



# **The effects of risk management on financial performance of Ethiopian insurance companies**

**By: Zinaye W/Michael**

**Addis Ababa, Ethiopia  
January, 2017**



# **The effects of risk management on financial performance of Ethiopian insurance companies**

**By: Zinaye W/Michael**

**A thesis submitted to the Department of Accounting and Finance in partial fulfillment for the requirement of the Degree of Master of Science in Accounting & Finance**

**Addis Ababa University  
Faculty of Business and Economics  
Department of Accounting and Finance**

**Addis Ababa, Ethiopia  
February, 2017**

## **Declaration**

I, undersigned declare that this thesis is my original work. Furthermore, all sources of materials used for the thesis had been duly acknowledged.

Name: Zinaye W/Michael

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Place: Addis Ababa University

**Addis Ababa University**  
**Faculty of Business and Economics**  
**Department of Accounting and Finance**

This is to certify that the thesis prepared by Zinaye W/Michael, entitled: Effects of Risk Management on the Financial Performances of Ethiopian Insurance Companies: submitted in partial fulfillment of the requirements for the Degree of Master of Science in Accounting and Finance complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

Signed by the examining committee:

Advisor: Dr. Sewale Abate                      Signature \_\_\_\_\_                      Date \_\_\_\_\_

Examiner: Dr. P. Laxmikantham                      Signature \_\_\_\_\_                      Date \_\_\_\_\_

Examiner: Dr. Mehari Mekonnen                      Signature \_\_\_\_\_                      Date \_\_\_\_\_

# Table of Contents

List of Tables.....	v
List of Figures.....	vi
Acknowledgement.....	vii
Acronyms and Abbreviations.....	viii
Abstract.....	ix

## CHAPTER ONE: BACKGROUND OF THE STUDY .....1

1.1. The Insurance Industry in Ethiopia .....	2
1.2. Statement of the Problem.....	3
1.3. Objective of the Study.....	4
1.4. Hypothesis of the Study.....	5
1.5. Scope of the Study.....	6
1.6. Significance of the Study.....	6
1.7. Organization of the Paper.....	6

## CHAPTER TWO: REVIEW OF LITERATURE .....7

2.1. Theories of Risk Management and Financial performance.....	7
2.1.1. Contingency Planning Theory.....	8
2.1.2. Enterprise Risk Management Theory.....	9
2.1.3. Managerial Self-interest Theory.....	9
2.1.4. DuPont Theory .....	10
2.2. Insurance and Risk Management .....	11
2.3. Financial Performance Measurements.....	15
2.4. Risk Management & Financial Performance: An Empirical Review.....	17
2.5. Risk Selection and Research Hypothesis.....	20
2.6. Related Empirical Studies in Ethiopia.....	22
2.7. Summary and Knowledge Gap .....	30
2.8. Conceptual Framework.....	31

## CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY.....33

3.1. Research Design.....	33
3.2. Research Approaches.....	33
3.3. Population and Sampling Techniques.....	34
3.4. Source of Data and Data Collection Instruments.....	36
3.5. Variable Measurement.....	37
3.6. Model Specification.....	39
3.7. Data Presentation and Analysis Techniques.....	41

<b>CHAPTER FOUR: RESULT AND DISCUSSION .....</b>	<b>42</b>
4.1. Descriptive Statistics.....	42
4.2. Correlation Analysis.....	45
4.3. Model Specification Test .....	46
4.4. Model Diagnosis.....	48
4.5. Regression Results and Analysis.....	52
4.5.1. Technical Reserve Risk and Return on Asset.....	55
4.5.2. Company Size and Return on Asset.....	56
4.5.3. Reinsurance Risk and Return on Asset.....	57
4.5.4. Liquidity Risk and Return on Asset .....	58
4.5.5. Claim Settlement Risk and Return on Asset.....	60
4.5.6. Underwriting Risk and Return on Asset.....	60
 <b>CHAPTER FIVE: SUMMARY CONCLUSION &amp; RECOMMENDATION.....</b>	<b>63</b>
5.1. Summary.....	63
5.2. Conclusion.....	64
5.2. Recommendations.....	65

## **References**

## **Appendixes**

## List of Tables

Table 3.1 Sampled Insurers' Market Share.....	36
Table 3.2: Description of the Variables.....	39
Table 4.1: Descriptive Statistics of the Variables.....	42
Table 4.2: Correlation Matrix.....	45
Table 4.3: Random Effect Test.....	46
Table 4.4: Redundant Fixed Effect Test.....	47
Table 4.5: Heteroskedasticity Test: White.....	49
Table 4.6: Correlation Matrix between Independent Variables.....	51
Table 4.7: Regression Result.....	54

## List of Figures

Figure 2.1: conceptual Framework.....	32
Figure 4.1: Rejection and Non-Rejection Regions for Durbin-Watson Test.....	50
Figure 4.2: Normality Test Result.....	52

## **ACKNOWLEDGEMENT**

First and foremost, I would like to thank and praise the Almighty God for being my strength, His endlessness and all-embracing not only for helping me to finalize this paper, rather for showing me the light and for being there for me in all the difficult and annoying times throughout my life. My dearest mother W/ro. Ayelech Awoke and my beloved father Ato W/Michael Tajebe, who gave me a moral and spiritual support to start this program; you are my counselors and supporters in life, I will always love and thank you. Also my sincere and deepest gratitude goes to Ato Alemu Tereda for his expert guidance, helpful criticism, valuable suggestions and encouragement during the completion of this work. And my special appreciation also goes to Ato Muhidin Shifa and Ato Yinebeb Ephrem, for their comments and suggestions which contributed significantly to my study. I would also like to thank my sincere colleagues and friends for their kind support and encouragement to finalize this study.

## Acronyms and Abbreviations

BLUE	Best Linear Unbiased Estimator
CLRM	Classical Linear Regression Model
CNWP	Change in Net Written Premium
COSO	Committee of Sponsoring Organizations of the Tread way Commission
CP	Contingency Planning
CS	Claim Settlement
DW	Durbin Watson
EIC	Ethiopian Insurance Corporation
EML	Estimated Minimum Loss
ERM	Enterprise Risk Management
FEM	Fixed Effect Model
ISD	Insurance Supervision Directorate
LQ	Liquidity Risk
NBE	National Bank of Ethiopia
OLS	Ordinary List Square
REM	Random Effect Model
ROA	Return on Asset
ROE	Return on Equity
RR	Reinsurance Risk
SIB	Supervision of Insurance Business
SZ	Size
T	Current year
T-1	Previous Year
TA	Total Asset
TR	Technical Reserve Risk
TRM	Traditional Risk Management
UNCTAD	United Nation Conference on Trade and Development
UR	Underwriting Risk

## **Abstract**

*The study focuses on the investigation of the risk management factors that affect the financial performance of the Ethiopian insurance industry. Managing risks is an important factor which insurers must attend to achieve their financial performance. From this perspective, risk management becomes one of the most important practices to be used in insurers in order to get higher returns. Therefore, this study is attempted to ascertain the relationship between risk management and financial performance of insurers in Ethiopia. In order to achieve this objective, the study used explanatory research design, mixed research approach. Panel data covering eleven-years (2005–2015) are analyzed for nine insurers in Ethiopia. Also in-depth interview is conducted with the NBE officers. The results of the fixed effect regression model revealed that technical reserve and liquidity risks have negative & significant impact on ROA (proxy measure for financial performance) of non-life insurers in Ethiopia, whereas company size and reinsurance risk have positive & significant effect on ROA. The study led to the conclusion that technical reserve, size of a company, reinsurance risks and liquidity risk are the pull factors for the financial performance of insurers. On the basis of these findings, the study recommends that there is greater need for Ethiopia insurers to manage the risks particularly technical reserve risk, reinsurance risk and liquidity risk more integrally. The study also recommends Ethiopian insurers to increase their size by enhancing their assets base.*

**Keywords:** risk management, financial performance, insurance companies

# **Chapter One:**

## **Background of the study**

In modern society, financial industry is growing rapidly and gaining importance in the global financial development. According to Mishkin & Eakins (2013), financial markets and institutions not only affect our everyday life but also involve huge flows of funds, which in turn affect business profits, the production of goods and services, and even the economic well-being of countries. The role of financial institutions in the economy of a country in general and insurance companies in particular are facilitate the efficient and effective financial system through saving mobilization, risk transfer and intermediation (Das et al., 2003). Therefore, financial institutions, channel funds and transfers risks from one economic unit to another economic units so as to facilitate trade and resources arrangement. More specifically the insurance sector plays important role in the financial services industry in almost developed and developing countries, contributing to economic growth, efficient resource allocation, reduction of transaction costs, creation of liquidity, facilitation of economics of scale in investment, and spread of financial losses (Haiss & Sumegi, 2008). Research surveyed by Naveed et al. (2011), cited in (Yuvaraj, 2013), shows that the efficiency of financial intermediation and transfer of risk can affect economic growth while at the same time institutional insolvencies can result in systemic crises which have unfavorable consequences for the economy as a whole. Uncertainty and volatility are the main attributes of today's nations' economies. While, insurers represent the major players in these economies, its risk management are crucial issues that need more investigation.

