is unique in terms of size, complexity and risk characteristics. The actual policies and procedures adopted by boards of directors will reflect these differences. Specific minimum standards for inherent and significant risks have been prepared by ISD, which comprises; credit risk, market risk, liquidity risk, underwriting risk, technical Reserves risk, operational and technological risk, contagion and related party risk and reinsurance risk (NBE, 2010). Besides, as reported Capital news paper on Sep 5, 2016, the recently formed Ethiopian Reinsurance S.C, the first reinsurance company in the country has officially begun operating. The company made the announcement Tuesday August 23, 2016 at the Hilton Hotel. The latest directive number SRB/1/2014 issued by the National Bank of Ethiopia mandated that all local insurance companies in the country have to allocate 25 percent of their reinsurance payment.

2.1.6. Performance of insurance companies

Measuring the performance of insurance companies has gained the momentum from the last couple of years, because insurance sector is not only an avenue for money saving, but also serves as a vehicle to channel funds in an appropriate way from surplus economic sectors to deficit sectors so as to support the investment activities in the economy. Technically, performance is defined as a subjective measure which determines how well the organizations use their available resources to generate more revenues. Performance measures the financial soundness and health of the organization in monetary terms and thus, can be used to compare the performance of different corporations within any particular industry or between the industries. The performance of the insurance companies plays a pivotal role in the growth of the industry as a whole, which ultimately contributes to the success of an economy. The insurance companies endanger their performance by assuming different types of risks. In order to have full and fuller understanding of the impact of financial risk on the profitability of insurance companies the present study will take into consideration various ratios like solvency, liquidity, profitability (Arif et al., 2015).

Yuvaraj et al. (2013) as cited in William et al. (2004) suggested that although there are different ways to measure profitability it is better to use ROA. In addition to this, performance of insurance companies in financial terms is normally expressed in net premium earned, profitability from underwriting activities, annual turnover, return on investment and return on equity. These measures could be classified as profit performance measures and investment performance measures. However, most researchers in the field of insurance and their profitability stated that the key indicator of a firm's performance is ROA defined as before tax profits divided by total assets.

2.1.7 Financial risk and performance in insurance

As mentioned by Arif et al. (2015) insurance companies are engaged in the business of taking risks. Throughout the globe, these companies deal with a host category of risks which have a direct impact on the performance of these companies. These risks prove to be a greater setback in the process of achieving growth in terms of size, assets and performance of the company which is measured in the form of returns. Thus, such a crippling situation in the organization necessitates a better approach being in place in order to understand these risks and develop an instrumental structure or framework to handle such risks. The key risks which hamper the performance of insurance companies include underwriting risks, market risks, credit risks, operational risks, liquidity risks, and strategic risks (reputation risk, compliance risk or legal risk, agency risk, and so on). Most of these risks can be categorized under a single umbrella term of financial risk.

Barges (1963) defines financial risk to be the added variability of the net cash flows of the owners of equity that results from the fixed financial obligation associated with debt financing and cash leasing. Also, financial risk encompasses the risk of cash insolvency. However, this notion will be expanded to include the risk of being unable to meet prior claims with the cash generated by the firm, which is determined by the dispersion of net cash flows and the level of fixed obligations, as well as the firm's pool of liquid resources (Jacques et al., 1997). In a similar vein, Allen et al. (1997) have explained the increased importance of financial or corporate risks because of a variety of reasons stemming from price fluctuations, interest rate fluctuations, increased competition and greater deregulation. Moreover, with the advent of derivatives which acts as hedging instruments has let the organizations to resort to an additional avenue to protect their organizations against the shocks of financial risks (Bartram et al., 2011).

To put the financial risk in simpler terms, it can be defined as an umbrella term for multiple categories of risk associated with financial transactions. It can further be explained as the possibility where the investors lose money if they are investing in the company whose cash flows are inadequate to meet the matured obligations (Arif et al., 2015).

2.2 Review of Empirical studies

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

The effect of financial risk on performance of insurance companies

Arif et al. (2015) conducted a research on relationship between financial risk and financial performance in Indian insurance industry. Thus, the study employed 24 life insurance companies which are currently operating in Indian insurance market as a target population out of this eight life insurance companies have been selected all belonging to private sector. They used secondary sources of data through annual reports of the selected insurance companies. In order to determine the factors that influence the financial performance in the Indian insurance market during the interval 2005/06- 2012/13, six explanatory variables is tested: capital management risk, solvency risk, liquidity risk, underwriting risk, company size and volume of capital. As for the dependent variable, the financial performance of the insurance companies is measured through Return on Assets Ratio (ROA). Finally, The results of multiple regressions model reveal that capital management risk and solvency risk have a negative and significant relationship with financial performance, while liquidity risk, company size and volume of capital exhibit a positive and significant relationship with financial performance of life insurance companies in India, whereas underwriting risk has negative impact but doesn't have significant effect on it.

Ijaz (2015) studied on macro economy and profitability of insurance companies: a post crisis scenario in Pakistan. Profitability was dependent variables and firm size, financial leverage, underwriting risk, financial soundness, growth opportunities, diversification, working capital management and equity market, and Inflation were independent variables. His last findings were firm size, financial leverage, underwriting risk, financial soundness, growth opportunities, diversification, working capital management and equity market conditions were statistically significant determinants of the profitability of insurance companies. Relative firm size, financial leverage and underwriting risk have negative impact while rest of the variables have positive impact on profitability of life insurance companies.

Ana-Maria et al. (2014) performed on determinants of financial performance in the Romanian Insurance companies. Accordingly, the study used 21 companies and the interval period had started from 2008 to 2012, 13 explanatory variables were tested: insurance financial leverage, company size, number of years since the company operates in the Romanian market, growth of gross written premiums, equity, total market share, diversification, underwriting risk, investment ratio, reinsurance dependence, retained risk ratio, solvency margin and growth of GDP/capita. As for the dependent variable, the financial performance of the insurance companies is measured through the return on total assets ratio. According to the final results, gross written premiums, financial leverage and underwriting risk have a negative effect on return on total assets ratio. In addition to this, company size, retained risk ratio, solvency margin and have positive linkage on return on total assets ratio. Equity, total market share, diversification, investment ratio, number of years since the company operates and growth of real GDP/capita do not have significant linkages with the insurers' financial performance.

Another study made by Amal (2012) on factors affecting the financial performance of Jordanian Insurance Companies Listed at Amman Stock Exchange. The study consisted of all insurance companies' enlisted at Amman stock Exchange during the period (2002-2007) which count (25) insurance company. The study took all of them as a study sample and depended on secondary sources which include books Articles, relevant literature, Jordanian insurance companies' financial statement and reports, and Amman Stock Exchange in order to collect the scientific content of the theoretical framework of the study and to explain the basic concepts of the study. Company Leverage, Company liquidity, Company Age, Company Size, Company management competence index were independent variables where as Financial performance through calculating (ROA) was dependent variable. The collected data was analyzed by using a number of basic statistical techniques such as T-test and Multiple- regression. The results showed that the following variables (Leverage, liquidity, Size, Management competence index) have a positive and significant statistical effect on the financial performance of Jordanian Insurance Companies but Company age has no significant statistical impact on Financial Performance of insurance companies.

Hifza (2011) investigated the determinants of profitability in insurance companies of Pakistan by targeting all Pakistan insurance companies as a population. The sample in this study includes 35 listed life and non-life insurance companies which cover the period of 2005- 2009. Secondary data obtained from the financial statements (Balance sheet and Profit/Loss account) of insurance companies, financial publications of State Bank of Pakistan and Insurance Year Book that is published by Insurance association of Pakistan (IAP). A key indicator of insurance companies profitability is return on assets (ROA), defined as the before tax profit divide by total assets. The study used profitability as dependant variable while age of company, size of company, volume of capital, leverage and loss ratio are independent variables. He utilized a quantitative tool of analysis and findings proved that there is no relationship between profitability and age of the company and there is significantly positive association between size of the company and profitability. The result also showed that the volume of capital is significantly and positively related to profitability. Loss ratio and leverage ratio showed negative but significant relationship with profitability. Moreover, his findings explained that there is no relationship between profitability and age of the company.

Emine (2015) studied on effects of firm-specific factors on the profitability of non-life insurance companies in Turkey. Hence, the study covered a period of eight years between 2006 and 2013. Depending on the existence of data, 24 out of 36 non-life insurance companies operating in Turkey as of 2013 have been selected for this study. Eight independent variables were tested; these are size of the company, age of the company, loss ratio, insurance leverage ratio, current ratio, premium growth rate, motor insurance and premium retention ratio. Two variables were used in this study as the profitability measure of non-life insurance companies. One of these was technical profitability ratio and the other was sales profitability ratio. The main results of the study demonstrated that the profitability of non-life insurance companies was statistically significant and positively related to the size of the company and premium growth rate, whereas profitability was statistically significant and negatively related to the age of the company, loss ratio, and current ratio. However, the share of motor insurance in the companies' insurance portfolio and the premium retention ratio were not found to be important explanatory variables. Besides, the relationship between insurance leverage ratio and technical profitability ratio were significant at the 5% level. However, the relationship between insurance leverage ratio and sales profitability ratio were not statistically significant.

Omasete (2014) conducted a research on effect of risk management on financial performance insurance companies in Kenya. The study adopted a census survey of all the 49 registered insurance companies operating in Kenya and took the whole population of insurance companies as a sample. Secondary data for the period 2008 to 2012 was used in this study. The independent variables were risk identification, risk assessment, risk mitigation and risk management implementation and monitoring also financial performance (measured using ROA) was dependent variables. At 5% level of significance and 95% level of confidence, risk identification, risk mitigation, risk management program implementation & monitoring and risk assessment & measurement all significantly influenced the financial performance of insurance companies in Kenya. The study found risk identification to be the most significant in influencing the financial performance of Kenyan insurance companies, followed by risk mitigation, risk management program implementation & monitoring and risk assessment & measurement respectively.

Adrian (2014) studied on the relationship between financial risk and financial performance insurance companies in Kenya. The population for this study was 49 insurance companies in Kenya and the study period was cover 5 years period starting from year 2009 to 2013 and selected since it is recent and it showed the existing relationship between financial risk management and financial performance of insurance companies in Kenya. Due to this fact, he acquired the entire population as a sample. The study collected secondary data from insurance companies' annual report for capital management risk, financial risk, solvency risk, size and liquidity risk of independents variables and financial performance of the company which was measured using return on Asset (ROA) as dependent variables. Data analysis was done using SPSS Version 20 whereby inferential statistics was applied by means of multiple regression model. He had only made test of significance, but he overlooked proving of other model assumptions. As a final point, the study found that capital management risk, financial risk, solvency risk and liquidity risk negatively affect the financial performance of insurance companies in Kenya, but size of the insurance companies was found positively influence to the financial performance of insurance companies in Kenya.

Eneyew (2013) made a research on financial risks and profitability of commercial banks in Ethiopia. The study included only eight commercial banks for twelve consecutive years (2000 to 2011). The study employed secondary sources data which was gathered from NBE about audited financial statements of the banks. He selected credit risk, liquidity risk, interest rate risk and foreign exchange rate risk as independent variables and Size, Bank Capitalization, GDP Growth Rate and Inflation growth rate as controllable variables. In addition to this, he applied return on asset (ROA) for measurement of profitability which was taken as dependent variable. He used a panel data to make a quantitative analysis and also tested the basic model of assumptions. The study found that credit risk was the major factor that affects the profitability of Ethiopian commercial banks negatively. Next to this, liquidity risk was also the major factor that adversely affects profitability of Ethiopian commercial banks. Profitability of the bank would be adversely affected by Interest rate risk. However, this negative relationship was not found statistically significant even at 10 % significance level ($p\text{-value} = 0.8964$). There is insignificant negative relationship between foreign exchange rate risk and profitability. In line with this, bank capitalization was the major factor that can determine the variation of profitability in Ethiopian commercial banks. Ethiopian banks profitability increases as the size of the banks increase, which strengthens the fact that larger banks are enjoying higher profit than smaller banks of the country. GDP growth revealed a positive and statistically significant association with the profitability of Ethiopian commercial banks. There is inverse relationship among inflation and profitability of Ethiopian commercial banks. However, this negative association was not statistically significant; thus, the findings suggested that inflation was not a major factor that determine the profitability of Ethiopian banks.

Yuvaraj et al. (2013) studied on the performance of insurance companies in Ethiopia. The study took nine insurance companies within the specified period of time from June 2003 to June 2011. They employed Return on Assets (ROA) as dependent variables and independent variables are age of insurance companies, size of insurance companies, volume of capital, leverage ratio, growth rate, tangibility of company assets and liquidity ratio. There source of data was secondary data which they had taken from annual reports that contain detailed consolidated balance sheets and income statements. Moreover, they applied quantitative analysis by testing model assumptions and found that significant relationship between age and profitability measured by ROA and also size is positively correlated with ROA. Moreover, there is significant and negative relationship between leverage ratio and ROA plus significant positive correlation between firm growth and ROA. In line with this, significantly strong correlation between volume of capital and ROA along with significant relationship between tangibility of assets and ROA as well slightly negative correlation between liquidity and ROA.

Daniel et al. (2013) studied on firm specific factors that determine insurance companies' performance in Ethiopia. The study employed only nine insurance companies over the period 2005-2010. They exercised secondary sources of data by acquiring an audited annual reports (Balance sheet and Profit/Loss account) of insurance companies were obtained from National Bank of Ethiopia (NBE) and insurance companies' annual publication reports. In addition, the study employed return on total assets (ROA) a key indicator of insurance company's performance was used as dependent variable while age of company, size of the company, growth in writing premium, liquidity, leverage and loss ratio are independent variables. According to the quantitative analysis the results of regression analysis revealed that insurers' size, tangibility and leverage are statistically significant and positively related with return on total asset; however, loss ratio (risk) is statistically significant and negatively related with ROA. Thus, insurers' size, loss ratio (risk), tangibility and leverage are important determinants of performance of insurance companies in Ethiopia. But, growth in writing premium, insurers' age and liquidity has statistically insignificant relationship with ROA.

Patrick (2015) conducted a research on influence of risk management practices on financial performance of life assurance firms in Kenya. The Study used 118 respondents from the five major insurance firms in Kenya listed in the Nairobi stock market. The study used a structured questionnaire to collect primary data. Secondary data was obtained from audited financial statements of life assurance companies in Kenya for the period of (2009-2013). Underwriting practices, Premium valuation methods, Adjustment provisions of claims' liabilities are independent variables and Profitability, Value of investments & Number of policy holder are dependent variables. From the findings, the study established that Premium valuation method is positively significant to influence risk management practices thus the study concludes that Premium valuation methods had positive influence on financial performance of life assurance firms in Kenya. The study established that underwriting guidelines employed by insurance companies in Kisii County increase value of investment and had a positive effect on financial performance of life assurance firms in Kenya. The study revealed that adjusting claims and benefits paid to policy holders of insurance firms' increase value of investment and this gave a reason for claims adjustment to get the best estimate of acceptable costs for every person which is usually determined by observed costs based on risk factors.