Risk management is an important discipline in business especially the insurance business. Recently, businesses put great emphasis on risk management as this determines their survival and business performance. Geczy et al. (1997) note that companies use financial risk management to reduce cash flow variations which could otherwise prevent companies to invest in different growth prospects. Boyabatli & Toktay (2004) state that increasing shareholder value by enhancing firm value through the management of risk exposures is the main objective of risk management programs. Insurance companies are in the risk business and as such cover various types of risks for individuals, businesses and companies. It is therefore, necessary that insurance companies manage their risk exposure and conduct proper analysis to avoid losses due to the compensation claims made by the insured. A robust risk management framework can help organizations to reduce their exposure to risks, and enhance their financial performance (Iqbal & Mirakhor, 2007). Further, it is argued that the selection of particular risk tools tends to be

associated with the firm's calculative culture the measurable attitudes that senior decision makers display towards the use of risk management models. While some risk functions focus on extensive risk measurement and risk based performance management, others focus instead on qualitative discourse and the mobilization of expert opinions about emerging risk issues (Mikes & Kaplan, 2014). Moreover, Bandara & Weerakoon (2012) asserted that risk management is important in insurance firms as it is the backbone of success

Finally, this study is examined the effects of risk management on insurer's financial performance in Ethiopia. This will not only add to existing literature but also it will serve as identifying the effects of risk management on insurance companies' performance is useful for insurance practitioners, researchers, financial analysts and supervisory authorities.

### **1.1. The Insurance Industry in Ethiopia**

The history of insurance service is as far back as modern form of banking service in Ethiopia which was introduced in 1905 when the bank of Abyssinia began to transact fire and marine insurance as an agent of a foreign insurance company. Subsequently the number of insurance companies increased significantly and reached 33 in 1960. According to Hailu (2007), the first significant event that the Ethiopian insurance market observation was the issuance of proclamation No. 281/1970 and it was issued to provide for the control & regulation of insurance business in Ethiopia. The law required an insurer to be a domestic company whose share capital to be not less than Birr 0.4 million for a general insurance business and Birr 0.6 million in the case of long-term insurance business and Birr 1 million for both insurance business. Non-Ethiopian nationals were not barred from involving in insurance business however domestic company as a share company having its head office in Ethiopia and in the case of a company transacting a general insurance business at least 51% and in the case of a company transacting life insurance business, at least 30% of the paid-up capital must be held by Ethiopian national companies. Four years later the enactment of the proclamation, the military government that came to power in 1974 put an end to all private enterprise. Then all insurance companies operating were nationalized and from January 1, 1975 onwards the government took over the ownership and control of these companies & merged them into a single unit called Ethiopian Insurance Corporation.

The nationalization of private insurance companies, the restrictions imposed on private business ventures, and management of the insurance sector had significant adverse impact on the development and growth of Ethiopian insurance industry (Hailu, 2007). However, following the change in the political environment in 1991, the proclamation for the licensing and supervision of insurance business No. 86/1994 heralded the beginning of a new era. Immediately after the enactment of the proclamation private insurance companies began to flourish. According to the Directive of ISB/34/2014, any insurance company required to be a domestic company whose share capital to be not less than Ethiopian Birr 60 million for a general insurance business and Ethiopian Birr 15 million in the case of long term (life) insurance business and Ethiopian Birr 75 million to do both long-term & general insurance business.

Today the total number of insurance companies, their asset and capital increased significantly. At 2015, there are 17 insurance companies in operation. Ethiopian Insurance Corporation (EIC) is state owned while the rest all are private. The total asset and total capital of the sector reached 8.36 billion and 2.55 billion respectively. In addition the gross premium of sector is 5.56 billion in 2015.

## **1.2. Statement of the Problem**

Insurance companies are in the core business of managing risk. They manage the risks of both their clients and their own risks. This requires an integration of risk management into the companies' systems, processes and culture. Agyei & Yeboah (2011) indicated that, some financial institutions have had difficulties in growth of their profitability and some end up closing their doors; probably inadequate risk management policies and practices are the major causes of failures and poor performance of these firms. Further, Kadi (2003) 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 consistent increase in losses which resulted in hindering of their financial performance (Magezi, 2003). So according to these authors, insurers' financial loss may be happened due to inadequate liquidity management, underpricing (imprudent underwriting practice), management issues and high tolerance to investment risks.

Nonetheless, in the context of Ethiopian insurance industry, the subject has received a limited research attention. In which case, in order to either prove the above premises or reach into some other assertion regarding the relationship between risk management and financial performance of Ethiopian insurance companies, empirical investigation is lacking. As far as the knowledge of the researcher is concerned, there are only two studies regarding risk management and insurance financial performance in Ethiopian insurance industry until this date. In the case of Ethiopian insurance industry as the best knowledge of the researcher there are only two studies regarding risk management and insurance financial performance. Rebuma (2013), and kokebe & Gemechu (2016), both studies focused on risk management techniques (loss prevention & control, loss financing, and risk avoidance) and analyzed by using correlation matrix. According to Brooks (2008), though regression as a tool is more flexible and more powerful than correlation, the two studies' data were analyzed by correlation which simply stated that there is evidence for a linear relationship between the variables, and that movements in the variables are on average related to an extent given by the correlation coefficient. Nevertheless the researcher motivation is kinds of risk management in insurance companies the targeted factors are liquidity, technical reserve, company size, claim settlement, reinsurance and underwriting risk and their effect on financial performance in Ethiopia and data analyzed by multiple linear regressions in addition to correlation.

Therefore, this paper is intended to fill this gap and provide helpful empirical evidence in the study area on the issue of interest.

### **1.3. Objectives of the Study**

The general objective of this study is to empirically test the effects of risk management on the financial performance of non-life insurance companies in Ethiopia. The specific objectives of this study are;

- To examine the effects of liquidity risk on the financial performance of Ethiopian insurers.
- To test the effects of technical reserve risk on the financial performance of Ethiopian insurers.
- To experiment the effects of company size on the financial performance of Ethiopian insurers.

- To investigate the effects of claim settlement risk on the financial performance of Ethiopian insurers.
- To examine the effects of reinsurance risk on the financial performance of Ethiopian insurers.
- To examine the effects of underwriting risk on the financial performance of Ethiopian insurers.
- To rank the impacts of factors according to their degrees of influence on Ethiopian non-life insurers' financial performance.
- To draw conclusions and forward recommendations to insurers and regulator.

#### **1.4. Hypothesis of the Study**

Hypotheses of the study stands on the theories related to insurers' risk management and financial performance that have been developed over the years by insurance industry and researchers' past empirical studies related to insurers' risk management and financial performance. The results from the literature review were used to establish expectations for the relationship of the different variables. Hence, based on the objective, the present study seeks to test the following six hypotheses:

*H1: Liquidity risk has a significant and negative effect on Ethiopian non-life insurers' financial performance;*

*H2: Technical reserve risk has a significant and negative effect on Ethiopian non-life insurers' financial performance;*

*H3: Company size has a significant and positive effect on Ethiopian non-life insurers' financial performance;*

*H4: Claim settlement risk has negative and significant effect on Ethiopian non-life insurers' financial performance;*

*H5: Reinsurance risk has positive and significant effect on Ethiopian non-life insurers' financial performance;*

*H6: Underwriting risk has negative and significant effect on Ethiopian non-life insurers' financial performance;*

## **1.5. Scope of the Study**

The researcher focused on the effects of risk management on the financial performance of insurance industry by taking evidence from insurance companies for the period of eleven years, from 2005 to 2015. The dependent variables are delimited to financial performance level (ROA). The explanatory variables are delimited to liquidity risk, technical reserve risk, company size, claim settlement risk, reinsurance risk and underwriting risk. And the study area of this research is delimited to non-life insurance companies in Ethiopia, and under operation after the fiscal year 2005.

## **1.6. Significance of the Study**

This study is of immense value to insurance companies, academics and other concerned stakeholders. As there is scarcity of empirical studies in insurance industries, some existed studies are mainly focused on examining the determinants of profitability of insurance industry and its contribution to economic growth. Hence this study might fill the gap by examining the effects of risk management on the financial performances of insurance companies in Ethiopia. The result of this study will also serve as a data base for further researchers in this field of research. Further, the observed findings are pertinent for policy-makers, corporate boards, executives and other stakeholders.

## **1.7. Organization of the Paper**

The research paper was organized in to five chapters. Chapter one is background of the study where overview of the insurance industry in Ethiopia, statement of the problem, objectives of the study, hypothesis of the study, scope, and significance of the study presented. Chapter two is review of literature in which theories, empirical evidence and conceptual frame work are identified. Chapter three deals with research methodology, chapter four presented the research results and discussions. Finally, chapter five contained the summary, conclusion and recommendations for the finding.

## **Chapter Two:**

### **Review of Literature**

The word risk is quite modern; it entered the English language in the mid-17th century, coming from the French word *risque* and in the second quarter of the 18th century the Anglicized spelling began to appear in insurance transactions (Flanagan, 1993). Though the term risk has no a single definition, Rejda (2008) defined as, it is uncertainty concerning the occurrence of a loss. According to this definition a risk exist only if an uncertain action or event happens that leads to occurrence of that risk. Although risk and uncertainty are often used interchangeably, there is a distinction between them. Uncertainty is referred to not being sure of what is going to happen in the future and risk is the degree of this uncertainty. In finance, one measure of risk is the probability that the actual return on an investment will diverge from its expected value. How risky an investment is depends on how much the actual return is likely to diverge from its expected value (Clark & Mairos, 1996). Moreover, risk is a phenomenon that by definition and by nature cannot be eliminated.

Risk management is the process of implementing and maintaining appropriate management controls including policies, procedures and practices to reduce the effects of risk to an acceptable level. The principles of risk management can be directed both to limiting adverse outcomes and achieving desirable ones. The process involves identifying, analyzing, assessing, treating and monitoring risk in all areas of agency operations and business (Moeller, 2007). Further more risk management is the process of 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 (Wenk, 2005).

#### **2.1. Theories of Risk Management and Financial performance**

The concept of risk management theory involves studying the various ways by which businesses and individuals raise money, as well as how money is allocated to projects while considering the risk factors associated with them Sarkis (1998). There are a number of theoretical perspectives which are used in explaining the effects of risk management on firm's financial performance. The theories reviewed in this section are contingency planning theory, enterprise risk management theory, managerial self-interest theory and Dupont Theory.

### ***2.1.1. Contingency Planning Theory***

According to Hisnson & Kowalski (2008), contingency planning (CP) also known as business continuity planning is a crucial element of risk management. The fundamental basis of Contingency Planning 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 & Kowalski, 2008).

Riley (2012), defines contingency planning as a forward planning process, in a state of uncertainty, in which scenarios and objectives are agreed, managerial and technical actions defined, and potential response systems put in place in order to prevent, or better respond to, an emergency or critical situation. A contingency plan is meant to help network and coordinate individuals, agencies and organizations to affect a rapid and effective response. Contingency planning ensures the availability of stand-by resources and provides mechanism for rapid decision-making that can shorten disaster response and ultimately save lives.

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.

Therefore, as insurance companies' operations are full of probability, their business transactions and policy contracts are also on contingent basis. If in the policy period no damage/loss is happen, the insurer earns the whole premium which is a rare case, yet if the claim is reported within the policy contract period the compensation should be paid. Both the magnitude of the compensation and the time are not known certainly.

### ***2.1.2. Enterprise Risk Management Theory***

The underlying premise of Enterprise Risk Management (ERM) is that every entity exists to provide value for its stakeholders. All entities face uncertainty and the challenge for management is to determine how much uncertainty to accept as it strives to grow stakeholder value. Enterprise risk management theory is one of the most common frameworks was introduced by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in 2004, which defines ERM as (COSO, 2004) it 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. It also emphasizes that the organizational benefits of risk management can create value for firms (Nocco & Stulz, 2006).

According to Tseng (2007), 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. ERM is an organizational concept that applies to all levels of the organization. Furthermore, a firm's total risk can be reduced, financial distress is less likely (Meulbroek, 2002; Gordon et al., 2009). Traditionally the approach of risk management has been a silo approach in which one risk is managed at a time. In this approach, risk management is purchased without acknowledging the interrelationship of risks. The silo (traditional) risk management causes inefficiencies due to the lack of coordination between the various risk management departments (Hoyt & Liebenberg, 2011). Whereas enterprise risk management is not strictly a serial process, where one component affects only the next. It is a multidirectional, iterative process in which almost any component can and does influence another (COSO, 2004).

Most empirical studies conclude that ERM generally has a significant positive impact on firm value and performance. As opposed to Traditional Risk Management (TRM), where individual risk categories are managed separately in risk silos, ERM allows firms to manage a wide array of risks in an integrated, enterprise-wide fashion (Hoyt & Liebenberg, 2006).

### ***2.1.3. Managerial Self-interest Theory***

This theory was first put forward by Stulz (1984), who argued that firm managers have limited ability to diversify the significant portion of their personal wealth held in the form of stock in the firm and the capitalization of their earnings from the firm. Such managers would prefer stability

of the firm's earnings to volatility because, other things equal, such stability improves their own utility, at little or no expense to other stakeholders. This argument can be traced back to the literature on agency. In this area, the relationship between firm performance and managerial remuneration is clearly developed in such work as Ross (1977).

Demarzo & Duffie (1992), point out that observed outcomes may influence owner perception of managerial talent. This would, in turn, favor reduced volatility, or at least the protection of firm specific market value from large negative outcomes that may be found within the distribution of possible returns. For this, if for no other reason, there appears to be ample justification for the assumption that managers will behave in a manner consistent with a concave objective function. Thus, this theory links risk management and firm performances.

#### ***2.1.4. DuPont Theory***

DuPont analysis, a common form of financial statement analysis, decomposes return on net operating assets into two multiplicative components: profit margin and asset turnover. These two accounting ratios measure different constructs and, accordingly, have different properties. According to Mitchell et al. (2013), the traditional role of DuPont formula is to help rational investors decide on the optimal investments to undertake but has since evolved into a modern tool used to find out the strength, weakness and likely improvement on the capital structure of an organization that will help maximize stock holders' wealth. The first Du Pont model was developed before 1970s when firms' main goal was that of maximizing return on assets (ROA), (Liesz & Maranville, 2013). According to (Liesz & Maranville, 2008), Brown F. D. who was an electrical engineer had been contracted by General Motors company to analyze their finances after which he discovered a relationship that existed between total asset turnover, net profit margin and return on assets. He found out that return on assets is equals to net profit margin multiplied by total asset turnover, which is actually profitability multiplied by efficiency.

Gitman (1998) contend that, in the 1970s the generally accepted goal of financial management became maximizing the wealth of the firm's owners, and focus shifted from return on assets to return on equity (Liesz & Maranville, 2008) which then led to the modified DuPont model now commonly known as, DuPont identity, where return on equity is equals to return on assets multiplied by total assets and divided by equity. This was to cater for the ways institutions leverage their operations and the modern goal of organizations which is maximization of owners' equity. Raza et al. (2013), contend that insurance firms when measured according to their net

income levels do not rank the same as when measured using return on equity and usually the best performers in terms of net income do not manage to perform in terms of return on owners' equity. Policyholders therefore do not like the highly performing insurance firms but the insurers which give them high returns on their investments and hence support DuPont method of measuring an insurance firm's performance (Raza et al., 2013).

## **2.2. Insurance and Risk Management**

The term insurance defined by referring two important schools of thoughts: i) transfer school and ii) pooling school. According to transfer school, "insurance is a device for the reduction of uncertainty of one party, called the insured, through the transfer of particular risks to another party; called the insurer, who offers a restoration, at least in part of economic losses suffered by the insured" (Irving, 1956). On the other hand, according to pooling school "the essence of insurance lies in the elimination of uncertainty or risk of loss for the individual through the combination of large number of similarly exposed individuals" (Alfred, 1935), cited in (Tanveer, 2010). Insurance operates on the principle of pooling risks where the people contribute to a common fund in form of premiums and where the lucky ones who do not suffer loss help the unlucky ones who suffer loss during a defined insurance period (Irukwu, 1994). Insurance is a contract in which the insured transfers risk of potential loss to the insurer who promises to compensate the former upon suffering loss. The insured then pays an agreed fee called a premium in consideration for this promise. The promisor is called the insurer and the promise is called the insured (Lowe, 1999). Insurance premium is the monetary consideration paid by the insured to the insurer for the cover granted by the insurance policy. The Insurer takes on a number of clients (Insured) who pay small premiums that form an aggregate fund called the premium fund (Norman, 2000). The likelihood of an event or loss may be mathematically calculated or it may be based on the statistical results of past experience in order to determine the amount of premiums that would be required to accumulate a common fund or pool, to meet the losses upon their arising (Grose, 1992).

UNCTAD (2007) underlines the insurance industry as one of the pillars of the finance sector that plays a key and dual role (of infrastructural service and commercial service) which are both crucial to the economic development of a country:

- From infrastructural perspective, a well-functioning insurance enables efficient allocation of capital, mobilize and channel savings; support trade, commerce and entrepreneurship and improve the quality of lives of individuals in a given country.
- From a commercial service perspective, insurance companies promote the domestic financial sector, become significant players in the international capital market, and give financial confidence for investments.

It seems Insurance not only facilitates economic transactions through risk transfer and indemnification but it also promotes financial intermediation (Ward & Ralf, 2000). More specifically, insurance can have effects such as promote financial stability, mobilize savings, facilitate trade and commerce, enable risk to be managed more efficiently, encourage loss mitigation, foster efficient capital allocation and also can be a substitute for and complement government security programs (Skipper, 2001). Insurance provides economic protection from identified risks occurring or discovered within a specified period. Insurance is a unique product in that the ultimate cost is often unknown until long after the coverage period, while the revenue premium payments by policyholders are received before or during the coverage period. Insurance is an important growing part of the financial sector in virtually all the developed and developing countries (Das et al., 2003). A resilient and well regulated insurance industry can significantly contribute to economic growth and efficient resource allocation through transfer of risk and mobilization of savings. In addition, it can enhance financial system efficiency by reducing transaction costs, creating liquidity and facilitating economies of scale in investment (Bodla & Garg, 2003).