Mirie (2015) conducted a research on determinants of financial performance in general insurance companies in Kenya. The study comprised all the 23 general Kenyan insurance firms. The data was gathered from 22 general insurance companies on the variables of interest representing a 95.65% response rate. One firm was dropped from the sample as it had been placed under receivership as at the time of the study. The study used secondary data for the four financial periods, 2009-2012 and the study employed a multiple regression analysis model. leverage, retention ratio, equity capital, size, management competence index, ownership, age, liquidity & underwriting risk were independents variable and return on assets (ROA) was dependent variable. Based on the findings, financial performance was positively related to leverage, equity capital, management competence index and negatively related to size and ownership structure. The study did not find a relationship between performance and retention ratio, liquidity, underwriting risk and age; it means that financial performance was not significantly predicted by retention ratio, liquidity, underwriting risk and age.

Joseph (2011) studied on financial performance of life insurance companies in Ghana. The study ten (10) companies were selected based upon the availability of data and the number of years that an insurer has been in operation. He applied secondary source of data through collecting annual financial statements of the ten (10) companies covering the period of 2000 to 2010 were used for the analysis. The data on the macroeconomic conditions of the Ghanaian economy were taken from the databases of the Ghana Statistical Service and the Ministry of Finance and Economic Planning. Sales profitability, Investment income and underwriting profit were dependent variables for profit measurement while gross written premiums, claims, expenses on management, reinsurance, total debts, size of company, interest rate and gross domestic product were independent variables. A panel data analysis approach was adopted for the evaluation of the determinants of insurers' profitability. Gross premium written has a significant impact on all the three measures of life insurers' profitability. Claims payments has a negative relationship with both the underwriting profit and the total net profit but has a positive association with investment income. The expenditure on management is statistically significant to both the level of the total net profit and the investment income. Insurers' assets (size) have a significant positive link with both the total net profit and the underwriting profit. Leverage has a positive relationship with all the three measures of insurers' profitability. Interest rate has a positive relationship with underwriting profit and the sales profitability.

Abate (2012) made a research on factors affecting profitability of insurance companies in Ethiopia. He targeted all Ethiopian insurance companies out that nine insurance companies had been taken as a sample and it was considered that purposive sampling was employed so as to include all insurance companies established and serving with in the specified period of time from June 2003 to June 2011. He employed a secondary source of data by taking audited financial statements from NBE. Age of company, volume of capital, company size, leverage, firm growth were independent variables and return on asset for dependent variables. Finally, from the regression results; growth, leverage, volume of capital, size, and liquidity were identified as most important determinant factors of profitability hence growth, size, and volume of capital were positively related. In contrast, liquidity ratio and leverage ratio are negatively and significantly related with profitability. Lastly, age of company and tangibility of assets were not significantly related with profitability.

Hadush (2015) studied on determinants of profitability in Ethiopia insurance Companies. For this purpose, the study took all Ethiopian insurance companies as targeted population then performed for a panel of nine Ethiopian general insurance companies for the study period of 2005-2014. The study has used secondary data or quantitative nature of data obtained from the annual audited financial statements (balance sheet and profit/loss account, and revenue account) of insurance companies, financial publications of NBE by applying a statistical package data called Eviews 7 only. Profitability is dependent variable while liquidity, tangibility, volume of capital, premium growth, claim ratio, real GDP and inflation) are independent variables. He used a quantitative tool of analysis and made a model assumptions test for the model assumptions. Regression result shows that tangibility, volume of capital, premium growth, claim ratio, and real GDP are identified as most important determinants of profitability hence tangibility, volume of capital, premium growth are significant and positively related. In contrast, claim ratio and real GDP are negatively but significantly related with profitability. However, liquidity and inflation are not significantly related with profitability.

Meaza (2014) studied on determinants of insurance companies' profitability in Ethiopia by examining the effects of firm specific and macroeconomic factors on profit. For this reason, the study included ten insurance companies for six years (2008-2013). Secondary data obtained from the financial statements (Balance sheet and Profit/Loss account) of insurance companies, and financial publications of MOFED were analyzed. Profitability peroxide by ROA was dependent variables while size of companies, leverage, tangibility of assets, liquidity, loss ratio, firm growth, managerial efficiency, inflation rate and economic growth were independent variables. All model assumptions test had been done and from regression result; size, leverage, tangibility of asset, loss ratio/ risk, firm growth and managerial efficiency were identified as significant determinants of profitability hence firm size, tangibility of asset, firm growth and, managerial efficiency were positively related. In contrast, leverage and loss ratio/ risk were negatively but significantly related with profitability. Liquidity, inflation and economic growth were not significant determinants of profitability.

Mistre (2015) made a research on determinants of profitability on insurance Sector: Evidence from Insurance Companies in Ethiopia. In order to carry out the study, secondary data of nine insurance companies over the period of 2003-2014 was obtained on the financial performance from the annual reports and audited financial statements. Age of company, size of company, leverage, tangibility of Assets, liquidity, premium growth, loss ratio, reinsurance dependence, solvency margin and growth in gross domestic product were independent variables while profitability measured by ROA(return on assets was dependent variable. The result of the study illustrated that insurers' size and solvency margin were positively related to insurance performance, while loss ratio and leverage ratio were negatively related to profitability (ROA). Whereas, premium growth, growth in gross domestic product, age of insurance companies and liquidity had insignificant impact on profitability of insurance companies in Ethiopia and determinates such as tangibility of asset and reinsurance dependency had insignificant impact on profitability of insurance companies. Suheyli (2015) conducted a research on determinants of insurance companies' profitability in Ethiopia. In order to achieve this objective, the study used mixed research approach. Panel data covering eleven-year period from 2004 to 2014 were analyzed for nine insurance companies from the total population of all insurance companies registered by NBE and under operation in Ethiopia. Also in-depth interview was conducted with company managers. Underwriting risk, reinsurance dependence, solvency margin, liquidity, company size, premium growth, technical provisions, inflation and growth rate of GDP were independent variables while profitability was dependent variable. The findings of the study showed that underwriting risk, technical provision and solvency ratio have statistically significant and negative relationship with insurers' profitability. However, reinsurance dependence had insignificant relationship with profitability. On the other hand, variables like liquidity, company size and premium growth have a positive and statistically significant relationship with insurers' profitability. In addition, economic growth rate has significant influence on profitability whereas inflation has insignificant influence on insurers' profitability. The study provided evidence that underwriting risk, technical provision and liquidity were the most important factors that affect profitability of insurance companies in Ethiopia.

2.3 Literature gap

Empirical studies were conducted on relationship between financial risk and financial performance by Arif et al. (2015) and Adrian (2014). However, Arif et al. (2015) studied in India life insurance companies, so that; the study characteristic is different from developing countries regarding their government regulation, culture of the business, people attitude and economic growth. In addition to this, Arif et al. (2015) didn't include non life insurance companies and had taken only India life insurance companies. With respect to Adrian (2014), the study had only made test of significance and overlooked proving of other model assumptions. Moreover, both of the above two empirical study only employed quantitative research approach.

Ijaz (2015) made a research on effect of macro economy factor on profitability of insurance companies, Hifza (2011) and Emine (2015) had also conducted a study on determent of profitability in insurance companies and another study made by Amal (2012) on determinant of financial performance in insurance companies. However, the study feature is diverse from developing countries due to the characteristics of government regulation, culture of the business, people attitude and economic growth. Thus, the researcher has taken the above gaps in to account for the study and this study might be differ with above other countries empirical studies due to the above mentioned reasons.

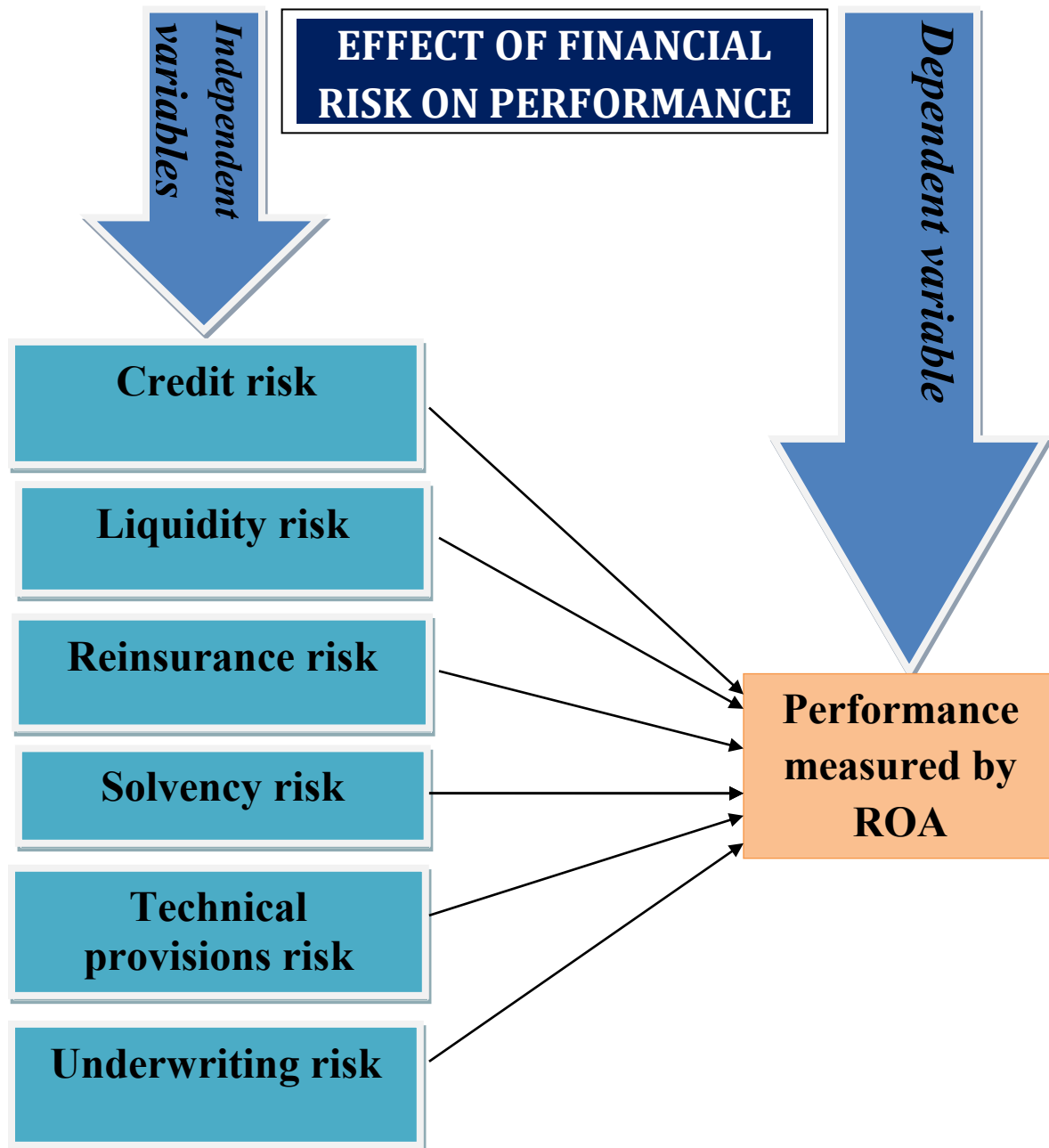
In line with this, Suheyli (2015) had also conducted a research on determinant of profitability in Ethiopian insurance companies, but the study didn't include credit risk and solvency risk as measurement of total liabilities over total assets that can show the insurance companies how much they are solvent for their total liabilities. However, this study has included these significant variables. In addition, prior studies conducted on determinant of profitability in Ethiopian insurance companies by (Yuvaraj et al. (2013); Meaza (2014) and Hadush (2015)) and determinant performance in Ethiopian insurance companies by Daniel et al. (2013). Their study had limited on quantitative approach and their time sires period not more than eleven years. Thus, this study employed a mixed approached by taking sixteen (16) years for 2000 to 2015 period of interval which helps to obtain recent information about the effect of financial risk on Ethiopian insurance companies' performance.

As per NBE (2010), credit risk has a great impact on insurance companies' performance by referring credit risk is the risk of financial loss resulting from the failure of a debtor to honor its obligations to the company and the risk arises from a weakening of the credit portfolio is the impairment of capital or liquidity. However, all available previous studies conducted in Ethiopia insurance companies not incorporate this variable on their research work. Thus, this study would fill all of the above stated gaps by taking evidences from Ethiopian insurance companies.

2.4 Conceptual Frame Work

From the theoretical and emperical literature reviews, the following conceptual framework of the study is developed by the researcher.

Figure 2.1 the conceptual framework or model of the study



Source: - Compiled by the researcher mainly based on Arif et al., (2015) and NBE (2010)

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter deals with research methodology used to carry out the research. The chapter is organized in eight sub sections. In its first part there is a research design, then after it presented subsequently about research approach, population, sample and sampling technique, data type, sources and instruments, data analysis and model specification. The final two parts presented variables selection and hypothesis developments. Finally, operationalizations of study variables are presented.

3.1 Research design

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

3.2 Research approach

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

Hence, based on the above discussions of the three research approaches and by considering the research problem and objective, this study used mixed research approach. Therefore, to have a better insight and gain a richer understanding about the effect of financial risk on insurance companies performance, the quantitative method supplemented by the qualitative method of inquiry that helps to get benefits of a mixed methods approach and to mitigate the bias in adopting only either quantitative or qualitative approach.

Thus, employing mixed approach is used to counterbalance the biases (limitations) of applying any of a single approach and a means to offset the weaknesses inherent within method with the strengths of the other method (Creswell, 2003). In addition, adopting mixed approach in this study is justified as it provides the best understanding of a research problem because it can open the door to multiple methods of data collection and to both generalize the findings to a population and develop a detailed view of the meaning of a phenomenon or concept for individuals (Creswell, 2003). Thus, this study employed mixed research approach start with a quantitative study and identifies results then follows up these results with an unstructured in-depth interview of qualitative study to have a better understanding about the effect of financial risk on Ethiopian insurance companies' performance.

3.3 Population of the Study

The study populations are all insurance companies registered by NBE. Currently, there are seventeen insurance companies in Ethiopian that are one government owned and sixteen privately owned insurance companies these are; Ethiopian insurance corporation, Awash insurance S.C, African insurance S.C, National insurance company of Ethiopia S.C, Nyala insurance S.C, Nile insurance S.C, United insurance S.C, Global insurance S.C, Nib insurance S.C, Lion insurance S.C, Oromia Insurance S.C, Abay insurance S.C, Berhan insurance S.C, Tsehay insurance S.C, Ethio life and general insurance S.C, Lucy insurance S.C and Bunna insurance S.C.

3.4. Sample and Sampling Techniques

The total populations of insurance companies are seventeen but for the study purpose the researcher used sample of eight insurance companies. These insurances were selected due to their market share, total assets and profit. As NBE (2014/15) annual report stated that these eight insurance companies together accounted for 70% of the market share based on their number of branch and capital held by all Ethiopian insurance companies. In addition, according to their audited financial statements, sample of eight insurance companies has covered 86% and 96% of total assets and profit within the total population respectively as calculated their average amount with in the period of sixteen (16) years from 2000 to 2015. Based on these reasons, it is reasonable that sample of eight insurance companies can properly refer the total number of the population.

Therefore, the study covered a period of sixteen (16) years from 2000-2015 and included Ethiopian insurance companies those who have sixteen (16) and above establishment year. Due to this fact, the sample of insurance companies are Ethiopian insurance corporation, Awash insurance S.C, African insurance S.C, National insurance company of Ethiopia S.C, Nyala insurance S.C, Nile insurance S.C, United insurance S.C and Global insurance S.C. According to Suheyli (2015) as cited in Singh (2006) when the subjects used in the sample is homogeneous, using purposive sampling technique is appropriate. Hence, the researcher employed purposive sampling method to draw the sample from the population and meet the study objective. The matrix for the frame is 16*8 that includes 128 observations.