Some of the contributions of the insurance industry to economic development as (Davies & Podpiera, 2003) state are:

- Insurance promotes financial stability through transfer and pool of risks, thereby encouraging individuals and firms to specialize, create wealth, and undertake beneficial projects they would not otherwise consider.
- Insurance mobilizes savings and channels them to the capital markets, and developing countries with higher savings rates tend to show faster growth and investment.
- Strong insurance can relieve pressure on government budget. It can play an important role in personal retirement planning and health insurance programs, and to that extent can reduce demands on government social security and health programs.

- Insurance supports trade, commerce and entrepreneurial activity to have heavy influence on all economic and commercial activities.
- Insurance may lower the total risk faced by the economy through risk diversification across border as well as to promote risk mitigation activities.
- Insurance improves individuals' quality of life and increase social stability through, for example, individual health, life insurance, pension funds and worker's compensation.

Insurance business is usually divided into two main classes namely: a) General insurance business. This is a contract between an insurer and the insured where by the insurer undertakes to indemnify the insured against losses, which may result from the occurrence of specified events within specified periods. General insurance business can be subdivided into: motor, fire, accident, oil and gas, contractors' all risks and engineering risks; marine and credit insurance, bond and surety ship etc. This is a contract between the insurer and the insured whereby the insurer undertakes to pay benefits to the policy holder on the attainment of a specified event. b) Life assurance business: comprises individual life business, group life insurance and pension business, health insurance business and annuities.

Risk management and insurance are closely related as it is indicated in most literatures. Insurance alone is not risk management rather Insurance Companies are a corporation primarily engaged in the business of providing insurance protection to the public and sale contracts of insurance. Risk management is far broader and includes the concepts of preventing, minimizing, and avoiding losses. In addition, risk management addresses methods other than insurance for transferring the financial consequences of losses that do occur (Stulz, 2004 and Dorfman, 1997). Risk measurement is a fundamental to the insurance industry, from the pricing of individual contracts to the management of insurance and reinsurance companies to the overall regulation of the industry. Insurance services offered by non- life insurance firms do cushion against risks faced by people and non-insurance firm industries (Amaya & Memba, 2015). Transfer of uncertainties to insurance firms by people and non-insurance firm industries is important because risk management is a difficult thing to do by any person as it involves identification of source of risk and then coming up with methodology of quantifying the risk using mathematical models which helps understand risk profile of the person which assists in handling the risk (Kealhofer, 2003). According to Ndwiga, et al. (2012), identifying risk is the first step in the process of risk management and methods used in identifying risks involve tools used to optimize opportunities of knowing hazards inherent in certain systems, facilities or products and the tools are

categorized in broad headings of inductive, deductive or intuitive methods. Organizations are faced with many risks which can emanate from financial variables“ uncertainties, accidental occurrences or even failing of businesses; this can be reduced through risk monitoring and controlling (Saunders, 1996).

In insurance companies, risk management produces as well as the overall quality of management are considered as important factors and together with sufficient financial resources are key factors in protecting against insurance company insolvency. In addition, the process of effective risk management should cover all key elements of the business cycle and more importantly to adequately manage the risks to which the company is exposed.

Effective risk management can bring far reaching benefits to all organizations, whether large or small, public or private sector (Ranong & Phuenngam, 2009) and risk management may reduce or eliminate costly lower-tail outcomes (Stulz, 2003), which may also result in lower expected costs of regulatory scrutiny and external capital (Meulbroek, 2002). 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). Only the amount of quantifiable risks which are beyond the level of risk appetite of the insurance organization needs to be managed by the company at its own. This is the point where an insurance company needs to conceive a better risk management approach, employing sound and fruitful techniques, tools and procedures, which will promise the remarkable returns, thus, satisfying the organizational goals. Laconically, insurance companies resort to the three main ways of managing risks, i.e., Risk Avoidance through business practices, Risk Transference through the construction of portfolios or Diversification and Managing the risk at the firm level by holding the persons accountable. Further, there exist markets for many of these risks borne by the insurance companies. These include catastrophic risk which can be offset by undertaking positions in the catastrophic futures or bonds. Indeed a number of alternatives to minimize the adverse impacts of such risks are under consideration Jaffee & Russell (1997). Generally an insurance organization relies on a number of techniques in their risk management framework. But most prominently, four types of practices evolve as instrumental in managing the risk and thereby improving the financial performance of the organization. These important techniques

include standards and reports, underwriting authority and limits, investment guidelines or strategies, and incentive Schemes. These tools are employed to quantify the risk exposure, spell out the procedures to manage and limit such exposures to the acceptable levels, and manage or motivate the risk managers to manage risk in a way which is consistent with the organizations goals and promises the better performance of the organization.

Danijela & Zeljko (2009) suggested the risk managers to devote their efforts and resources in eliminating or mitigating the risks for sound profitability. Literature further witnesses that the Insurers use hedging instruments to maximize value. Moreover, these instruments are employed to absorb the negative consequences of asset volatility, liquidity, exchange rate and interest rate risks (Cummins et al., 2001). Addressing risks in a more sophisticated manner, Stulz (1996) argued that the theory of risk management, if applied in a well-defined manner will protect the financial companies from the market shocks, bankruptcy and financial distress. Following the basics of risk management, managers in their best capacity can enhance the value of their business undertakings through their productive efforts. Thus, with the help of provisions of risk management, financial institutions can make themselves withstand against the downside movements of risk.

### **2.3. Financial Performance Measurements**

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. It is understood that the primary goal of performance (both financial and non-financial) measurement is to assess the progress of achieving corporate objectives. In addition, the output is utilized to allocate resources appropriately throughout the organization (Christopher, 2003). The analyst or investor may wish to look deeper into financial statements and seek out margin growth rates or any declining debt. If underlying profitability continues to deteriorate, more stock buybacks or debt leverage will be necessary to maintain return on equity, more increasing company exposure to unanticipated downturns in consumer demand or financial market crises. But letting return on equity decline is often too painful to contemplate since the impact on stock performance hence financial performance can be immediate. The risks on the other side are less

immediate and less quantifiable, so there is an understandable temptation to avoid immediate pain (Hagel et al., 2010).

According to Angell & Brewer (2003), financial performance is determined by asset utilization, relative profitability and company's financial leverage. Zenios et al. (1999) stated that profitability analysis focuses on the relationship between revenues and expenses and on the level of profits relative to the size of investment in the business through the use of profitability ratios. Return on equity (ROE) and return on assets (ROA) are two of the most important measures for evaluating how effectively a company's management team is managing the capital that shareholders entrust to it. Return on equity indicates if a company's value is growing at an acceptable rate. It's calculated as annual net income divided by average shareholders' equity, while return on assets reveals how much profit a company earns for every money of assets. It's calculated as annual net income divided by total assets. The return on total assets ratio is 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.

Financial institutions such as banks, insurance companies, securities and credit unions have very different ways of reporting financial information (Flemings, 2004). Insurance companies financial performance can be measured using underwriting and profitability ratios (Flemings, 2004). On the other way, William et al. (2004) argued that the performance of insurance companies in financial terms is normally expressed in net earned premium, 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. On the other hand the return on total assets ratio represents one of the most used methods of quantifying financial performance; it emphasizes the company's ability to efficiently use its assets (Maria, 2014). It reflects the ability of insurance's management to generate profits from the insurers' assets, although it may be biased due to off-balance-sheet activities. Most researchers in the field of insurance and their financial performance stated that the key indicator of a firm's financial performance is ROA. Arif & Showket (2015), Njeru (2013), Catherine (2014), Mike (1999), and Hafiz (2011) are among others, who have suggested that although there are different ways to measure profitability it is better to use ROA as it helps to measure the overall resource (asset) performance.

## **2.4. Risk Management & Financial Performance: An Empirical Review**

Now day's entity stakeholders are demanding greater attention to major risks facing by the entity to ensure that stakeholder value is preserved and boosted. One response to these growing expectations is the development of a new model "Enterprise Risk Management" as an internal control system. At the same time, organizations have been implementing "Performance Measurement System" as one of management control systems vital for corporate success. Subsequently studies have been conducted regarding on risk management, the studies which are conducted in different business sector in general, financial sector and more specifically in insurance industry provided herein under.