3.5 Data sources and instruments

This study obtained the necessary data through both primary and secondary data. This research mainly used from secondary sources of data, but for the purpose of supporting the findings of the research, primary data source is employed to provide reasonable and strong analysis. Primary data on the effect of financial risk on insurance companies' performance is collected from the sample of eight insurance companies' finance and risk department managers and two senior officers of national bank of Ethiopia (NBE) insurance supervision department through unstructured face to face interview.

In addition to this, secondary data on sample of eight insurance companies are obtained from insurance companies' audited financial statements and annual reports filed with NBE through document review. Furthermore, secondary data collected from books, journals and website.

3.6 Data analysis

To achieve objective of the study, the study mainly concentrated on quantitative analysis and supported by qualitative analysis. Hence, the researcher used econometric model to identify and measure the effect of financial risk on performance of Ethiopian insurance companies and used Ordinary Least Square (OLS) method using Eviews-8 econometric software package for the study. According to Brooks (2008) regression is concerned with describing and evaluating the relationship between a given variable (usually called the dependent variable) and one or more other variables (usually known as the independent variables. Thus, the researcher adopted panel data regression model to examine the effect of financial risk on insurance companies' performance.

As stated by Brooks (2008) panel data is favored for situation often arises in financial modeling where we have data comprising both time series and cross-sectional elements. In addition, we can address a broader range of issues and tackle more complex problems with panel data than would be possible with pure time-series or pure cross-sectional data alone. Accordingly, the study model focused on panel data technique that comprises both cross-sectional elements and time-series elements; the cross-sectional element is reflected by the different Ethiopian insurance companies (eight) and the time-series element is revealed by the period of study (2000-2015). Therefore, the collected panel data is analyzed using descriptive statistics, correlations and multiple linear regression analysis. The rational for choosing Ordinary Least Square (OLS) is that, if the Classical Linear Regression Model (CLRM) 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). Diagnostic checking is done to test whether the sample is consistent with the following assumptions. According to Brooks (2008), the assumptions of ordinary least squares are:

- I. The errors have zero mean ($E(u_t) = 0$)
- II. variance of the errors is constant ($\text{Var}(u_t) = \sigma^2 < \infty$)
- III. Covariance between the error terms over time is zero ($\text{cov}(u_i, u_j) = 0$ for $i \neq j$)

IV. Test for Normality ($u_t \sim N(0, \sigma^2)$)

V. Multicollinearity Test

If all the above assumptions are consistent with the sample, E-view result will be accurate and reliable. The following tests are done in this research to test the above assumptions.

I. The errors have zero mean ($E(u_t) = 0$)

Relay on Brooks (2008), the first assumption required is that the average value of the errors is zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated.

II. Variance of the errors is constant ($\text{Var}(u_t) = \sigma^2 < \infty$) (heteroscedasticity)

According to Brooks (2008), the variance of the errors is constant this is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be heteroscedastic. If heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid as it will underestimate the variances and standard errors. There are several tests to detect the Heteroscedasticity problem, which are Park Test, Glesjer Test, Breusch-Pagan-Goldfrey Test, White's Test and Autoregressive Conditional Heteroscedasticity (ARCH) test. In this study, the popular white test was employed to test for the presence of heteroscedasticity. The hypothesis for the Heteroscedasticity test was formulated as follow;

H_0 : There is no Heteroscedasticity problem in the model.

H_1 : There is Heteroscedasticity problem in the model.

$\alpha = 0.05$

Decision Rule: Reject H_0 if p-value is less than significance level. Otherwise, do not reject H_0 .

III. Covariance between the error terms over time is zero ($\text{cov}(u_i, u_j) = 0$ for $i \neq j$) (Autocorrelation)

According to Brooks (2008), when the error term for any observation is related to the error term of other observation, it indicates that autocorrelation problem exist in this model. In the case of autocorrelation problem, the estimated parameters can still remain unbiased and consistent, but it is inefficient. The result of T-test, F-test or the confidence interval will become invalid due to the variances of estimators tend to be underestimated or overestimated. Due to the invalid hypothesis testing, it may lead to misleading results on the significance of parameters in the model. Therefore, the study test for the existence of autocorrelation, the popular Durbin–Watson test and Breusch-Godfrey test were employed.

H_0 : There is no autocorrelation problem in the model.

H_1 : There is autocorrelation problem in the model.

$$\alpha = 0.05$$

Decision Rule: Reject H_0 if p-value less than significance level. Otherwise, do not reject H_0 .

VI. Normality ($u_t \sim N(0, \sigma^2)$)

As per Brooks (2008) normality tests are used to determine if a data set is well-modeled by a normal distribution. With the normality assumption, ordinary least square estimation can be easily derived and would be much more valid and straight forward. This study used Jarque Bera Test (JB test) to find out whether the error term is normally distributed or not. The hypothesis for the normality test was formulated as follow:

H_0 : Error term is normally distributed

H_1 : Error term is not normally distributed

$$\alpha = 0.05$$

Decision Rule: Reject H_0 if p-value of JB tests less than significance level. Otherwise, do not reject H_0 .

IV. Multicollinearity

According to Brooks (2008), Multicollinearity will occur when some or all of the independent variables are highly correlated with one another. If the multicollinearity occurs, the regression model is unable to tell which independent variables are influencing the dependent variable. This study used high pair-wise correlation coefficients method to test the presence of multicollinearity problem in a regression model, because it shows the correlation of independent variables between each other one by one. Malhotra (2007) stated that multicollinearity problems exists when the correlation coefficient among explanatory variables should be greater than 0.75. However, Brooks (2008) mentioned that if the correlation coefficient along with the independent variables is 0.8 and above, multicollinearity problems will be existed.

Model Specification Test

According to Brooks (2008), Specification error occurs when omitting a relevant independent variable, including unnecessary variable or choosing the wrong functional form, so that regression model will be wrongly predicted. If the omitted variable is correlated with the included variable, the estimators are biased and inconsistent. If the omitted variable is not correlated with the included variable, the estimators are unbiased and consistent. Ramsey RESET test was used to see whether the developed model is correctly regressing.

H_0 : the model is correctly specified

H_1 : the model is not correctly specified

$\alpha = 0.05$

Decision Rule: Reject H_0 if p-value is greater than significance level. Otherwise, do not reject H_0 .

3.7 Model specification

According to Brooks (2008), it is very easy to generalize the simple model to one with k regressors (independent variables). $Y_i = \beta_1 + \beta_2 X_{1i} + \beta_3 X_{2i} + \dots + \beta_k X_{ki} + \varepsilon_i$, $i = (1, 2, \dots, i)$. So, Where Y_i is the i^{th} observation of the dependent variable, $X_{1i}, \dots, X_{ki}$ are the i^{th} observation of the independent variables, $\beta_0, \dots, \beta_k$ are the regression coefficients, ε_i is the i^{th} observation of the stochastic error term.

Accordingly, to test the effect of financial risk on insurance companies' performance, the researcher estimated a linear regression model in the following form.

$$ROA_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 LR_{it} + \beta_3 RIR_{it} + \beta_4 SR_{it} + \beta_5 TPR_{it} + \beta_6 UR_{it} + \varepsilon$$

Source: developed by researcher mainly based on Arif et al., (2015) and NBE (2010)

Where:

ROA= Return on asset;

CR= Credit risk

LR= Liquidity risk

RIR= Reinsurance risk

SR= Solvency risk

TPR= Technical provision risk

UR = Underwriting risk

ε = is the error component for company i at time t assumed to have mean zero $E[\varepsilon_{it}] = 0$

β_0 = Constant

$\beta = 1, 2, 3 \dots 6$ are parameters to be estimate;

i = Insurance company $i = 1 \dots 8$; and t = the index of time periods and $t = 1 \dots 16$

3.8 Variables description and Hypothesis development

According to Creswell (2009), to make it is clear to readers what groups are receiving the experimental treatment and what outcomes are being measured, the variables need to be specified in quantitative researches.

Thus, this section explained the variables used as dependent and independent (explanatory) variables in the study. The definitions and measurements that are used for these variables are described as follows. In addition to this, hypothesis is also developed derived from previous empirical evidences.

Dependent variable

Return on Asset (ROA)

The study employed return on assets to measure performance of insurance companies. According to Daniel et al. (2013) mentioned that return on total assets (ROA) is calculated as net profit before tax by total assets. This is probably the most important single ratio in comparing the efficiency and financial performance of insurance companies as it indicates the returns generated from the assets that Insurers owns. In addition, as stated by Ana-Maria et al. (2014), the return on total assets ratio represents one of the most used methods of quantifying financial performance. It was developed in 1919 by Dupont and it emphasizes the company's ability to efficiently use its assets. As indicated by Mirie (2015), financial performance is a measure of an organization's earnings, profits, appreciations in value as evidenced by the rise in the entity's share price.

As explained by Amal (2012) return on assets determines an organization's ability to make use of its assets and return on equity reveals what return investors take for their investments. The advantages of financial measures are the easiness of calculation and that definitions are agreed worldwide. Accordingly, in most previous studies on insurance sector, return on asset (ROA) is being used as a proxy of performance (Arif et al., 2015; Adrian, 2014; Yuvaraj et al., 2013 and Mirie, 2015). Thus, the study has taken return on asset (ROA) as dependent variable to measure performance of Ethiopian insurance companies.

Independent Variables

This subsection described the independent variables that are used in the econometric model to estimate the dependent variable. To measure the effect of financial risk variables on insurance companies' performance in Ethiopia, six measures are used as independent variables which are extracted from different studies. The variables namely; credit risk, liquidity risk, reinsurance risk, solvency risk, technical provisions risk and underwriting risk.

Credit risk

It is measured using the ratio of premium debtors plus due from reinsurer and other receivable to net asset of insurance company (premium debtors + due from reinsurer + other receivable / net asset). Currently, Ethiopian insurance companies have employed this ratio to grading their credit risk NBE (2010). In accordance with NBE (2010), area of credit risk includes counter party risk on derivative contracts and the risk of default on insured debts and trade debtors.

Gerald et al. (2001) mentioned that credit risk basically means the risks that counterparty cannot meet its liabilities. In addition, as stated by Anthony et al. (1997) it is the risk that a borrower will not perform in accordance with its obligations. Credit risk may arise from either an inability or unwillingness on the part of the borrower to perform in the pre-committed contracted manner. In line with this, prior studies indicated that credit risk has negative and significant effect on performance (Eneyew, 2013; Anas et al., 2014 and Jamal et al., 2014). Thus, the study hypothesizes credit risk as negative and statistically significant effect on performance.

H1: Credit risk has negative and statistically significant effect on Ethiopia insurance companies' performance.

Liquidity risk

According to Anas et al. (2014) liquidity risk arises if the maturities of the two sides of balance sheet are different. This difference could be due to excessive cash or lack of cash that is needed to be financed. As per Amal (2012), liquidity risk measured through current asset over current liabilities that refer to the degree to which debt obligations coming due in the next 12 months can be paid from cash or assets that will be turned into cash. In addition to this, Jamal et al (2014) defined liquidity risk as risk stemming from the lack of marketability of an investment that cannot be bought or sold quickly enough to prevent or minimize a loss. It is the risk that a given security or asset cannot be traded quickly enough in the market to prevent a loss (or make the required profit).

The risk of illiquidity increases if principal and interest cash flows related to assets, liabilities and off-balance sheet items are mismatched (NBE, 2010). Rely on Emine (2015) explanation, liquidity risk arise while there is a lack to pay liabilities, which include operating expenses and payment for losses/benefits under insurance policies, when due. In accordance with Amoah et al. (2010), sufficient liquidity allows an institution to meet its obligation as they come due. The inability to accommodate an increased in funding sources (i.e. deposits or borrowings), make the institution very risky as well as inability to meet margin calls, which in the long-run clients loose trust in the institution. In connection with this, previous researcher has used liquidity risk variable for their study (Arif et al., 2015; Amal, 2012 and Suheyli, 2015). As indentified by (Adrian (2014); Eneyew (2013); Abate (2012) and Emine (2015)), liquidity risk has negative and statistical significant effect on performance insurance companies. Hence, the study hypothesizes liquidity risk as negative and statistically significant effect on performance.

H2: Liquidity risk has negative and statistically significant effect on Ethiopia insurance companies' performance.

Reinsurance risk

It is calculated as ratio of premiums ceded in reinsurance to total assets. Insurance companies reinsure a certain amount of the risk underwritten in order to reduce bankruptcy risk in the case of high losses. Although reinsurance improves the stability of the insurance company through risk dispersion, achievement of solvency requirements, risk profile equilibration and growth of the underwriting capacity, it involves a certain cost (Ana-Maria et al., 2014). As per NBE (2010), insurance companies purchase reinsurance to provide financial security, to increase their own capacity to underwrite insurance business, and to stabilize their underwriting results. Adherence to sound reinsurance risk management policies and procedures go hand in hand with financial soundness. Failure to adhere to such policies and procedures may lead to an increased risk level assessment. The major risks that arise from weakness in a company's reinsurance risk management program are the impairment of capital or liquidity.

Ana-Maria et al. (2014) adopted this variable to study determinants of financial performance in Romanian insurance companies. Besides, prior empirical studies had employed reinsurance risk variable in order to see the effect on profit of insurance companies and made analysis that it had a negative and insignificant effect on return on asset (Mistre, 2015) and (Suheyli, 2015). However, Shiu (2004) find out that it has negative and significant association with performance of insurance companies. In addition, due to their limited capacity and the volatile nature of their business, most general insurers rely heavily on reinsurance, in order to avoid catastrophic losses and reduce the net drain on surplus, by passing on a portion of any risk too large to handle. Nevertheless, it should be noted that there is a cost for reinsurance (Shiu, 2004). Hence, reinsurance dependency increases cost for insurance companies which decrease the performance of insurance companies. Thus, the researcher hypothesizes reinsurance risk as negative and statistically significant effect on performance.

H3: Reinsurance risk has negative and statistically significant effect on Ethiopia insurance companies' performance.

Solvency risk

It is calculated as ratio of total liabilities to total assets and represented that when there is inability existed for a company to meet its long-term fixed expenses and to accomplish long term expansion and growth (Sommer, 1996). Solvency risk is about a company's inability to meet its financial obligations. A company is said to be solvent if it can meet its obligations and insolvent if it cannot.

As per Elmehdi (2014), solvency risk occurred while there is inability of a financial institution to meet its short, middle and long term financial obligations and also defined as the inability of a financial institution to meet its obligations in the event of cessation of activity or liquidation. As defined by AARDLB (2010), solvency risk is come up when there is no enough value in the form of assets in your business to cover all of the liabilities of the business.

Previous researcher has used solvency risk variable to examine the relationship between financial risk and financial performance and discussed that it had a negative effect on return on asset (ROA) (Adrian, 2014) and (Arif et al., 2015). Relay on these empirical evidences, the study hypothesizes solvency risk as negative and statistically significant effect on performance.

H4: Solvency risk has negative and statistically significant effect on Ethiopia insurance companies' performance.

Technical provisions risk

It is measured by safety ratio (claims outstanding to equity ratio) and defined as a risk of holding insufficient technical provisions or holding unjustifiably excessive provisions. Technical provision risk is that the company's liability to policyholders could be understated. Clearly from the perspective of financial safety and soundness, the concern is with possible understatement of liability because any such understatement can result in the insurer being unable to discharge all of its obligations to the public (NBE, 2010).

Additionally, as referred by Jasmina (2003) it is a risk of holding insufficient technical provisions or holding unjustifiably excessive provisions, where provisions are set at a lower level than actually required then this could present the company's financial position in a better light than it actually is. This could result in inappropriate underwriting decisions being made. As per Giovanni (2001) explanation, technical provision risk concerns the impossibility on the part of the companies to meet their commitments towards the insured and the claimants due to insufficient technical provisions.

Suheyli (2015) had applied this variable as one determinant of insurance companies profit and made an analysis that it had negative and statistically significant effect on return on asset. As a result, the researcher also applied this variable with it and hypothesizes technical provision risk as negative and statistically significant effect on performance.

H5: Technical provision risk has negative and statistically significant effect on Ethiopia insurance companies' performance.

Underwriting risk

It is measured through the losses (claims) incurred divided by premium earned and indicates that underwriting risk emphasizes the efficiency of the insurers underwriting activity and also reflects the adequacy or otherwise of insurers' underwriting performance (Adams, et al. 2003). As per Fama et al. (1983) argued that organizations that engage in risky activities are likely to have more volatile cash flows than entities whose management is more averse to risk taking. Therefore, a negative connection between the underwriting risk and the insurers' financial performance is expected, since taking an excessive underwriting risk can affect the company's stability through higher expenses.

According to Andreas et al. (2014), underwriting risk may be primarily generated from the inadequacy of the premiums in the form of underestimation of the premiums or insufficient diversification of insurance portfolio. Underwriting risk which is present at the time the policy is issued and before the insured event occurs. That is a risk that the costs and claims will be higher than the premiums received. When calculating the sufficient premium it may happen that the calculated premium is insufficient for the underwritten risks.

It is a risk that the insurer will not raise sufficient revenues from premiums to cover claims or sum insured, that represents a significant risk for the insurance company. If the contracted premium is undervalued, it means that at the time of claims liquidation paid premiums will be lower, and the insurer will face a loss on a particular insured event. The other extreme is overrated premium, and also the risk whereupon the insured pays a higher price than the actual value. In this case, the insurance company is uncompetitive in the market due to excessive premiums thereby reducing portfolio and the number of insured (Andreas, et al 2014).

As per Arif et al. (2015) employed underwriting risk as variable of financial risks and its measurement to examine the effect on financial performance. Similarly, according to Ana-Maria et al. (2014) underwriting risk emphasizes the efficiency of the insurer's underwriting activity and the study used the same measurement. As the result, underwriting risk has a negative influence on the insurer's financial performance, since taking an excessive underwriting risk can affect the company's stability through higher expenses. Furthermore, Ijaz (2015) studies demonstrated that underwriting risk has a negative and statistically significant effect on return on total assets ratio in insurance companies. Moreover, Suheyli (2015) used underwriting risk variable as measured losses (claims) incurred divided by premium earned and find out that underwriting risk has statistically significant and negative relationship with return on asset.

Previous studies of (Ana-Maria et al. (2014); Ijaz (2015); Hifza (2011); Emine (2015); Daniel et al. (2013); Hadush (2015); Meaza (2014); Mistre (2015) and Suheyli (2015)). They concluded that underwriting risk has a negative and statistically significant influence on insurer's performance. Relay on these evidences, the researcher used this variable and hypothesizes underwriting risk as negative and statistically significant effect on performance.

H6: Underwriting risk has negative and statistically significant effect on Ethiopia insurance companies' performance.

3.9 Operationalization of study variables

The following table presented the summary of variables, their measurement and expected sign for the effect of financial risk (independent variables) on insurance performance (dependent variable).

Table 3.1 Description of variables and their expected relationship

	<i>Variables</i>	<i>Measure</i>	<i>Notation</i>	<i>Expected sign</i>
<i>Dependent Variable</i>	Firms' performance	Net profit before tax/total assets	ROA	
<i>Independent Variables</i>	Credit risk	Premium debtors + Due from reinsurer + Other receivable / Net asset	CR	-
	Liquidity risk	Current Assets / Current Liabilities	LR	-
	Reinsurance risk	Premium ceded/Total asset	RIR	-
	Solvency risk	Total liabilities /Total asset	SR	-
	Technical provisions risk	Claims outstanding / Total equity	TPR	-
	Underwriting risk	Loss or Claim incurred / Premium earned	UR	-

Source: Compiled by the researcher mainly based on Arif et al., (2015) and NBE (2010)

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

This chapter deals with the results and analysis of the findings and it contains three sections. The first section presented descriptive and correlation analysis on variables of the study; the second section presented fulfillment of the classical linear regression model (CLRM) assumptions; the third section laid down the results of regression and interview analysis that constitute the main findings of this study.

4.1 Descriptive statistics

Table 4.1 provides a summary of the descriptive statistics of the dependent and independent variables for eight insurance companies from the year 2000 to 2015 with a total of 128 observations. The table shows the mean, minimum, maximum, standard deviation and number of observations for the dependent variable firms' performance (ROA) and independent variables (credit risk, liquidity risk, reinsurance risk, solvency risk, technical provisions risk and underwriting risk).

Table 4.1 Descriptive statistics

	ROA	CR	LR	RIR	SR	TPR	UR
Mean	0.082242	0.697342	1.207251	0.134608	0.61125	0.760534	0.659624
Maximum	0.393986	1.865895	2.604086	0.62	0.87459	4.039901	1.287724
Minimum	-0.047559	0.059445	0.390906	0.03	0.335	0.100211	0.203299
Std. Dev.	0.054465	0.364566	0.442743	0.071803	0.092652	0.707319	0.159078
Observations	128	128	128	128	128	128	128

Source: - annual report of sample insurance computed using E-views 8

Table 4.1 presents a summary of the descriptive statistics of the dependent and independent variables for eight insurance companies for a period of sixteen(16) years from 2000-2015 with a total of 128 observations. Key figures, including mean, maximum, minimum and standard deviation value were reported.

As indicated in the above table, the firms' performance measured by return on asset shows that sampled of Ethiopian insurance companies achieved 8.22% on average before tax profit over the last sixteen years from 2000 to 2015. From the total sample, return on asset had a maximum of 39.39% and minimum of -4.75%. It means that the most profitable insurance company among the sampled earned 39.39 cents of profit before tax for a single birr (1.00) invested in the assets of the firm. On the other hand, not profitable insurance company of the sampled lost -4.75 cents of profit before tax for each birr (1.00) invested in the assets of the firm and the value of return on asset deviate from its mean by 5.44%.

The average value for credit risk as measured by ratio premium debtors plus due from reinsurer and other receivable to net asset of insurance company was 69.73% with a maximum of 186.58% and a minimum of 5.94%. It means that the average rate of credit risk was 69.73% which is more than the standard rate of national bank of Ethiopia NBE (2010) which is 50%. It implies that there is large amount of uncollectable balance which tends to have default risk. In addition, sampled of Ethiopian insurance companies who have less uncollected amount has 5.94 cents from the total receivable birr (1.00) in the firm which is below the standard rate. On the other hand, sampled of Ethiopian insurance companies who have excess uncollected amount has 1 birr and 0.86 cents from the total receivable birr (1.00) which is above the standard rate and the value of credit risk deviate from its mean by 36.45%.

The average value of the liquidity risk measured by current ratio was 120.72%. The average value indicates that for each one birr current liability, there was 1.20 birr current asset to meet obligation which is more than the standard rate of national bank of Ethiopia NBE (2010) which is 105% and indicates that there is excess cash holding by the insurance companies. The maximum and minimum values were 260.40% and 39.09% respectively for the study period.

It means that the most liquid Ethiopian insurance company has 2.6 birr to meet obligation which is more than the standard rate. However, Ethiopian insurance companies who have less liquid have 39.67 cents to meet obligation which is less than the standard rate and the value of liquidity risk deviate from its mean by 44.27%.

The outputs of the descriptive statistics indicate that the mean of reinsurance risk as proxy by premium ceded to total asset was 13.46%. This means that on average 13.46% of gross premium collected as percentage of total asset was ceded to reinsurance which is below the standard rate of national bank of Ethiopia (NBE, 2010) which is 30% that implies most of sampled Ethiopian insurance companies have less reinsurance dependency. The maximum value of premium ceded to total asset ratio was 62% which is above the standard rate and a minimum value of 3% that is below the standard rate and the value of reinsurance risk deviate from its mean by 7.18%.

The average value of the solvency risk measured by total liabilities over total assets was 61.12%. It implies that there is 1 birr total assets to cover 61.12 cents of liabilities. The maximum and minimum values were 87.45% and 33.5% respectively for the study period. As regards the standard deviation, the value of solvency risk deviate from its mean by 9.26%.

The outputs of the descriptive statistics indicate that the mean of technical provisions risk as proxy by claims outstanding to net asset was 76.05%. It refers that there is 1 birr of net asset to meet 76.05 cents of claims outstanding. The maximum value of claims outstanding to net asset ratio was 403.99% and a minimum value of 10.02% respectively for the study period. It indicates that the highest claim outstanding to equity for a company in a particular year was 403.99% which is far from the maximum standard of 250% NBE (2010) and indicates that there is technical provisions risk. With regard to the standard deviation, the value of technical provisions risk deviate from its mean by 70.73%.

Finally, underwriting risk variable, as proxies by losses incurred divided by annual premium earned; the mean of incurred claims to earned premium ratio was 65.96%. This implies that on average, most insurance companies from the sample paid 65.96% loss incurred out of the total premium earned per year which was below as compared with acceptable standard of around 70% (NBE, 2010).

The highest ratio of losses incurred to earned premium value was 128.77% which is above the standard rate that shows that there is underwriting risk, but the minimum value for a company in a particular year was 20.33% which is below the standard rate. With respect to standard deviations, the ratio of losses incurred to earned premium deviate from its mean by 15.91%.

4.2 Correlation Analysis

Correlation measures the degree of linear association between variables. Values of the correlation coefficient are always ranged between +1 and -1. A correlation coefficient of +1 indicates that the existence of a perfect positive association between the two variables, while a correlation coefficient of -1 indicates perfect negative association. A correlation coefficient of zero, on the other hand, indicates the absence of relationship (association) between two variables (Brooks, 2008). The table below shows the correlation matrix among dependent and independent variables.

Table 4.2 Correlation Analysis of Variables

	ROA	CR	LR	RIR	SR	TPR	UR
ROA	1						
CR	-0.334	1					
LR	-0.153	-0.095	1				
RIR	0.062	-0.020	0.032	1			
SR	-0.117	0.393	-0.609	0.151	1		
TPR	-0.211	0.058	-0.147	-0.043	0.171	1	
UR	-0.395	0.234	-0.285	-0.002	0.392	0.199	1

Source: - annual report of sample insurance computed using E-views 8

The correlation result in Table 4.2 shows credit risk, liquidity risk, solvency risk, technical provisions risk and underwriting risk have negative correlation with return on asset for measurement of Ethiopian insurance companies' performance. It refers that when these risks increases, performance of Ethiopian insurance companies will be go down. However, reinsurance risk has positive correlation with return on asset which indicates that while reinsurance risk decreases, at the same time performance of Ethiopian insurance companies will be decrease.

The coefficient estimates of correlation in the above table shows -0.334859, -0.153063, -0.117243, -0.21136 and -0.395567 for credit risk, liquidity risk, solvency risk, technical provisions risk and underwriting risk respectively. This implies that credit risks, liquidity risk, solvency risk, technical provisions risk, underwriting risk are highly negatively correlated with return on asset. However, reinsurance risk has 0.062208 coefficient number which is lower estimate of positive correlation contrast to the above variables.

4.3 Regression model tests

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

4.3.1 Model Selection (Random Effect versus Fixed Effect Models)

As Brooks (2008) referring on his book, there are broadly two classes of panel estimator approaches that can be employed in financial research: fixed effects models and random effects models. The choice between both approaches is done by running a Hausman test. To conduct 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 cross section aren't greater than the number of coefficients to be estimated so it is not possible to conduct a Hausman test. Therefore a fixed cross-sectional effect is specified in the estimation so as to capture unobserved idiosyncratic effects of different insurance companies. Thus, to determine whether the fixed effects are necessary or not this study run the Hausman specification test as recommended by Brooks (2008) and others. The hypothesis for the model selection test was formulated as follow;

H_0 : Random effects model is appropriate.

H_1 : Fixed effects model is appropriate.

$\alpha = 0.05$

Decision Rule: Reject H_0 if P value is less than significant level 0.05. Otherwise, do not reject H_0 .

Table 4. 3 Hausman Test

Correlated Random Effects - Hausman Test

Equation: HANSUMTEST

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	13.697428	6	0.0332

Source: - annual report of sample insurance computed using E-views 8

The Hausman model selection test for this study has a p-value of 0.0332 for the regression models. Thus, the null hypothesis which is random effect model appropriate was rejected and the research used the fixed effect model.

In addition, as stated by 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 fixed effect model and random effect model. Hence the choice here is based on computational convenience. On this score, fixed effect model may be preferable. Therefore, the study has 16 time series and 8 cross sectional which is relevant to fixed effect model.

According to Brooks (2008) it is often said that the random effects model is more appropriate when the entities in the sample can be thought of as having been randomly selected from the population, but a fixed effect model is more reasonable when the entities in the sample effectively represent the entire population. Thus, the sample for this study was not selected randomly instead it selected rationally that can effectively represent the total number of population, due to this it is appropriate for fixed effect model selection.

4.3.2 Tests for the Classical Linear Regression Model (CLRM) assumptions

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

I. The errors have zero mean ($E(u_t) = 0$)

This part shows the test for the assumptions of classical linear regression model (CLRM) namely the error have zero mean, heteroscedasticity, autocorrelation, normality and multicollinearity.

Relay on Brooks (2008), the first assumption required is that the average value of the errors is zero. In fact, if a constant term is included in the regression equation, this assumption will never be violated. Hence, study's regression model has included a constant term, so that this assumption was not violated.

II. Test for heteroskedasticity assumption($\text{var}(u_t) = \sigma^2 < \infty$)

As indicated by Brooks (2008), this assumption requires that the variance of the errors to be constant. If the errors do not have a constant variance, it is said that the assumption of homoscedasticity has been violated. This violation is termed as heteroscedasticity. In this study test was used to test for existence of heteroscedasticity across the range of explanatory variables.

H_0 : The variance of the error is homoscedasticity

H_1 : The variance of the error is heteroscedasticity

Table 4.4 Heteroskedasticity Test

Heteroskedasticity Test: White

F-statistic	1.309162	Prob. F(9,117)	0.2395
Obs*R-squared	11.61938	Prob. Chi-Square(9)	0.2356
Scaled explained SS	9.107850	Prob. Chi-Square(9)	0.4274

Source: - *annual report of sample insurance computed using E-views 8*

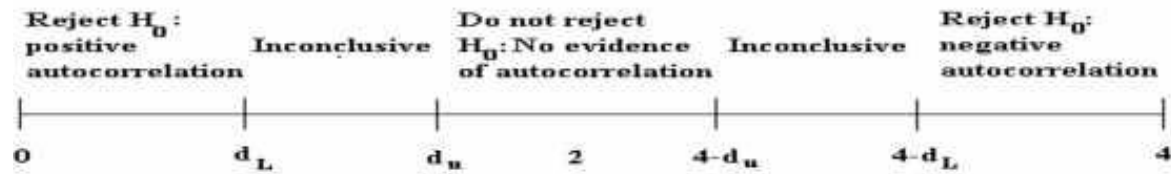
In this case, both the F- statistic and R-squared versions of the test statistic give the same conclusion that there is no evidence for the presence of heteroscedasticity, since the p-values are considerably in excess of 0.05 and also the third version of the test statistic, ‘Scaled explained SS’, which as the name suggests is based on a normalised version of the explained sum of squares from the auxiliary regression, suggests also that there is no evidence of heteroscedasticity. Thus, the conclusion of the test has shown that no evidence of heteroscedasticity and the null hypothesis is accepted.