The study conducted by Mua et al. (2009); using a sample of Chinese firms, examine the effect of risk management strategy over performance of new product development. Their finding shows that risk management strategies that focus on technological, organizational, and marketing factors, individually and interactively improve the performance of new product development. In addition Gupta (2011) examined the risk management in Indian companies and explore the reasons for the adoption or lack of adoption of integrated approach to risk management using the survey research methodology that includes structured questionnaires and interviews of 130 companies. The study shows that effective risk management can improve organizational performance. Moreover Mohsen et al. (2011) assessed effective risk management and company's performance by emphasizing investment in innovations and intellectual capital. The data had been collected from the companies' financial statements and notes are available in the years of 2003 - 2008. 52 companies from 13 different industries were selected purposefully. Their result indicated that positive and significant relationship between total risk management and company's performance. Other study conducted by Giorgio et al. (2013), the effect of enterprise risk management implementation on the firm value, on a sample of 200 European companies, belonging to both financial and non-financial industries, they did this performing a fixed effects panel regression analysis. They found a positive statistically significant relation between the ERM adoptions and firm value. On the other hand, a study of Tony et al. (2012) investigated enterprise risk management and business performance during the financial and economic crises. It examined 156 non-financial companies listed on the Standard & Poor's (S&P) Toronto Stock Exchange (TSX) Composite Index for 2007 - 2008 and 2008 - 2009 through a content analysis of their annual reports. The study rated risk exposure, risk consequences and risk management

information among types of risks. No conclusive results on the relationship between ERM and firm performance.

Mwangi (2014) studied on the effect of risk management on financial performance of commercial banks in Kenya. Descriptive research design was used in the study. Secondary Data was collected from Central Bank and banks financial reports and multiple regression analysis used in the data analysis. The study found that there was a strong positive relationship between risk management and financial performance of commercial banks in Kenya. The study also found that there was a negative relationship between credit risk, insolvency risk, interest rate sensitivity and financial performance of commercial banks. The study additionally revealed that there was a positive relationship between capital adequacy, size of the banks, operational efficiency and financial performance of commercial banks.

Ahmed et al. (2011) conducted a study on risk management practices and Islamic Banks in Pakistan. The study used credit, operational and liquidity risks as dependent variables while size, leverage, NPLs ratio, capital adequacy and asset management are utilize as explanatory variable for the period of four years from 2006 to 2009. The study concluded that size of Islamic banks have a positive and statistically significant relationship with financial risks, whereas its relation with operational risk is found to be negative and insignificant. The asset management establishes a positive and significant relationship with liquidity and operational risk. The debt equity ratio and non-performing loans ratio have a negative and significant relationship with liquidity and operational risk. In addition, capital adequacy has negative and significant relationship with credit and operational risk, whereas it is found to be positive and with liquidity risk.

Kenny et al. (2014), studied on risk management practices and financial performance: evidence from the Nigerian deposit money banks, the study used secondary data gathered through content analysis of the selected banks' annual reports and accounts. The cross sectional data were analyzed using descriptive statistics to show pattern and robust standard errors OLS regression to estimate significant influence between banks' risk management practices (credit, liquidity, operating and capital risk practices) and their financial performance. Risk management practices have a significant influence on banks' performance. While the credit and capital risk display significant positive influence on ROA.

Catherine (2014), the effects of risk management on financial performance of insurance companies in Kenya, data collected from 44 insurance companies and published reports for a period of 2008 - 2012. The study established that a majority of insurance companies in Kenya had adopted risk management practices in their operations and that this had a strong effect on their financial performance. Risk identification was found the most significant in influencing financial performance, followed by risk mitigation, risk management program implementation & monitoring and risk assessment & measurement respectively. The study concluded that there was a positive relationship between the adoption of risk management practices and the financial performance of insurance companies in Kenya.

Patrick & Florence (2015) influence of risk management practices on financial performance of life assurance firms in Kenya: a survey study of Kisii, the target population was one hundred and eighteen respondents. Census sampling method was used. Questionnaires were used for data collection. Risk management practice is the independent variable which contained; underwriting practice, premium valuation methods, and adjustment provisions of claim liabilities. The findings, Premium valuation methods had positive influence on financial performance of life assurance firms in Kenya. The study established that underwriting guidelines had a positive effect on financial performance of life assurance firms in Kenya. Further 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.

The study conducted by Arif & Showket (2015) relationship between financial risk and financial performance of Indian insurances revealed that capital management risk, solvency risk, liquidity risk, volume of capital and size of company were most important determinants of financial performance of life insurance companies in India, whereas had statistically insignificant relationship with underwriting risk. The study led to the conclusion that underwriting risk was found to have statistically insignificant relationship with financial performance of life insurance companies. And capital management risk, solvency risk and underwriting risk exhibit a negative relationship with financial performance while liquidity risk, size and volume of capital exhibit a positive relationship with financial performance of life insurance companies in India.

Joyce & Willy (2016), studied on effects of risk management practices on financial performance of non-life insurance firms operating in Kisii County in Kenya descriptive survey research

design was used to collect data. Target population was 237 respondents, comprising of 116 directors and 121 senior managers. Stratified random sampling method was used to get the sample. Primary data was collected using a structured questionnaire while secondary data was collected from published reports and financial statements. The study shows that there was a positive relationship between financial performance of non-life insurance companies, risk identification practices, risk mitigation practices and risk monitoring practices. The study concludes that there is a strong relationship between risk management practices and financial performance of insurance companies in Kisii County, Kenya

Musa et al. (2014) examined the relationship between enterprise risk management and organizational performance: evidence from Nigerian insurance industry, using purposive sampling technique, 10 general insurance companies were selected from 49 companies operating in Nigeria. Contingency reserve, shareholders' fund, gross premium and net premium were used as dummies for ERM indicators. Panel data was adopted for a ten year period of 2001-2010. The study reveals that there is joint cause relationship among ERM variables and organizational performance though, individual relationship of the indicators differ. Both contingency reserve and net claims respectively have significant positive impacts on organizational performance. Liquidity ratio has no significant impact on organizational performance. Shareholders' funds have a negative significant impact on organizational performance.

Eric (2005) investigated risk management techniques and financial performance in the insurance sector in Uganda. The findings on the financial performance of the insurance companies for this study show fluctuating ratios as measured by ROE. Likewise a study by Mwangi & Iraya (2014) found that financial performance was positively related to earning assets and investment yield for Kenyan General Insurers and that growth of premiums and size of underwriter were not significantly related to financial performance. Adams & Buckle (2003) argued that highly geared and low liquid Bermuda insurers perform better and that their underwriting risk is directly related to a resilient financial performance.

## **2.5. Related Empirical Studies in Ethiopia**

To the best knowledge of the researcher there is no study on the Ethiopian insurance industry exclusively focused on risk management and financial performance of insurers. In Ethiopian banking industry there are a few studies like Eneyew (2013), Endaweke (2015) and Tsion

(2015). In the case of Ethiopian insurance industry, there are two studies undertaken in relation to risk management techniques and insurers' financial performance. More details are presented in subsequent paragraphs.

Eneyew (2013) conducted his study on the impact of financial risks on the profitability of commercial banks for a total of eight commercial banks in Ethiopia, covering the period of 2000-2011. The study adopted a mixed methods research approach by combining documentary analysis and in-depth interviews. The findings of the study show that Credit risk and liquidity risk have a negative and statistically significant relationship with banks' profitability.

The study conducted by Endaweke (2015) was Risk management and its impact on performance in Ethiopian Commercial Banks, balanced fixed effect panel regression was used for the data of 8 commercial banks in the sample covered the period from 2002 - 2013. The results of panel data regression analysis showed that credit risk management indicator, Liquidity risk management indicator and operational risk indicator had negative and statistically significant impact on banks performance. Capital adequacy ratio had positive statistically insignificant impact on banks performance. In addition to this, analysis of primary data by descriptive statistical tools and on hypothesis testing using regression model, leads the researcher to conclude that banks with good risk management policies have a lower risk and relatively higher return on asset. Finally none performing loan ratio, liquidity ratio and cost to income ratio are significant key drivers of performance of commercial banks in Ethiopia.

Tsion (2015) examined the effectiveness of risk management practice of commercial banks operating in Ethiopia. Information was obtained from 15 purposely sampled commercial banks & adopted concurrent mixed research design. Open and closed-ended questionnaires were administered to 86 respondents from selected commercial banks. The main conclusions of the paper were: risk managers perceive risk management as critical to their banks performance; the types of risks causing the greatest exposures are credit risk, operational risk, liquidity risk, interest rate risk and foreign exchange risk; there was a reasonable level of success with current risk management practices and, banks are utilizing some of the approaches/techniques traditionally used to manage risks. She finally concluded that banks operating in Ethiopia are indeed risk-focused.

Rebuma (2013), studied on risk management techniques and financial performance of Ethiopian insurance companies the purpose of the study was to examine the relationship between applied

risk management techniques and financial performance of the insurance companies in Ethiopia, covering the period of 2002-2011. Correlation analysis was used identify the relationship between risk management techniques and financial performance. The findings of the study indicated that risk management techniques (loss prevention and control, loss financing and risk avoidance) were applied in the Ethiopian insurance companies. However, risk management techniques were not commonly applied among insurance companies. The findings also revealed low increase ROE ratios and a general increase in loss ratios of the insurance companies; i.e. a poor financial performance especially as indicated by the loss ratios. Finally, the study indicated the existence of weak relationship between risk management techniques and financial performance that show ineffective on how risk management techniques are applied to improve performance of the insurance companies.

Likewise, Kokobe & Gemechu (2016), worked on risk management techniques and financial performance of insurance companies in Ethiopia, primary data was collected through questionnaires and secondary data was collected from year-end financial report of the selected company. Primary data was collected from employees and secondary data was collected from financial statements of selected insurance companies and analyzed using Pearson correlation to check the relation between insurance performance and risk management techniques. The result shows that risk management practice and financial performance are not correlated.

## **2.6. Risk Selection and Research Hypothesis**

Rather than taking all the many possible risks insurers facing, the researcher established some relevant and critical risks. Based on the previous empirical studies, insurers' financial performance is influenced by both financial and operational risks. There are so many risks under these two broad categories however the researcher wants to focus on main risks. Under financial risks; liquidity, credit and technical reserve risks. Solvency and market risks are very common financial risks yet solvency risk more the same with liquidity risk in Ethiopian insurance market because the industry contains almost all insurers except two or three have no long term liability, in addition to this their main liability is technical reserve which also considered in this study. Regarding market risk it mainly arises from stock price fluctuation and interest rate volatility but in Ethiopia this is not the case as there are no structured primary and secondary market and the floor interest rate is fixed so the minimum return is known. On the other hand operational risk contains; company size, claim settlement, reinsurance and underwriting risks. Information

Technology risk is a key type of risk now days in developed, emerging, and some developing countries as well, however in Ethiopian insurance industry that is not the case, because only two or three insurers are partially operating with this technology. Therefore taking into consideration the above realities, the selected crucial risks are more emphasized herein under with their corresponding hypothesis.

In light of the challenging capital and insurance market environment, strong enterprise risk management (ERM) is a crucial element in maintaining financial strength and ensuring a safe insurance industry. 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 & Nigro, 1997). In a similar manner, Allen & Santomero (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).

According to Kithinji, (2010) financial risk management practices fall into three major categories; credit risk practices, liquidity risk management practice and market risks. When we look at the insurance industry not only these three risks but also technical reserve risk is the other most crucial risk the reason that the insurance operation is full of contingency due to this much reserves are needed.

Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. It is the risk associated with everyday activities of an organization, which involves the management of the performance of its processes, its people, and its systems, to reach the expected business performance. Operational risks breakdowns in internal controls, which can lead to financial losses through frauds, or failure to carry out operations in timely manner. However, in the case of insurance industry the main operational risks are underwriting, claim settlement, and reinsurance risks. Other aspects of operational risks

include major failure of IT systems but this IT system has not that much using by Ethiopian insurance industry.

Liquidity, technical reserve, company size, claim settlement, reinsurance and underwriting risks are the selected variables based on the above analysis.

#### *a. Liquidity Risk*

Liquidity 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. It measures the ability of managers in insurance and re-insurance companies to fulfill their immediate commitments to policyholders and other creditors without having to increase profits on underwriting and investment activities and/or liquidate financial assets (Adams & Buckle, 2003). 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 (Liargovas & Skandalis, 2008). According to Barney (1997) the test of an insurer's ability to meet financial obligations is the acid test. It tests whether a firm has enough short-term assets to cover its immediate liabilities. Poor liquidity causes investment losses and hence poor financial performance when the insurer must sell assets prematurely to cover claims. Having sufficient cash on hand will ensure that creditors, employees and others can be paid on time. Liquidity risk could include two different types of risk: the risk that an insurance company will become unable to assure itself of adequate funding due to a decline in new premium income caused by a deterioration, etc. of its financial position, or an outflow of funds caused by a big disaster, or it will incur losses because it is forced to sell assets at markedly lower prices than normal and therefore unable to maintain cash flow (capital liquidity risk), and the risk that upheavals, etc. in the market will render it impossible to trade and therefore force the company to engage in transactions at prices that are markedly more disadvantageous than normal (Black et al., 1998).

More empirical findings have confirmed that there is a positive relationship between liquidity ratio and financial performance of insurers (Ambrose & Carroll 1994; Carson & Hoyt, 1995; Chen & Wong, 2004 and Amal et al., 2012). Companies with more liquid assets are less likely to fail because they can realize cash even in very difficult situations. Furthermore Browne et al. (2001) found evidence supporting that performance is positively related to the proportion of

liquid assets in the asset mix of an insurance company. When looking at any company's financial statements and attempting to understand where it stands as regards to its viability, liquidity ratios are quite important. The higher a company's liquidity ratio, the healthier it is. Entities with high debt and low liquidity are more likely to fail and riskier investments. It is therefore expected that insurance companies with more liquid assets will outperform those with less liquid assets.

Therefore liquidity risk is the shortage of liquid asset and the most popular ratio other than current ratio is current liability to current asset which is the exact opposite of current ratio. The ratio current liability to current asset can show easily the liquid asset bases of the current liability. Thus, based on the above theories and empirical studies the researcher formulate the following hypothesis.

*H1: Liquidity risk has negative and significant effect on Ethiopian insurers' financial performance;*

#### ***b. Technical Reserve Risk***

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 outflows is known (Shiu, 2014). Its risk is both holding insufficient technical provisions and holding unjustifiably excessive provisions. Where reserves 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. The insurance technical reserve is calculated as the ratio of net technical reserves to equity, and reflects the potential impact of technical reserves' deficit on equity in the event of unexpected losses. This ratio demonstrates the potential impact of deficiencies in technical reserves due to the occurrence of unexpected losses on the equity (Adams & Buckle, 2003). Moreover, a negative relationship between technical reserve and performance has also been found in Browne et al. (2001). Consequently, a negative linkage between the insurance financial reserve and the insurers' financial performance is expected.

*H2: Technical reserve has negative and significant effect on Ethiopian insurers' financial performance;*

***c. Company Size***

Insurance size is associated with diversification which may impact favorably on risk and product portfolio. On the other hand, increased diversification can reduce risk in the business portfolio thereby reducing returns. Insurers that have become extremely large may exhibit negative relationship between size and profitability as a result of bureaucracy and agency cost. (Hardwick, 1997) suggested that large insurers are likely to perform better than small insurers because they can achieve operating cost efficiencies through increasing output and economizing on the unit cost of innovations in products and process development. The research conducted on the relationship among firm characteristics size and growth by Swiss Re (2008) indicated that large firms are found to grow faster than smaller and younger firms found to grow faster than older firms.

Several studies have been conducted to examine the effect of size on the financial performance of insurance companies. Most of the researchers in insurance have found a positive relationship between size and profitability. For example, Demirguc & Maksimovic (1998) and Sommer (1996) have established a positive correlation between size and profitability. Also, Asimakopoulos et al. (2009) found that the profitability of companies is positively impacted by company size. Browne et al. (2001) has shown empirically that company size is positively related to the financial performance of US life insurance companies. Moreover Almajali et al. (2012) surveyed 25 insurance companies of Jordan during the period 2002-2007 by using a number of basic statistical techniques such as T-test and Multiple-regression. The results showed that Size has a positive statistical effect on the financial performance of Jordanian Insurance Companies.

In this study company size is computed as logarithm of total assets of the insurance company. A positive linkage between company size and its profitability is expected, since larger firms have more resources, a better risk diversification, complex information systems and a better expenses management. Thus, the researcher formulates the following hypothesis:

*H3: company size has positive and significant effect on Ethiopian insurers' financial performance;*

#### ***d. Claim settlement Risk***

Singh (2007) noted that claims are the defining moment in the customer relationship for insurance firms, with a firm's success often defined by one factor: the customer's experience around claims. If a company does not effectively handle its claims service, it can tarnish its image and hence affect the sales and marketing of its insurance products. Insurance company's attitude to claims settlement has in the past provoked a lot of public criticism and even attracted the attention of governments (Harry, 2012). In fact, it is the only reason the consumer (insured) buys an insurance product. Parsons (2005) one of the principal functions of insurance is the settlement of claims. Claims, being the heartbeat of insurance, are the most critical contact the insuring public has with the industry and thus, critical moment of truth that shapes a customer's overall perception of their insurer (Crawford, 2007). Moreover, Christian & Versicherun, (2015) stated that insurance contracts have, in their function and structure, particular characteristics which must be considered in order to ensure an effective claims settlement.

Roff (2004) has point out the claim settlement practices that to all intents and purposes, the claim department can be seen as the "shop window" of the insurance company. It does not matter how cheap an insurance company's premiums are, or how efficiently they conduct their underwriting administration if a claim is not properly and fairly dealt with, this is where an insurer will be judged. Furthermore, Lijadu (2002) stated that the insurance industry in African is bogged down by unwholesome public perception. He stated that the insurance industry is aware of the public's misconstrued image of the insurance sector. Moreover he emphasized this by saying that the insurance industry is perceived as quick to collect premium, slow to pay claims, using small prints to confuse you, providing poor services and engaging in sharp practices. Harrington & Niehaus (2006) who asserted that insurers need to take their claim handling function more seriously because if a claim is handled well, it results to higher customer retention but if handled poorly, policyholders will lose confidence in the insurer and this may damage its most cherished reputation.