III. Test for autocorrelation assumption ($\text{cov}(u_i, u_j) = 0$ for $i \neq j$)

This assumption stated that the covariance between the error terms over time (or cross sectionals, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are auto correlated or that they are serially correlated (Brooks, 2008).

The study used both Durbin-Watson (DW) and Breusch-Godfrey test for the existence of autocorrelation. In addition, lagged value of a variable (ROA (-1)) is used in this research in order to adjust the autocorrelation. As per Brooks (2008) lagged the value is simply the value that the variable took during a previous period. So from the regression result DW is 1.873 it is closed to two.

Table 4.5 Rejection and non-rejection regions for Durbin-Watson Test



0	$d_L = 1.651$		$d_U = 1.817$	1.873	$4-d_U = 2.183$	$4-d_L = 2.349$	4
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Source: - annual report of sample insurance computed using E-views 8

Therefore, to test for autocorrelation, the DW test critical values were used. Then, relevant critical lower and upper values for the test are $d_L = 1.651$ and $d_U = 1.817$ respectively. The values of $4 - d_U = 4 - 1.817 = 2.183$; $4 - d_L = 4 - 1.651 = 2.349$.

The Durbin-Watson test statistic of 1.873 is clearly found on the non rejection region so that there is no evidence for the presence of autocorrelation.

Another test for the existence of autocorrelation is by using Breusch-Godfrey test.

H_0 : The errors are uncorrelated with one another

H_1 : The errors are correlated with one another

Table 4.6 Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.353084	Prob. F(2,115)	0.2625
Obs*R-squared	2.919842	Prob. Chi-Square(2)	0.2323

Source: - annual report of sample insurance computed using E-views 8

Both versions of the test; F- statistic and R-squared version of the test indicate that the null hypothesis of no autocorrelation should not be rejected, since the p-values are considerably in excess of 0.05. The conclusion from both versions of the test described that the null hypothesis of no autocorrelation is not rejected.

IV. Test of normality ($u_t \sim N(0, \sigma^2)$)

As stated by Brooks (2008), if the residuals are normally distributed, the histogram should be bell-shaped and the Bera-Jarque statistic would be significant. This means that Jarque Bera formalizes this by testing the residuals for normality and testing whether the coefficient of skewness and kurtosis are ≈ 0 and ≈ 3 respectively. Normality assumption of the regression model can be tested with the Jarque- Bera measure. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how it is fat the tails of the distribution. If the Jarque Bera value is greater than 0.05, it's an indicator for the presence of normality (Brooks, 2008).

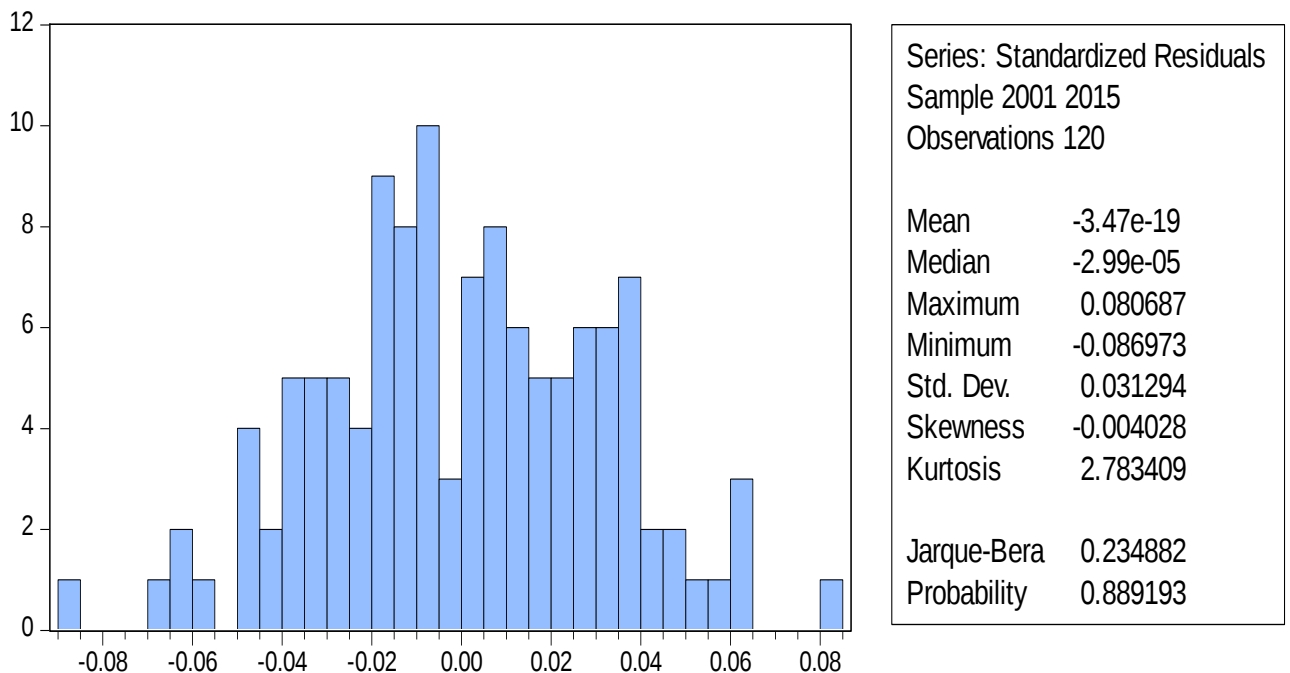
In addition, it is quite often the case that one or two very extreme residuals cause a rejection of the normality assumption. Such observations would appear in the tails of the distribution, which enters into the definition of kurtosis, to be very large. Such observations that do not fit in with the pattern of the remainder of the data are known as outliers. If this is the case, one way to improve the chances of error normality is to use dummy variables (Brooks, 2008). In line with this, the study included two dummy variables (D411 and D415) to adjust the normality distribution. Thus, the figure below shows the result of normality by including two dummy variables.

The hypothesis for the normality test was formulated as follow:

H_0 : Error term is normally distributed

H_1 : Error term is not normally distributed

Figure 4.1 Normality Test Result



Source: - annual report of sample insurance computed using E-views 8

The above diagram witnesses that normality assumption holds, i.e., the coefficient of kurtosis was close to 3, skewness was zero and the Bera-Jarque statistic has a P-value of 0.889 implying that the data were consistent with a normal distribution assumption. Based on the statistical result, the study failed to reject the null hypothesis of normality at the 5% significance level.

V. Test for multicollinearity

As referred by Brooks (2008), an implicit assumption that is made when using the OLS estimation method is that the explanatory variables are not correlated with one another. If there is no relationship between the explanatory variables, they would be said to be orthogonal to one another. However, a problem occurs when the explanatory variables are very highly correlated with each other, and this problem is known as multicollinearity.

Malhotra (2007) stated that multicollinearity problems exists when the correlation coefficient among explanatory variables should be greater than 0.75. However, Brooks (2008) mentioned that if the correlation coefficient along with the independent variables is 0.8 and above, multicollinearity problems will be existed.

Table 4.7 Correlation Matrix between independent variables

	CR	LR	RIR	SR	TPR	UR
CR	1					
LR	-0.0958	1				
RIR	-0.0207	0.03239	1			
SR	0.39397	-0.6096	0.15198	1		
TPR	0.05891	-0.147	-0.0434	0.17123	1	
UR	0.2342	-0.2851	-0.0022	0.39221	0.19952	1

Source: - annual report of sample insurance computed using E-views 8

The method used in this study to test the existence of multicollinearity was by checking the Pearson correlation between the independent variables. The correlations between the independent variables are shown in table 4.7 above. All correlation results are below 0.75, which indicates that multicollinearity is not a problem for this study.

VI. Model Specification test

According to Brooks (2008), further implicit assumption of the classical linear regression model is that the appropriate ‘functional form’ is linear. This means that the appropriate model is assumed to be linear in the parameters and that in the bivariate case, the relationship between dependent and independent can be represented by a straight line. Model specification error occurs when omitting a relevant independent variable and including unnecessary variable.

Therefore, in order to select a correct estimated model, the researcher had carry out the Ramsey-RESET Test to check on the model specification. The hypothesis for the model specification test was formulated as follow;

H₀: The model specification is correct.

H₁: The model specification is incorrect.

Table 4.8 Result of model specification Test: Ramsey-RESET test

Ramsey RESET Test

Equation: RAMSEYTEST

Specification: ROA C CR LR RIR SR TPR UR

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.724747	120	0.4700
F-statistic	0.525259	(1, 120)	0.4700
Likelihood ratio	0.559054	1	0.4546

Source: - *annual report of sample insurance computed using E-views 8*

From table 4.6, it can be concluded that this research do not reject null hypothesis (H₀), since the p value of f statistic is 0.47, which is greater than significance level of 0.05. Thus, it can be concluded that the model specification is correct from year 2000 to 2015. Overall reliability and validity of the model was enhanced further by the Prob (F-statistic) value of 0.000000.

4.4 Analysis of regression and interview result

This section presents the empirical findings from the econometric output and interview results on effect of financial risk on insurance companies' performance in Ethiopia. Table 4.9 below reports regression results between the dependent variable (ROA) and explanatory variables. Under the following regression outputs the beta coefficient may be negative or positive; beta indicates that each variable's level of influence on the dependent variable.

Regression result

Empirical model: the empirical model used in the study in order to indentify the effect of financial risk on insurance companies performance:-

$$ROA_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 LR_{it} + \beta_3 RIR_{it} + \beta_4 SR_{it} + \beta_5 TPR_{it} + \beta_6 UR_{it} + \varepsilon$$

Source: developed by researcher mainly based on Arif et al., (2015) and NBE (2010)

Table 4. 9 Regression result

Dependent Variable: ROA

Method: Panel Least Squares

Date: 12/18/16 Time: 05:16

Sample (adjusted): 2001 2015

Periods included: 15

Cross-sections included: 8

Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.274075	0.043815	6.255257	0.0000
CR	-0.038443	0.013108	-2.932696	0.0041**
LR	-0.043960	0.009785	-4.492776	0.0000**
RIR	0.060365	0.049188	1.227242	0.2225
SR	-0.132884	0.061362	-2.165570	0.0327*
TPR	-0.018131	0.005641	-3.214482	0.0017**
UR	-0.078233	0.024216	-3.230663	0.0017**
ROA(-1)	0.267479	0.074336	3.598267	0.0005
D415	0.290458	0.036770	7.899223	0.0000
D411	0.112245	0.035800	3.135312	0.0022

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.670935	Mean dependent var	0.079476
Adjusted R-squared	0.619818	S.D. dependent var	0.054553
S.E. of regression	0.033637	Akaike info criterion	-3.815821
Sum squared resid	0.116538	Schwarz criterion	-3.420926
Log likelihood	245.9493	Hannan-Quinn criter.	-3.655453
F-statistic	13.12550	Durbin-Watson stat	1.873008
Prob(F-statistic)	0.000000		

Source: - annual report of sample insurance computed using E-views 8

N.B:- **and * indicate that significant at 1% and 5% significance level respectively.

Thus, based on the result in above Table, the following model was developed to examine the effect of financial risk on insurance performance.

$$ROA = 0.274075 - 0.038443CR - 0.043960LR + 0.060365RIR - 0.132884SR - 0.018131TPR - 0.078233UR + \varepsilon$$

This section discusses in detail the analysis of the results for each explanatory variable and their effect on Ethiopian insurance companies' performance. Furthermore, the discussion analyzed the statistical findings of the study in relation to the previous empirical evidences. Hence, the following discussions present the interpretation on the fixed effects model regression results.

P-value indicates at what percentage or precession level of each variable is significant except reinsurance risk. The R-squared value measures how well the regression model explains the actual variations in the dependent variable (Brooks, 2008). R-squared statistics and the adjusted- R squared statistics of the model was 67.09% and 61.98% respectively. The adjusted R^2 value 61.98% indicates that the dependent variable of return on asset (ROA) of Ethiopian insurance companies is well explained by the independent variables that are listed in the model. Thus, these variables collectively are good explanatory variables to identify the effect of financial risks on insurance companies' performance in Ethiopia. The regression F-statistic (13.12550) and the p-value of zero attached to the test statistic reveal that the null hypothesis that all of the coefficients are jointly zero should be rejected. Thus, it implies that the independent variables in the model were able to explain variations in the dependent variable. The coefficient for CR is -0.038443 on ROA which indicates that the credit risk of the insurances had negative relationship with ROA and also the relationship is significant at 1% level of significant. And also, the coefficient for LR is -0.043960 on ROA which refers that liquidity risk had negative and significant relation with ROA at 1% level of significant. Next to this, the coefficient for solvency risk is -0.132884 on ROA which refers that solvency risk had negative and significant relation with ROA at 5% level of significant. Finally, technical provisions risk and underwriting risk with coefficient of -0.018131 and -0.078233 had negative and significant relation with ROA at 1% level of significant respectively.

However, reinsurance risk is 0.060365 on ROA which implies that reinsurance risk had positive relation with ROA but it is insignificant at 5% level of significant. The negative relationships indicate that there is an inverse relationship between the five independent variables and ROA. Thus, increasing of those variables will lead to a decrease in ROA of Ethiopian insurance companies. On the other hand the positive relationships indicate that there is a direct relationship between the remaining one independent variables and ROA. Decreasing of this variable will led to a decline in ROA Ethiopian insurance companies.

Interview result

In supplement to the structured review of financial records, this study employed unstructured in-depth interviews. In depth interviews were conducted with eight sampled Ethiopian insurance companies' managers of finance and risk departments and two senior officers of national bank of Ethiopia (NBE) insurance supervision department.

Table 4.10 Interviewees' detail descriptions

<i>No.</i>	<i>Institutions</i>	<i>Number of interviewees' in person</i>	<i>Department</i>	<i>Job title</i>
1	Ethiopian insurance corporation	1	Risk	Manager
2	Awash insurance S.C	1	Risk	Manager
3	Africa insurance S.C	1	Risk	Manager
4	National insurance company of Ethiopia S.C	1	Risk	Manager
5	Nayal insurance S.C	1	Finance	Manager
6	Nile insurance S.C	1	Finance	Manager
7	Untied insurance S.C	1	Finance	Manager
8	Global insurance S.c	1	Finance	Manager
9	National bank of Ethiopia	2	Insurance supervision	Senior officers
	Total	10		

Source: Compiled by the researcher

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 insurance companies' performance in general. More specifically, the interview questions were also tried to identify how those risks can influence performance, the major determining factors that can affect insurers' performance among the financial risk determinants, measures taken by the insurance to reduce the negative effect on their performance and included also their general opinion regarding the matter.

According to interview conducted from risk, finance and NBE insurance supervision department, underwriting risk, liquidity risk, solvency risk, technical provisions risk and credit risk were found to be the major risks that negatively affected performance of Ethiopian insurance companies over the sampled period. Among all the risks mentioned above, all the interviewees agreed that liquidity, solvency risk and underwriting risk were the most significant financial risk that negatively affects the performance of Ethiopian insurance companies.