Pervan et al. (2012) investigated the claim ratio of Bosnia and Herzegovina insurance industry's profitability. Their findings indicated a strong negative influence of claims ratio on profitability. This also supported by Mirie & Cyrus (2014) financial performance was negatively related to loss ratio. Moreover according to Yusuf (2014) effects of claim cost on insurers' profitability on Nigerian Insurers an inverse relationship exist between loss ratio (claim ratio) and profit before tax. Insurance firms with higher claim ratios should be at greater risk of insolvency. Conversely,

one might expect that firms with lower loss ratios should be better performers, all else equal (Kevin, 2009). Claims erode earnings, and hence the lower the loss ratio, the higher the financial performance. For these reasons, the claim settlement risk and insurances financial performance has a negative relationship and affects significantly.

*H4: Claim settlement risk has negative and significant effect on Ethiopian insurers' financial performance;*

#### ***e. Reinsurance Risk***

Reinsurance is a contract of indemnity against liability by which an insurance company procures another insurance company to insure it against loss or liability by reason of the original insurance. It has a global feature as manifested by economic interdependency, mobility of capital and transactions across borders, sharing regulations, international competition and management; and like any product, it is subject to cycles and fluctuations driven by internal and external factors (Plantin, 2006). It is a secondary market and is the main feature of the non-life insurance in the insurance business industry and is one of a number of options or tools to reduce the financial cost to insurance companies arising from the potential occurrence of specified insurance claims, thus, further enhancing innovation, competition, and efficiency in the marketplace (Patrik, 2001). According to the Chartered Insurance Institute (2004), insurance companies use reinsurance for capacity, business, asset management, catastrophe protection, spread of risk, and market environment reasons, which are all needed at different times in a company's development.

Garven & Lamm (2003) describe reinsurance as both risk management and financial structure decision. In terms of risk management, reinsurance enables the reinsured leverage with skills of analysis and proper and modern way of management of risk portfolios including assessing of underwriting risks, and handling of claims properly and efficiently. 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. 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.

Cummins et al. (2008) analyzed empirically 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. 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).

Retention ratio (net written premium to gross written premium) is the most common ratio in assessing reinsurance risk. Therefore, a positive connection between the retention ratio and the insurers' financial performance is expected, because if insurers retain more premiums, they can increase their income and then intensify their ROA.

*H5: Reinsurance risk has positive and significant effect on Ethiopian insurers' financial performance;*

#### ***f. Underwriting Risk***

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. Sound underwriting guidelines are pivotal to an insurer's financial performance. 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 & Young, 2010).

Underwriting risk is the risk that the premiums collected will not be sufficient to cover the cost of coverage. It comprises a high proportion of an insurer's overall risk. 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 favourable business expansion if it is accompanied by adequate reserving, profitable operations, and stable products mix (National Association of Insurance Commissioner, 2001). Good underwriting 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. The underwriting risk reflects the adequacy or otherwise of insurers' underwriting performance (Adams & Buckle, 2003).

Barth & Eckles (2009) found a negative relationship between premium growth and changes in loss ratios, suggesting that premium growth alone does not necessarily result in higher underwriting risk. Organizations that engage in risky activities are likely to have more volatile cash flows than entities whose management is more averse to risk-taking (Fama & Jensen, 1983). 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. Furthermore, insurance companies with high annual insurance losses will tend to increase their level of corporate management expenses example, claims investigation and loss adjustment costs that could further worsen a decline in their financial performance. Excessive risk-taking could adversely affect the performance of insurance companies. Thus taking the above facts into consideration the researcher expects the following:

*H6: Underwriting risk has negative and significant effect on Ethiopian insurers' financial performance;*

## **2.7. Summary and Knowledge Gap**

This section summarized the existing literature on risk management and insurance performance. Financial performance is influenced by a combination of factors facing the firm; a review of the literature provides evidence as to why firms should concern themselves with risk management. The studies revealed that, the awareness and willingness of companies in managing their risks has definitely increased in the emerging economies due to impact of events such as the European financial crisis. That is, the demand for risk management is increasing, especially in the past few years.

The review of the literatures correspondingly revealed the existence of gap, and shown that a risk management and firm performance is issue that requires further investigation. Different scholars using empirical investigation on the risk management and firm performance are resulting in dissimilar conclusions. For instance, an empirical study by Mohsen et al. (2011) indicated that positive and significant relationship between total risk management and company's performance. On the other hand, Ahmed et al. (2011) conducted a study on risk management practices and Islamic Banks his result was negative and insignificant. Besides a study conducted by Eric (2005) examined the relationship between risk management techniques and financial performance of insurance companies in Uganda. The study was restricted to a single year financial performance data and concluded fluctuating financial performance.

Generally, the lack of study on the risk management and financial performance of insurance companies in Ethiopia and the existence of knowledge gap highly absorbed. Research gaps exist since none of the studies address the effects of risk management on the financial performance of organizations. There are studies on risk management and its effect on the performance of Ethiopian commercial banks like Eneyew (2013), Endaweke (2015) and Tsion (2015) however insurance industry is much more differ from banking as there are many exclusive risks facing by banks (technical reserve, underwriting, claim settlement, reinsurance) in addition the similar risk like liquidity still is not the same by its nature with the banks. Of course there are two studies were conducted as the best knowledge of the researcher in Ethiopian insurance; Rebuma (2013) and Kokebe & Gemechu (2016) both studies focused on risk management techniques and insurers' financial performance. However the researcher not wants to study the techniques but risk managements effect on financial performance of Ethiopian insurers by taking the factors liquidity, technical reserve, company size, claim settlement, reinsurance and underwriting risks. Therefore, this study will investigate the relationship between risk management and financial performance of insurance companies in Ethiopia.

## **2.8. Conceptual Framework**

Smyth (2004) defines a conceptual framework as a framework that is structured from a set of broad ideas and theories that help a researcher to properly identify the problem they are looking at frame their questions and find suitable literature. The conceptual framework of the study will consist of independent variables; liquidity, technical reserve, company size, claim settlement,

reinsurance, & underwriting risk and a dependent variable; the financial performance of insurance firms (ROA).

**Figure 2.1: Conceptual Framework**



*Source: Researcher design based on theories and empirical literature review*

## **Chapter Three:**

### **Research Design and Methodology**

The preceding chapter presented reviews of literature on risk management and insurers financial performance with respect to the theoretical perspectives and prior empirical studies. The results from a review of the literature are used to establish expectations for the relationship of the different factors and it confirms that there was no study conducted on effects of risk management on financial performance of Ethiopian insurers. This chapter outlines and explains the methodology employed to achieve the research objective and test the research hypotheses formulated in the study. First section provides a brief overview of the research design followed section two with the research approach and section three discussed about population and sampling techniques adopted in the study, section four includes actual data sources & collection instruments and then section five present variable measurements. Section six and seven discussed about the model specifications and data presentation and analysis techniques used in the study respectively.

#### **3.1. Research design**

The primary aim of this study is to examine the effects of risk management on the financial performance of insurance industry. To achieve this objective explanatory research design is employed in the study. The explanatory type of research design helps to identify and evaluate the causal relationships between the different variables under consideration (Marczyk et al., 2005). If the objective is to determine which variable might be causing a certain behavior, i.e. whether there is a cause and effect relationship between variables, explanatory research must be undertaken (Shields, 2013).

#### **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 functional or positivist paradigm that guides the qualitative mode of inquiry is based on the assumption that social reality has an objective onto logical structure and that individuals are responding agents to this objective environment (Morgan & Smircich, 1980). Quantitative research is a means for testing objective theories by examining the relationship among variables

(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).

Therefore, based on the above discussions of the three research approaches and by considering the research problem and objective, in this study, the quantitative method is primarily used. However, to have a better insight and gain a richer understanding about the research problem, the quantitative method is supplemented by the qualitative method of inquiry. That is, to get the 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 opens 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).

### **3.3. Population and Sampling Techniques**

The target populations of the study are all insurance companies registered by NBE and under operation in Ethiopia from 2005 to 2015 to allow the researcher to obtain sufficient data for calculating the representative data from each insurer. The eleven years is assumed to be relevant because five years and above is the recommended length of data to use in most finance literatures. Thereafter, to make the balanced panel data structured, i.e. every cross-section follows the same regular frequency with the same start and end dates.

As noted in Jonker & Pennink (2010) it is obvious that researchers are typically unable to study the entire population. Therefore, researchers typically study a subset of the population which known as a sample. The procedure used for drawing the sample from the available lists is the insurance service year profile, for the reason that the study intend to use document sources. Therefore, sample size is decided based on the availability of operating data in the insurance operating in Ethiopia. The sampling techniques can broadly be divided as probability sampling and non-probability sampling (Leedy & Ormrod, 2005). Singh (2006) when the subjects used in

the sample is homogeneous; using purposive sampling technique is appropriate, that is part of non-probability sampling.