The interviewees mentioned that liquidity risk is the first major financial risk that can negatively affect the performance of Ethiopian insurance companies. Hence, handling of liquidity risk is the major task to ensure the availability of sufficient funds to meet obligation of claimants.

The interviewees also suggested that underwriting risk is also the most significant risk next to liquidity risk that faced Ethiopian insurances companies and the success of their business depends on accurate measurement and efficient management of this risk to a greater extent than any other risk. Next to this, solvency risk, technical provisions risk and credit risk are also significant risks that negatively affect Ethiopian insurance companies' performance respectively. All the interviewees agreed that the abovementioned financial risks have an inverse relationship with performance of Ethiopian insurance companies. However, the respondent mentioned that reinsurance risk hasn't significant effect on Ethiopian insurance companies' performance.

4.4.1 Discussion of Regression and interview Result

Credit risk

H1: Credit risk has negative and statistically significant effect on Ethiopia insurance companies' performance.

According to the regression result of credit risk (CR) has a negative relationship with Ethiopian insurance companies' performance by a coefficient estimate of -0.038443. This means that holding other independent variables constant and when one percent increases in credit risk, consequently it reduces return on asset (ROA) of Ethiopian insurance companies by 3.84% and the p value of credit risk (CR) is 0.0041 reveals that it is statistically significant at 1% level of significance. Accordingly, the result supports the working hypothesis that credit risk has negative and statistically significant effect on performance of insurance companies in Ethiopia for the period of 2000 to 2015. Thus, this outcome is consistent with prior study of Jamal et al. (2014) that point out the negative significant effect of credit risk on performance.

As implied from the above finding, credit risk is adversely affecting the performance of the insurance companies during the study period in Ethiopia. Hence, the possible reason is associated with the sales of premium on credit bases to the customers who is likely fail to pay their debt to the insurance companies on due date. As the sale on credit of the premium increase their profitability decline significantly. Additionally, not tracking uncollectable who past due and aged plays their fair share in adversely affecting the profitability of the insurance companies. Accordingly, the inability of the reinsurers to pay the claimed amount is increasing significantly as indicated on the financial statement of Ethiopian insurance companies. Hence, the payment requests by Ethiopian insurance companies usually are significant and may to the extent jeopardize insurance companies to considerable credit risk if not received promptly.

As per the interview conducted, the key informants indicate that NBE proclamation (746/2012) credit sale of premium is permitted to government backed institutions such as federal and regional bodies only at this time.

Even though, the permission of NBE to provide credit service to government organs meant to decrease the possibility of credit risk, the delay in payment of debt by government organs due to budget constraint as well as lack of advanced receivable management is increasing the outstanding balance of receivables significantly.

Furthermore, the considerable amount of other receivables such as guarantees, customs bond and other loans are trending upwardly. Hence these may create the probability of the insurance companies to encounter credit risk. The effect of credit risk being a financial risk factor in adversely affecting the performance of insurance companies in Ethiopia. Key informants agreed and concerned on the need to remedy regarding the procedures and methods of collection. Furthermore, the selection of reinsurers also need to be stiff than the previous traditional selection method.

Liquidity risk

H2: Liquidity risk has negative and statistically significant effect on Ethiopia insurance companies' performance.

According to the regression result of liquidity risk (LR) has a negative relationship with Ethiopian insurance companies' performance by a coefficient estimate of -0.043960. This means that holding other independent variables constant and when one percent increases in liquidity, consequently it decreases return on asset (ROA) of Ethiopian insurance companies by 4.39% and the p value of LR is 0.0000 shows that it is statistically significant at 1% level of significance. Accordingly, the result supported the working hypothesis that liquidity risk has negative and statistically significant effect on performance of insurance companies in Ethiopia for the period of 2000 to 2015. This finding is consistent with previous studies of Adrian (2014) and Abate (2012) found out liquidity risk is one of the most significant variable that adversely affect the profitability of insurance companies.

On contrary, (Arif et al. (2015); Amal (2012) and Suheyli (2015)) concluded that liquidity risk has a positive and significant association with performance of insurance companies who argue that the more liquid insurance company can get the better they meet their claims.

Meanwhile, (Yuvaraj et al. (2013); Daniel et al. (2013); Mirie (2015); Hadush (2015); Meaza (2014) and Mistre (2015)) concluded that liquidity has no significant impact on the profitability of insurance companies.

The study finding implies that an increase in liquidity, definitely lead to a decrease in performance of Ethiopian insurance companies. It refers that holding of excess cash brings less profitable if the insurance companies don't invested to increase income.

This finding is in line with the expectation and it corroborates finance theory of a negative relationship, which brought about profitability with liquidity trade-off (James et al., 2014). If the insurance companies do not invest sufficient funds in current assets, it may become illiquid and therefore it is risky. Also, with huge investment in current assets, the insurance companies would lose profitability, as idle current assets would result in unbearable opportunity cost. This would be a consequence of the fact that current assets are usually the less profitable than the fixed assets. Thus, insurance companies holding more liquidity could not be more profitable if they couldn't invest their excess of cash in other investment sector.

According to interview result, key informants point out before the consideration of investment there is a need for liquidity risk management regarding the identification, measurement and controlling through stringent projection of cash flow in considering trend of past as well as consideration of future transactions in timing the need and use of liquidity is another possible factor that affect the use of liquidity in Ethiopian insurance companies.

Reinsurance risk

H3: Reinsurance risk has negative and statistically significant effect on Ethiopia insurance companies' performance.

From the regression result of reinsurance risk (RIR) has a positive relationship with Ethiopian insurance companies' performance by a coefficient estimate of 0.060365. This means that keeping other independent variables constant and when one percent increases in reinsurance risk, as a result it enhances return on asset (ROA) of Ethiopian insurance companies by 6.03% and the p value of RIR is 0.2225 reveals that it is statistically insignificant at 5% significance level and the result doesn't supported the workable hypothesis that reinsurance risk has negative and statistically significant effect on performance of insurance companies in Ethiopia for the period of 2000 to 2015. The result is consistent with prior studies of Mistre (2015) and Suheyli (2015). However, it is contradict with Shiu (2004) result that it has negative and statistically significant effect on performance of insurance companies, because low retention limits act as if they were the brokers of reinsurers, because a high proportion of their premiums have to be handed over to reinsurance companies, and to a great extent their performance would depend on that of their reinsurers.

On the other hand, the study finding implies that an increase in reinsurance risk, certainly not lead to a decrease in performance of Ethiopian insurance companies. The possible cause of the result is lack of large risk industries which require the involvement of reinsurers in indemnifying the insurance companies' customers. This is reflected on the economic structure and livelihood of the country as Omer (2016) explained the livelihood and economic composition citing CSA (central statics agency) indicate that 80% of the population are located in rural areas and are primarily engaged in subsistence agriculture still depends upon the vagaries of nature agriculture accounts for 45 percent of the GDP in 2014/15.

Even though, reinsurers buffer insurance companies against huge losses, most of the significant claims have been covered by Ethiopian insurance companies. The infancy of the industries that require reinsurance indemnification due to the unforeseen circumstances is improbable. The losses indemnify by Ethiopian insurance companies most of the time during the study period require less involvement of the reinsurers.

The interview result is consistent with the above finding which confirmed by key informants. Moreover, they indicated that NBE (2010) put a restriction on Ethiopian insurance companies premium ceded amount cannot exceed 30% of the gross premium earned. Due to these reason, reinsurance risk doesn't surface to cause a significant effect on Ethiopian insurance companies' performance.

Solvency risk

H4: Solvency risk has negative and statistically significant effect on Ethiopia insurance companies' performance.

In accordance with the regression result of solvency risk (SR) has a negative relationship with Ethiopian insurance companies' performance by a coefficient estimate of -0.132884. This means that holding other independent variables constant and when one percent increases in solvency risk, as a result it decreases return on asset (ROA) of Ethiopian insurance companies by 13.23% and the p value of SR is 0.0327 discloses that it is statistically significant at 5% level of significance and the result supported the working hypothesis that solvency risk has negative and statistically significant effect on performance of insurance companies in Ethiopia for the period of 2000 to 2015.

The result is consistent with the earlier studies of Arif et al. (2015) and Adrian (2014). This implies that an increase in solvency risk, certainly lead to a decrease in performance of Ethiopian insurance companies. It indicates higher debt to asset ratio, the possibility of the need to find an external funding and therefore performance of the insurance companies affected adversely. Additionally, although the Ethiopian insurance companies require having a reserve of 10% from their net profit according to NBE proclamation (746/2012), the increase in leverage undeniably put insured to have a doubt on insurance companies.

Furthermore, unlike other industries insurance companies with higher debt are relatively more risky because they tend to need more of their assets to meet their obligations. The smaller the equity in relation to liabilities of the company, the lower the ability of the company to absorb unforeseen shocks and the harder it get to repay claimants which subsequently reduces the insurance companies performance.

Assets run of out before all the liabilities have been met, less estimation of the liabilities associated with those policies and lack to increase their net asset are the possible causes for the occurrence of solvency risk.

According to interview result, the key informants stated that when there are more liabilities than assets, un-well capitalized structure is existed and insurances companies would face higher risk of going bankrupt which increase their costs of funding and decline performance of the insurance companies. Finally, they stressed due concern need to be given to capital structure to sustain the growth and going concern of insurance companies.

Technical provisions risk

H5: Technical provision risk has negative and statistically significant effect on Ethiopia insurance companies' performance.

In line with regression result of technical provision risk (TPR) has a negative relationship with Ethiopian insurance companies' performance by a coefficient estimate of -0.018131. This means that holding other independent variables constant at their average value and when one percent increases in technical provision risk, as a result it decreases return on asset (ROA) of Ethiopian insurance companies by 1.8% and the p value of TPR is 0.0017 reveals that it is statistically significant at 1% level of significance.

Consequently, the result supported the working hypothesis that technical provision risk has negative and statistically significant effect on performance of insurance companies in Ethiopia for the period of 2000 to 2015. The finding is consistent with earlier result of Suheyli (2015). This implies that an increase in technical provision risk, certainly lead to a decrease in performance of Ethiopian insurance companies.

It indicates holding insufficient technical provision for outstanding claim decline the insurers' profit. In line with this, understatement liabilities can result in the insurer being unable to discharge all of its obligations to the insured. Thus, if there exists a lack of strong guideline to assess for adequate comprehensive and effective control over outstanding liabilities consecutively leads to decline in profitability of the insurance companies.

According to interview result, technical provision risk is also one of financial risk determinant that can adversely affect performance of Ethiopian insurance companies. The result was confirmed by the key informants as indicate for the need to consider the development and implementation of effective technical provision risk management by the insurance companies.

Underwriting risk

H6: Underwriting risk has negative and statistically significant effect on Ethiopia insurance companies' performance.

According to the regression result of underwriting risk (UR) has a negative relationship with Ethiopian insurance companies' performance by a coefficient estimate of -0.078233. This means that holding other independent variables constant and when one percent increases in underwriting risk, consequently it reduces return on asset (ROA) of Ethiopian insurance companies by 7.82% and the p value of UR is 0.0017 reveals that it is statistically significant at 1% level of significance. Accordingly, the result supported the working hypothesis that underwriting risk has negative and statistically significant effect on performance of insurance companies in Ethiopia for the period of 2000 to 2015.

The study finding is consistent with previous studies of (Ana-Maria et al. (2014); Ijaz (2015); Hifza (2011); Emine (2015); Daniel et al. (2013); Hadush (2015); Meaza (2014); Mistre (2015) and Suheyli (2015). However, Mirie (2015) and Arif et al. (2015)) result showed that underwriting risk had insignificant effect on insurance companies performance. The possible reason for the result as observed by the researcher is that amount of premium earning was higher than the loss incurred during their study period, for this reason underwriting risk could not have significant effect on profit.

In the contrary, the study finding implies that an increase in underwriting risk, certainly lead to a decrease in performance of Ethiopian insurance companies. It explains that while the claims incurred is higher than the premiums received, the insurer could not raise sufficient revenues from premiums to cover claims or sum insured. Due to this fact, the insurance companies lose their earnings from premiums' revenues causing their profit to decline.

Higher underwriting risk increases loss ratio and associating adverse effect on insurance companies' performance. The possible reasons for the result are misestimating of the appropriate premium price and insufficient diversification of insurance policies to the insured. The underestimation of premium price would exacerbates the loss due to inefficiency of the premium earned would fail to cover the probable claims of the insured. Whereas overrating of the premium would discourage the insured to get the insurance coverage, they so need and only attempt to get insurance cover that is mandatory by the law and regulation. In such a case, the insurance companies would become less competitive as they have less number of insured as well as smaller set of insurance policy portfolio that ultimately reduce their profitability.

Inadequate calculation of risk on the premium issued to the insured need to consider critically the risk associated by repetitive catastrophic events, the risk of changes in legislation and the risk of giving discount on the premium. The models used for the quantification of indemnification required is the most important parameter that affects its height of unreliability. As a result of uncertainty in the model is possible to use wrong statistical inference that approximates the course of the claims. In this way, the expected value of the claim would be wrongly identified.

The finding is consistent with the interview results and the interviewees explained that underwriting is fundamental objective to have stable performance for insurance business. In addition, key informants point out the major causes of underwriting risk are lack of adequate pre risk evaluation and selection, difficulty of standard criteria for risk evaluation, claims handling practice are not up to desirable practice level and most branch managers are concerned by the number of premium they sell rather than optimizing the level of premium through diversification of the policy that approximates the level of probable loss.

Table 4.11 Comparison of test result with expectation

Independent Variables	Expected Relationships with ROA	Actual result	Statistical Significance test	Hypothesis Status
Credit risk	-	-	Significant at 1%	Failed to Reject
Liquidity risk	-	-	Significant at 1%	Failed to Reject
Solvency risk	-	-	Significant at 5%	Failed to Reject
Underwriting risk	-	-	Significant at 1%	Failed to Reject
Technical provisions risk	-	-	Significant at 1%	Failed to Reject
Reinsurance risk	-	+	Insignificant	Reject

Source: Compiled by the researcher

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

The preceding chapter presented the results and discussion, while this chapter deals with summary, conclusion and recommendations based on the findings of the study. Accordingly this, chapter is organized into three subsections.

5.1 Summary of findings

The research general objective was to examine the effect of financial risk on the performance of insurance companies in Ethiopia. The study used sixteen (16) years period of time from 2000-2015 data from eight (8) selected insurance companies in Ethiopia. It carried out by constructing a balanced panel regression model using OLS and as per the Hausman test, fixed effect model was adopted for secondary data obtained from audited annual report. The supporting primary data which was obtained through unstructured in-depth interview of eight sampled finance and risk department managers of Ethiopian insurance companies and two senior officers of insurance supervision department from National Bank of Ethiopia (NBE).

The overall result obtained from the regression model indicates that financial risk has an effect on performance of insurance companies in Ethiopia. The dependent variable used to measure insurance performance was return on asset and independent variables these are credit risk, liquidity risk, reinsurance risk, solvency risk, technical provisions risk and underwriting risk in order to attain the objective of the study.

From the regression result, credit risk, liquidity risk, solvency risk, technical provisions risk and underwriting risk had negative and significant effect on Ethiopian insurers' performance whereas, reinsurance risk had positive and insignificant effect on Ethiopian insurance companies' performance.

5.2 Conclusions

The study specifically examines the effect of financial risk on performance of Ethiopia insurance companies based on the following conclusions.

- The result indicates negative and significant association between credit risk and Ethiopian insurance companies' performance which implies the increase in credit risk inevitably lead to a decline in the performance of the insurance companies due to the likely hood of debtors failing to honor their obligation to the insurance company.
- Liquidity risk has also negative and significant association with Performance of Ethiopian insurance companies. This implies that an increase in liquidity, definitely lead to a decrease in performance of Ethiopian insurance companies. It refers that holding of excess cash and failed to invest on the available investment lead to the consequence of losing an opportunity of making additional revenue.
- Reinsurance risk has positive and insignificant effect on Ethiopian insurance companies' performance. This implies that an increase in reinsurance risk, certainly not lead to a decrease in performance of Ethiopian insurance companies. Even though, reinsurers buffer insurance companies against huge losses, most of the significant claims have been covered by Ethiopian insurance companies. The infant stage of industry sector in the economy made the effect of reinsurance risk on performance of Ethiopian insurance companies is unlikely.
- Solvency risk has shown significant and negative relationship with performance of Ethiopian insurance companies. This implies that an increase in solvency risk, certainly lead to a decrease in performance of insurance companies. It means that higher debt to asset ratio leads to a need of external funding and therefore performance of Ethiopian insurance companies could be affected adversely.

- Technical provisions risk has negative and significant influence on Ethiopian insurance companies' performance. This implies that an increase in technical provision risk, certainly lead to a decrease in performance of Ethiopian insurance companies. This entails that companies holding insufficient provision for outstanding claim would have a negative impact on Ethiopian insurance companies' performance because understatement of outstanding claim could be a reason for insurers being unable to discharge their entire obligation to the insured.
- Underwriting risk has negative and significant relationship with Ethiopian insurance companies' performance. This implies that an increase in underwriting risk, certainly lead to a decrease in performance of Ethiopian insurance companies. This entails that while the costs and claims would be higher than the premiums received, the insurer could not raise sufficient revenues from premiums to cover claims or sum insured.

In general, credit risk, liquidity risk, solvency risk, underwriting risk and technical provisions risk show negative and significant association with performance of Ethiopian insurance companies, where as reinsurance risk has insignificant effect on performance.

5.3 Recommendation

The findings of the study showed that credit risk, liquidity risk, solvency risk, technical provisions risk and underwriting risk are the significant drivers of financial risk which has a negative effect on Ethiopian insurance companies' performance where as reinsurance risk is insignificant financial risk determinant during the study period. Hence, focusing and taking the necessary action on these variables could reduce the probability financial risk effect on Ethiopian insurance companies' performance. Based on the findings which are obtained from regression and interview analysis, the researcher has drawn the following recommendations.

- The analysis indicated that credit risk had negative and significant effect on Ethiopian insurance companies' performance. Thus, Ethiopian insurance companies should manage their receivable amount properly through providing payment arrangement for their debtors which is suitable to pay their debt. By categorizing each debtor's outstanding receivable balance with their period, Ethiopian insurance companies can offer different mode of repayment for debtors to pay their obligation. For instance, for long period of outstanding receivable balance, insisting the debtors to pay their total debt in installment on certain period of time, it could be quarterly, semiannually or annually. In addition, Ethiopian insurance companies should select reinsurer companies listing in best grading level internationally based on their performance. Finally, the researcher recommends also the National Bank regulation to continue as it is restriction of policy issuance on credit which is not applicable to federal or regional government organs. By doing so, Ethiopian insurance companies can reduce the effect of credit risk for their performance.
- The finding explained that liquidity risk had negative and significant effect on Ethiopian insurance companies' performance. Hence, Ethiopian insurance companies should consider investing their idle of cash on various sectors by diversifying their investment portfolio according to NBE insurance companies' investment regulation (SIB/25/2004). Thus, Ethiopian insurance companies should employ this directive properly through develop and implement suitable investment portfolio management which can improve their return.

- The result disclosed that solvency risk had negative and significant effect on the performance of Ethiopian insurance companies. Therefore, Ethiopian insurance companies should strive to attract more customers and boost their income through provision of enhanced estimation technique on insurance policy premium price to maximize their net premium earning and net asset. Since the country is growing and transforming into the age of industry with the existing paid up capital, it will be likely for insurance companies to face solvency risk. Hence, the researcher recommends to increase their paid up capital for those insurance companies who don't full fill NBE (SIB/34/2013) minimum paid up capital requirement by selling additional stock for the existing as well as new shareholders. Therefore, Ethiopian insurance companies should take these suggestions to maximize their return and asset through becoming solvent for their liability.
- The analysis demonstrates that technical provisions risk had negative and significant effect on Ethiopian insurance companies' performance. Consequently, Ethiopian insurance companies should hold sufficient provision for outstanding claims by doing prerequisite adequate assessment on their liabilities and also referring their past experience to develop a comprehensive procedure to effectively monitor and control their outstanding claims. Thus, Ethiopian insurance companies should take in to account these points to reduce the effect of technical provisions risk for their performance.
- The study revealed that underwriting risk had negative and significant effect on Ethiopian insurance companies' performance. For this reason, Ethiopian insurance companies should consider to minimize their costs and claims through proper estimation pricing and valuation technique taking in to account risk of specific sector and catastrophic event. In line with this, they have to provide sufficient premium price for insurance policies which takes high insurance coverage. Furthermore, Ethiopian insurance companies should offer adequate diversification of insurance policy portfolio to have better premium earning that can compensate other loss when it's occurred. Hence, Ethiopian insurance companies should give due attention on these areas to reduce the effect of underwriting risk for their performance.

- Reinsurance risk had insignificant effect on Ethiopian insurance companies. Accordingly, the researcher recommends Ethiopian insurance companies to keep up their attempt to cover most of their claim by themselves. As the cost of reinsurance is mostly very expensive as it is paid in hard currency as well as it has less involvement of reinsurers to indemnify the insured at this time. However, they should make preparation as they engage to including high risk portfolio of clients, because Ethiopian economy is growing and the countries policy is emphasizing on industrialization which made it likely that gradually the emergence of several huge industries in the country is the probability, so when this industries demand insurance coverage they should get it without jeopardizing the going concern of the insurance companies. The researcher also recommends to strength the capacity of the newly emerged Ethiopian reinsurance company in order to simplify treaty negotiations, settlement of claims and payment of ceded premiums in domestic currency within the shortest possible time. Due to this fact, Ethiopian insurance companies should prepare to handle such extraordinary losses.

Therefore, Ethiopian insurance companies should effectively consider the above recommendation in order to minimize financial risk and enhance their performance.

5.4 Direction for Future Research

This study only considered the effect of financial risk on performance of insurance companies in Ethiopian. However, it is recommended for future researchers to further assess other factors of financial risk that can affect firms' performance by incorporating additional insurance specific and macro-economic factors.

Hence, the aspects raised above need further study and the following areas are also recommended for further research.

- The Pricing practice of the premiums by the insurance companies.
- The opportunity cost of not investing excess liquidity by the insurance companies.

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APPENDICES

Appendix 1:-Descriptive Analysis

	<i>ROA</i>	<i>CR</i>	<i>LR</i>	<i>RIR</i>	<i>SR</i>	<i>TPR</i>	<i>UR</i>
<i>Mean</i>	0.082242	0.697342	1.207251	0.134608	0.611250	0.760534	0.659624
<i>Median</i>	0.077322	0.652045	1.145129	0.120000	0.606500	0.544391	0.647929
<i>Maximum</i>	0.393986	1.865895	2.604086	0.620000	0.874590	4.039901	1.287724
<i>Minimum</i>	-0.047559	0.059445	0.390906	0.030000	0.335000	0.100211	0.203299
<i>Std. Dev.</i>	0.054465	0.364566	0.442743	0.071803	0.092652	0.707319	0.159078
<i>Skewness</i>	1.195574	0.678329	1.369160	3.342530	-0.233570	2.711541	0.440093
<i>Kurtosis</i>	10.29403	3.484495	5.357942	20.34634	4.165662	10.56976	3.978881
<i>Jarque-Bera</i>	314.2428	11.06803	69.64420	1843.123	8.410597	462.4590	9.242314
<i>Probability</i>	0.000000	0.003950	0.000000	0.000000	0.014916	0.000000	0.009841
<i>Sum</i>	10.52694	89.25981	154.5281	17.22980	78.24003	97.34836	84.43182
<i>Sum Sq. Dev.</i>	0.376731	16.87936	24.89475	0.654778	1.090214	63.53808	3.213836
<i>Observations</i>	128	128	128	128	128	128	128

Appendix 2:-Hausman Test

Correlated Random Effects - Hausman Test

Equation: HANSUMTEST

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	13.697428	6	0.0332

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LR	-0.045522	-0.043687	0.000014	0.6189
RIR	0.014335	0.054858	0.000713	0.1291
SR	-0.110822	-0.043598	0.001783	0.1114
TPR	-0.020377	-0.012152	0.000015	0.0318
UR	-0.130024	-0.130070	0.000128	0.9968
CR	-0.061551	-0.035841	0.000097	0.0091

Cross-section random effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 01/13/17 Time: 15:42

Sample: 2000 2015

Periods included: 16

Cross-sections included: 8

Total panel (balanced) observations: 128

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.347195	0.053824	6.450519	0.0000
LR	-0.045522	0.012251	-3.715721	0.0003
RIR	0.014335	0.062786	0.228320	0.8198
SR	-0.110822	0.075800	-1.462032	0.1465
TPR	-0.020377	0.006893	-2.956250	0.0038
UR	-0.130024	0.029677	-4.381377	0.0000
CR	-0.061551	0.015647	-3.933649	0.0001

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.403569	Mean dependent var	0.082242
Adjusted R-squared	0.335555	S.D. dependent var	0.054465
S.E. of regression	0.044396	Akaike info criterion	-3.288420
Sum squared resid	0.224694	Schwarz criterion	-2.976479
Log likelihood	224.4589	Hannan-Quinn criter.	-3.161677
F-statistic	5.933621	Durbin-Watson stat	1.527435
Prob(F-statistic)	0.000000		

Appendix 3:-Test of Heteroskedasticity

Heteroskedasticity Test: White

F-statistic	1.309162	Prob. F(9,117)	0.2395
Obs*R-squared	11.61938	Prob. Chi-Square(9)	0.2356
Scaled explained SS	9.107850	Prob. Chi-Square(9)	0.4274

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 01/13/17 Time: 15:43

Sample: 2 128

Included observations: 127

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000228	0.000768	-0.296352	0.7675
CR^2	0.000313	0.000264	1.185368	0.2383
LR^2	0.000130	0.000126	1.030416	0.3049
RIR^2	0.003966	0.003656	1.084852	0.2802
SR^2	0.001536	0.001772	0.866723	0.3879
TPR^2	8.08E-05	5.70E-05	1.417985	0.1589
UR^2	0.000170	0.000708	0.240444	0.8104
ROA(-1)^2	0.016736	0.009652	1.733872	0.0856
D60^2	-0.001782	0.001648	-1.081272	0.2818
D64^2	-0.000789	0.001604	-0.491719	0.6238

R-squared	0.091491	Mean dependent var	0.001166
Adjusted R-squared	0.021606	S.D. dependent var	0.001591
S.E. of regression	0.001574	Akaike info criterion	-9.995365
Sum squared resid	0.000290	Schwarz criterion	-9.771413
Log likelihood	644.7057	Hannan-Quinn criter.	-9.904376
F-statistic	1.309162	Durbin-Watson stat	1.703362
Prob(F-statistic)	0.239462		

Appendix 4: - Test of autocorrelation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.353084	Prob. F(2,115)	0.2625
Obs*R-squared	2.919842	Prob. Chi-Square(2)	0.2323

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 01/13/17 Time: 15:43

Sample: 2 128

Included observations: 127

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.021940	0.039154	0.560348	0.5763
CR	-0.001874	0.010227	-0.183245	0.8549
LR	-0.001598	0.009461	-0.168937	0.8661
RIR	-0.007630	0.046121	-0.165433	0.8689
SR	-0.001202	0.051709	-0.023246	0.9815
TPR	-0.002370	0.004842	-0.489395	0.6255
UR	-0.010232	0.024203	-0.422771	0.6733
ROA(-1)	-0.100145	0.092911	-1.077859	0.2834
D60	0.002102	0.036874	0.056993	0.9546
D64	-0.008349	0.037630	-0.221869	0.8248
RESID(-1)	0.165307	0.134032	1.233340	0.2200
RESID(-2)	0.133817	0.101654	1.316399	0.1907

R-squared	0.022991	Mean dependent var	-7.64E-17
Adjusted R-squared	-0.070462	S.D. dependent var	0.034282
S.E. of regression	0.035469	Akaike info criterion	-3.750609
Sum squared resid	0.144674	Schwarz criterion	-3.481867
Log likelihood	250.1637	Hannan-Quinn criter.	-3.641423
F-statistic	0.246015	Durbin-Watson stat	1.987520
Prob(F-statistic)	0.993343		

Appendix 5:- Model Specification test

Ramsey RESET Test

Equation: RAMSEYTEST

Specification: ROA C CR LR RIR SR TPR UR

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.724747	120	0.4700
F-statistic	0.525259	(1, 120)	0.4700
Likelihood ratio	0.559054	1	0.4546

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.001098	1	0.001098
Restricted SSR	0.251837	121	0.002081
Unrestricted SSR	0.250739	120	0.002089
Unrestricted SSR	0.250739	120	0.002089

LR test summary:

	Value	df
Restricted LogL	217.1602	121
Unrestricted LogL	217.4397	120

Unrestricted Test Equation:

Dependent Variable: ROA

Method: Least Squares

Date: 01/13/17 Time: 15:47

Sample: 1 128

Included observations: 128

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.196294	0.117120	1.676002	0.0963
CR	-0.024552	0.019982	-1.228755	0.2216
LR	-0.030099	0.022275	-1.351260	0.1792
RIR	0.039105	0.062415	0.626535	0.5322
SR	-0.033927	0.066174	-0.512692	0.6091
TPR	-0.008926	0.007391	-1.207759	0.2295
UR	-0.085021	0.068278	-1.245210	0.2155
FITTED^2	2.293547	3.164616	0.724747	0.4700

R-squared	0.334434	Mean dependent var	0.082242
Adjusted R-squared	0.295609	S.D. dependent var	0.054465
S.E. of regression	0.045711	Akaike info criterion	-3.272495
Sum squared resid	0.250739	Schwarz criterion	-3.094243
Log likelihood	217.4397	Hannan-Quinn criter.	-3.200071
F-statistic	8.613948	Durbin-Watson stat	1.490357
Prob(F-statistic)	0.000000		

Appendix 6:- Insurance Companies in Ethiopia

<i>S/N</i>	<i>Name</i>	<i>Established Date</i>	<i>Type(life & non-life insurance)</i>	<i>Ownership</i>	<i>Sample</i>
<i>1</i>	<i>Ethiopian Insurance Corporation</i>	<i>1975</i>	<i>Both</i>	<i>Governmental</i>	<i>Include</i>
<i>2</i>	<i>Africa Insurance company S.C</i>	<i>01/12/1994</i>	<i>Both</i>	<i>Private</i>	<i>>></i>
<i>3</i>	<i>Awash insurance company S.C</i>	<i>01/10/1994</i>	<i>Both</i>	<i>>></i>	<i>>></i>
<i>4</i>	<i>National Insurance company of Ethiopia S.C</i>	<i>23/09/1994</i>	<i>non-life insurance</i>	<i>>></i>	<i>>></i>
<i>5</i>	<i>Nyala Insurance company S.C</i>	<i>06/01/1995</i>	<i>Both</i>	<i>>></i>	<i>>></i>
<i>6</i>	<i>Nile Insurance company S.C</i>	<i>11/04/1995</i>	<i>Both</i>	<i>>></i>	<i>>></i>
<i>7</i>	<i>The United Insurance S.C</i>	<i>01/04/1997</i>	<i>Both</i>	<i>>></i>	<i>>></i>
<i>8</i>	<i>Global Insurance Company S.C</i>	<i>11/01/1997</i>	<i>non-life insurance</i>	<i>>></i>	<i>>></i>
<i>9</i>	<i>Nib Insurance Company S.C</i>	<i>01/05/2002</i>	<i>Both</i>	<i>>></i>	<i>Exclude</i>
<i>10</i>	<i>Lion Insurance Company S.C</i>	<i>01/07/2007</i>	<i>non-life insurance</i>	<i>>></i>	<i>>></i>
<i>11</i>	<i>Oromia Insurance Company S.C</i>	<i>26/01/2009</i>	<i>Both</i>	<i>>></i>	<i>>></i>
<i>12</i>	<i>Abay Insurance Company S.C</i>	<i>06/07/2010</i>	<i>non-life insurance</i>	<i>>></i>	<i>>></i>
<i>13</i>	<i>Berhan Insurance Company S.C</i>	<i>24/05/2011</i>	<i>non-life insurance</i>	<i>>></i>	<i>>></i>
<i>14</i>	<i>Tsehay Insurance Company S.C</i>	<i>08/03/2012</i>	<i>non-life insurance</i>	<i>>></i>	<i>>></i>
<i>15</i>	<i>Ethio life & General Insurance Company S.C</i>	<i>23/10/2008</i>	<i>Both</i>	<i>>></i>	<i>>></i>
<i>16</i>	<i>Lucy Insurance Company S.C</i>	<i>2011</i>	<i>non-life insurance</i>	<i>>></i>	<i>>></i>
<i>17</i>	<i>Bunna Insurance Company S.C</i>	<i>2012</i>	<i>non-life insurance</i>	<i>>></i>	<i>>></i>

Source: <http://www.nbe.gov.et/financial/insurer>

Appendix 7:- Interview Instrument

Addis Ababa University

College of Business and Economics

Department of Accounting and Finance

MSC in Accounting and Finance

Instrument for unstructured face to face interview on the effect of financial risk on performance of insurance companies in Ethiopia

1. In what condition that credit risk, liquidity risk, solvency risk, underwriting risk, technical provisions risk and reinsurance risk affected performance of your company?
2. From the above identified risks which of them are more affects your insurance company's performance?
3. What types of measures are taken by your company in order to reduce the risks that decline performance?
4. Any idea or comment?

Appendix: - 8 Raw data used for analysis

<i>YEAR</i>	<i>INSURANCE CO.</i>	<i>ROA</i>	<i>CR</i>	<i>LR</i>	<i>RIR</i>	<i>SR</i>	<i>TPR</i>	<i>UR</i>
2000	1(Ethiopian Insurance Co.)	0.09891	0.733	1.05926	0.08	0.707	0.67311	0.55286
2001	1	0.08446	0.82939	1.1083	0.1	0.715	0.81091	0.64583
2002	1	0.07002	1.13114	1.16128	0.19	0.736	0.59034	0.2033
2003	1	0.06108	0.94345	1.1705	0.14	0.737	0.69379	0.65003
2004	1	0.07538	0.87942	1.21344	0.15	0.723	0.98799	0.50785
2005	1	0.07848	0.65833	1.35845	0.15	0.72	0.87914	0.55994
2006	1	0.05733	0.73522	1.41298	0.15	0.59	0.8168	0.67932
2007	1	0.06878	0.43532	1.42816	0.17	0.593	0.91906	0.70542
2008	1	0.0701	0.34761	1.22631	0.19	0.626	0.98193	0.90182
2009	1	0.06617	0.38611	1.3485	0.2	0.636	0.94374	0.84046
2010	1	0.10208	0.39678	1.30949	0.27	0.641	0.87156	0.62596
2011	1	0.08781	0.48509	1.26372	0.27	0.638	0.71772	0.74458
2012	1	0.10857	1.12052	0.93472	0.24	0.856	0.34971	0.71129
2013	1	0.13061	0.60948	1.22222	0.37	0.669	0.354	0.60374
2014	1	0.15113	0.2819	1.25967	0.43	0.656	0.46223	0.59844
2015	1	0.14809	0.47665	1.23712	0.18	0.657	0.47705	0.73919
2000	2(Africa Insurance S.C.)	0.12406	1.01241	1.53579	0.11	0.541	0.47427	0.46699
2001	2	0.13377	1.26301	1.42328	0.09	0.589	0.43859	0.51353
2002	2	0.14365	1.18758	1.56859	0.08	0.531	0.37228	0.39801
2003	2	0.07974	1.17565	1.41503	0.26	0.581	0.50937	0.58559
2004	2	0.01068	1.14589	1.28292	0.11	0.616	1.01326	0.67113
2005	2	-	0.00341	1.1393	1.14096	0.12	0.676	0.74968
2006	2	0.06962	1.43035	1.22663	0.13	0.672	0.67986	0.60159
2007	2	0.01908	1.6464	1.14429	0.15	0.702	0.71866	0.80724
2008	2	0.03465	1.8659	1.06258	0.12	0.75	1.00795	0.91149
2009	2	0.04335	1.48869	1.03637	0.12	0.72	1.06606	0.99368
2010	2	0.05264	1.72829	0.99169	0.13	0.738	2.98536	0.88052
2011	2	0.04799	1.23302	0.93103	0.13	0.752	2.6261	0.91471
2012	2	0.04803	1.18757	0.78742	0.16	0.737	2.89538	0.85395
2013	2	0.00971	0.60874	0.54818	0.12	0.69	4.0399	0.85346
2014	2	0.06832	0.36131	0.84013	0.13	0.659	3.9456	0.89516

2015	2	0.06001	0.16709	0.39668	0.12	0.599	2.3615	0.80978
2000	3 (Awash Insurance S.C)	0.12835	0.58089	1.40679	0.07	0.554	2.70021	0.51689
2001	3	0.13454	0.69885	0.5579	0.09	0.545	2.0982	0.53411
2002	3	0.07713	0.86517	1.32014	0.09	0.566	0.33156	0.62303
2003	3	0.07751	0.95592	1.31903	0.09	0.565	0.41933	0.59619
2004	3	- 0.03254	0.85298	1.78469	0.03	0.574	2.78456	0.53062
2005	3	0.07479	0.71869	1.25785	0.08	0.573	0.45117	0.59168
2006	3	0.05601	0.6513	1.20923	0.14	0.613	0.40882	0.66016
2007	3	0.06026	0.59089	1.0876	0.1	0.642	0.44115	0.94728
2008	3	0.0629	0.61727	0.9307	0.11	0.649	0.57974	0.8205
2009	3	0.04705	0.57522	0.9121	0.12	0.668	0.54093	0.81524
2010	3	0.09978	0.55806	0.97899	0.11	0.627	1.0015	0.62492
2011	3	0.07264	0.67884	0.9156	0.11	0.683	0.58421	0.77003
2012	3	0.07228	0.56299	0.96006	0.17	0.707	0.59941	0.66121
2013	3	0.12505	0.21983	1.09989	0.07	0.628	0.42081	0.54786
2014	3	0.09229	0.16894	1.10697	0.08	0.581	0.31025	0.57902
2015	3	0.09547	0.17457	1.08416	0.09	0.583	0.53088	0.56821
2000	4(Nice Insurance S.C)	0.19686	0.94468	0.59274	0.11	0.586	0.50597	0.7313
2001	4	- 0.03462	1.15056	2.20457	0.08	0.626	0.69576	0.82944
2002	4	0.03571	1.13628	0.72671	0.16	0.636	0.46079	1.28772
2003	4	0.04701	1.16078	0.73783	0.14	0.62	0.50797	0.67427
2004	4	0.02443	1.23418	0.76661	0.12	0.649	0.49842	0.65579
2005	4	- 0.04714	1.46732	1.986	0.12	0.71	0.51428	0.72301
2006	4	0.062	1.00073	0.73212	0.14	0.683	0.54898	0.66033
2007	4	0.08491	1.10168	0.94899	0.12	0.682	0.59695	0.84654
2008	4	0.05718	1.16195	0.93149	0.17	0.666	0.84983	0.7669
2009	4	0.04625	0.87085	0.81124	0.19	0.68	1.11653	0.80208
2010	4	0.05883	1.06787	0.99205	0.23	0.703	1.00178	0.67727
2011	4	0.159	1.52339	0.54699	0.16	0.79986	0.36457	0.72756
2012	4	0.17428	0.92753	0.5466	0.17	0.751	0.49273	0.54051
2013	4	0.0588	0.15467	0.85	0.15	0.79855	2.42063	0.59027
2014	4	0.06947	0.63075	2.52319	0.11	0.6036	0.41646	0.70024
2015	4	0.39399	0.2781	0.859	0.08	0.678	0.61521	0.56199
2000	5 (Nyala Insurance S.C)	0.12005	0.69646	1.02049	0.18	0.609	0.55932	0.49333
2001	5	0.13196	0.70032	1.08895	0.16	0.642	0.50544	0.40494

2002	5	0.13019	0.92309	1.10693	0.13	0.643	0.53596	0.49434
2003	5	0.09471	0.79849	1.04492	0.08	0.615	0.37334	0.47018
2004	5	0.05802	0.58678	1.07568	0.1	0.559	0.50969	0.58996
2005	5	0.07197	0.52591	1.08374	0.11	0.524	0.58456	0.49026
2006	5	0.09117	0.38375	1.24802	0.11	0.56	0.1268	0.59318
2007	5	0.0926	0.46266	1.14856	0.15	0.554	0.69921	0.52396
2008	5	0.05283	0.69701	1.02013	0.14	0.617	0.47789	0.77856
2009	5	0.12147	0.50096	1.011	0.15	0.549	0.51277	0.67817
2010	5	0.1218	0.78636	1.00933	0.22	0.625	1.03476	0.70881
2011	5	0.138	0.37657	1.21042	0.19	0.527	0.69742	0.54837
2012	5	0.15844	0.38172	1.32928	0.15	0.524	0.52579	0.40937
2013	5	0.14751	0.21373	1.23686	0.18	0.594	0.56911	0.46081
2014	5	0.12589	0.21992	1.31701	0.14	0.581	0.51044	0.41972
2015	5	0.10998	0.09771	1.25451	0.13	0.636	0.49788	0.57223
2000	6 (Niel Insurance S.C)	0.11672	0.62596	1.03278	0.05	0.544	0.43038	0.48541
2001	6	0.11017	0.67102	1.09723	0.05	0.557	0.43655	0.56012
2002	6	0.11224	0.6221	1.13956	0.05	0.556	0.19239	0.56572
2003	6	0.09527	0.53363	1.12133	0.07	0.54	0.25778	0.54573
2004	6	0.01477	0.51983	2.5999	0.05	0.583	0.20052	0.75308
2005	6	0.03889	0.54325	0.92206	0.09	0.625	0.2277	0.81477
2006	6	0.0339	0.59604	1.08686	0.11	0.696	0.17764	0.79862
2007	6	0.09876	0.80393	0.59457	0.1	0.67986	0.10522	0.97178
2008	6	- 0.02456	0.98564	0.39091	0.1398	0.87459	0.10021	0.83037
2009	6	0.01969	0.68059	0.8374	0.17	0.701	0.1292	0.80926
2010	6	0.12558	0.47713	1.4018	0.11	0.59	1.0125	0.71474
2011	6	0.08805	0.65279	1.04518	0.11	0.617	0.21754	0.84954
2012	6	0.09337	0.61119	1.1679	0.12	0.608	0.1829	0.79624
2013	6	0.09942	0.19492	1.21892	0.11	0.605	0.25696	0.73032
2014	6	0.10526	0.10077	1.24937	0.09	0.597	0.59115	0.70059
2015	6	0.07558	0.0791	1.30766	0.08	0.573	1.52	0.68563
2000	7 (United Insurance S.C)	0.08071	0.71087	1.30959	0.07	0.576	0.30928	0.59689
2001	7	0.07247	0.62633	1.41802	0.08	0.517	0.23755	0.68401
2002	7	0.06483	0.74771	1.24201	0.05	0.55	0.64634	0.61364
2003	7	0.06592	0.73179	1.30413	0.09	0.544	0.65679	0.77476
2004	7	- 0.04756	0.71008	1.8469	0.08	0.549	2.34569	0.84823
2005	7	- 0.01316	0.68179	1.14597	0.11	0.529	0.73823	0.81591

2006	7	0.0811	0.50014	1.31632	0.09	0.496	0.6645	0.50762
2007	7	0.0896	0.50504	1.19974	0.17	0.542	0.54785	0.96609
2008	7	0.14772	0.54927	1.19989	0.22	0.558	0.50373	0.79849
2009	7	0.04122	0.72708	0.879	0.2	0.76458	0.6789	0.77506
2010	7	0.126	0.35797	1.27682	0.15	0.57	1.01201	0.58365
2011	7	0.07671	0.44978	1.33292	0.18	0.574	0.48953	0.71889
2012	7	0.10747	0.46978	1.35711	0.17	0.586	0.41185	0.64298
2013	7	0.15233	0.09907	1.40005	0.16	0.56	0.42853	0.54383
2014	7	0.12317	0.05945	1.01277	0.12	0.548	1.09292	0.53803
2015	7	0.11205	0.13201	0.88076	0.12	0.487	0.44851	0.60458
2000	8 (Global Insurance S.C)	0.12414	0.83936	2.32488	0.15	0.372	0.37911	0.49613
2001	8	0.11798	0.82513	2.08043	0.11	0.418	0.34785	0.4202
2002	8	0.11427	0.67997	2.51365	0.11	0.345	0.4509	0.34968
2003	8	0.03096	0.5176	2.57158	0.11	0.337	0.52612	0.67149
2004	8	0.03333	0.466	2.60409	0.13	0.335	0.49093	0.49874
2005	8	0.04045	0.51476	2.24557	0.62	0.476	0.58642	0.42781
2006	8	0.04319	0.57276	2.30616	0.09	0.453	0.73627	0.5568
2007	8	0.05457	0.58933	1.54321	0.1	0.479	0.63766	0.50294
2008	8	0.04519	0.64744	0.84569	0.09	0.554	0.58358	0.5119
2009	8	0.05411	0.82031	0.96188	0.09	0.577	0.63977	0.53111
2010	8	0.08049	0.7046	0.8395	0.08	0.595	0.74146	0.44558
2011	8	0.03642	0.72388	0.91947	0.12	0.574	0.50235	0.78775
2012	8	0.0203	0.86013	0.91597	0.12	0.681	0.16822	0.87616
2013	8	0.15318	0.48734	0.59746	0.1	0.647	0.35683	0.56819
2014	8	0.16034	0.3308	1.35191	0.09	0.57	0.12	0.57349
2015	8	0.13642	0.20063	1.63196	0.08	0.488	0.88724	0.62958