A sample of 9 insurance companies are taken from the total population of 17 insurers over 11 years period covering calendar years from 2005 to 2015 to provide for 99 observations (9 insurers \* 11 years) which is well enough to operate regression techniques in customarily minimum of 95 observations is recommended by many researchers. According to Green (1991) for regression models (Eviews, ANOVA, GLM, etc.), where you have  $k$  predictors, the recommended minimum sample size should be  $50 + 8k$  to adequately test the overall model. Therefore the number of observations, 99, provided in this study is above the minimum required of 98 ( $50+8*6$  independent variables = 98) observations to the model  $50+8K$ . Furthermore the researcher believes that the sample size is sufficient to make sound conclusion about the population as far as it covers more than 50% of the total population. In addition to this, the selected insurance companies have significant shares from the total population in terms of total asset, capital and profit before tax. Eleven years average total asset, capital and profit before tax of non-life insurance industry were 3.74billion, 1.04billion and 0.43billion respectively out of these 3.38billion, 0.93billion and 0.39billion were owned by the selected 9 insurers so this also can take us in a conclusion that, the sampled insurers can represent the total population (Ethiopian insurers). The sample size includes Ethiopia Insurance Corporation (EIC), National Insurance Company of Ethiopia (NICE), Awash Insurance Company (Awash), Africa Insurance Company (Africa), Nyala Insurance Company (Nyala), Nile Insurance Company (Nile), Global Insurance Company (Global), United Insurance Company (Unic), and Nib Insurance Company (Nib).

Regarding unstructured interview with NBE's insurance supervision directorate officers, the sample design was non-probability (purposive) sampling method was adopted, to explore the view of regulator officers about the effects of risk management on the financial performance of insurers, some officers are selected according to their position. National Bank of Ethiopia (NBE) is the regulatory body for Ethiopian insurers. Insurance Supervision Directorate (ISD), which is the direct concerned directorate in NBE. From this directorate the researcher interviewed three highest officers, in order to get adequate explanations by using unstructured face-to-face interviews. Their specific positions are one Director, one Principal Insurance Examiner and one Senior Insurance Examiner.

**Table 3.1 Sampled Insurers' Market Share**

Years	Insurance Industry(In 000,000)			The Sampled (9) Insurers(In 000,000)			The Sampled Insurers Share in Per Cent		
	TA	Capital	Profit	TA	Capital	Profit	TA	Capital	Profit
2005	1,298	353	91	1,297	352	91	100%	100%	100%
2006	1,564	544	106	1,565	544	106	100%	100%	100%
2007	1,694	545	122	1,696	546	122	100%	100%	100%
2008	1,960	548	137	1,937	537	134	99%	98%	98%
2009	2,230	610	158	2,197	601	159	99%	99%	101%
2010	2,760	772	306	2,654	739	309	96%	96%	101%
2011	3,450	879	312	3,248	823	300	94%	94%	96%
2012	4,857	1,143	534	4,502	1,067	499	93%	93%	93%
2013	5,932	1,503	852	5,255	1,336	746	89%	89%	88%
2014	7,059	1,960	969	6,016	1,631	865	85%	83%	89%
2015	8,365	2,555	1,131	6,830	2,001	1,011	82%	78%	89%
<b>Total</b>	<b>41,169</b>	<b>11,412</b>	<b>4,718</b>	<b>37,197</b>	<b>10,177</b>	<b>4,342</b>	<b>90%</b>	<b>89%</b>	<b>92%</b>
<b>Average</b>	<b>3,743</b>	<b>1,037</b>	<b>429</b>	<b>3,382</b>	<b>925</b>	<b>395</b>	<b>90%</b>	<b>89%</b>	<b>92%</b>

### 3.4. Source of Data and Data Collection Instruments

The sources of data for this study are mainly from secondary sources, but for the purpose of supporting the finding of the study, primary data were also used to some extent. Secondary data were collected from the audited balance sheet, income statement and revenue account of 9 purposively selected insurers. From these insurers, 11 consecutive years' balance sheet, income statement and revenue account (filed with NBE for the period 2005 to 2015) have been used for the study to examine the effect of risk management on insurers' financial performance.

While primary data on effects of risk management on insurers' financial performance, were collected from the regulatory officers through unstructured face to face interview. Smith et al. (1991) commented that the interview method is the most fundamental of all qualitative methods and is claimed to be the best method for gathering information. The unstructured face to face interview has been used because of its flexibility and also allowing new questions to be bring up during the interview. As a result, the response of the interviewees' for the interview questions is used for supporting the result obtained from analysis of structure record reviews or as arguments.

### **3.5. Variable Measurement**

This section explains the variables used as dependent (explained) and independent (explanatory) variables in this study. The definitions or measurements used for these variables are described as follow:

#### *a. Dependent variable*

The most commonly used financial performance ratios are net profit margin, return on assets (ROA) and return on equity. ROA also resolves a major shortcoming of return on equity (ROE). ROE is arguably the most widely used profitability metric, but many scholars quickly recognize that it doesn't tell you if a company has excessive debt or is using debt to drive returns [www.investopedia.com]. In most of the previous studies on insurance sector, return on assets (ROA) is being used as a proxy of profitability (Ahmed, 2011); (Al-Shami, 2008); (Malik, 2011); (Lee, 2014) and it also can help to measure the whole company's resources. Moreover, the return on assets compares the net earnings of a business to its total assets. It provides an estimate of the efficiency of management in using assets to create a profit, and so is considered a key tool for evaluating management performance. The return on assets ratio can be used to compare the efficiency of asset usage within an industry, since each of these businesses should require roughly the same proportions of assets to sales in order to provide services to customers.

Therefore, this study has intended to measure financial performance by using ROA similar to most of the above mentioned researchers. **ROA= Net profit before tax /Total assets**

### ***b. Independent variables***

This subsection describes the independent variables that are used in the econometric model to estimate the dependent variable. To measure the predictor variables of insurance companies' performance in Ethiopia, six factors are used as independent variables which are extracted from different studies. The variables namely; liquidity, technical reserve, company size, claim settlement, reinsurance and underwriting risk.

**Liquidity risk:** Black et al. (1998) define liquidity ratios as the amount of money that companies and other private entities have on hand at any time available to pay their debt. The liquidity ratio measures retire its liabilities to the firm's ability to use its near cash or quick assets. It measured by **Liquidity Ratio = Current liabilities / Current assets.**

**Technical reserve risk:** Most common reserves in insurance are outstanding claims reserve. Outstanding claims reserve is reserve for reported claims/losses but not yet paid because after reporting time different processes are undertaking like claim investigation, loss assessment and different documentation matters. The reserve held according to the best estimations of the officers. Risk of holding insufficient technical reserve or of holding unjustifiably excessive reserve. 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. A technical reserve is measured by a **Safety ratio = Outstanding claim reserve/Equity.**

**Company size:** is computed as natural logarithm of total assets of the insurance company.

$$CZ = \text{Log (Total asset)}.$$

**Claim settlement risk:** The claims ratio also termed as loss ratio in insurance business is defined as the claims incurred to net premiums earned. Claims settlement or compensation for a loss is the only reason the consumer (insured) buys an insurance product. From insurers point of view low ratio is preferable, since low ratio means low damage/loss/ in any subject matter of non-life insurance product and low claim turnover. It is measured through the losses incurred divided by annual premium earned. This ratio indicates how much percentage of net claims is incurred from the firm's or sectors net earned premium.

$$\text{Claim ratio} = \text{Net claims incurred/Net earned premium.}$$

**Reinsurance risk:** Insurance companies reinsure a certain amount of the risk underwritten in order to reduce bankruptcy risk in the case of high losses. However it may also be sources of risk like estimation error, cost of reinsurance and credit risk from reinsurers. The reinsurance risk is measured by retention ratio.

$$\text{Retention ratio} = \text{Net written premium} / \text{Gross written premium}$$

**Underwriting risk:** The underwriting risk emphasizes the efficiency of the insurers' underwriting activity and it was measured by the change rate of net premium it is measured by percentage change in gross written premium that shows the growth of current net written premium from previous year net written premium in any single insurance firm as well as insurance sector. Proxy for Premium Growth is the percentage increase in Net Written Premiums (NWP). The equation is expressed as follows:  $\text{CNWP} = (\text{GNWP}(t) - \text{GNWP}(t-1)) / \text{GNWP}(t-1)$ . For the purpose of this calculation the researcher lagged one year that means year 2004 is included.

The following table 3.1 presents the summary of the explanatory variables (independent variables) and insurance performance (dependent variable).

**Table 3.2 Description of the Variables**

Variables		Definition/Measure	Expected Result
Dependent	Financial Performance (ROA)	Net profit before tax/ total assets	N/A
Independent	Liquidity risk	Current liabilities / current assets	-
	Technical reserve risk	Outstanding claim reserve/equity	-
	Company size	The natural logarithm of total asset	+
	Claim settlement risk	Claim incurred / premium earned	-
	Reinsurance risk	Net premium / gross premium	+
	Underwriting risk	$(\text{CNWP}_t - \text{CNWP}_{t-1}) / \text{CNWP}_{t-1}$	-

*Source: Compiled by the researcher based on earlier studies*

### 3.6. Model Specification

According to William et al. (2010), model building involves specifying relationships between two or more variables; perhaps extending to the development of descriptive or predictive equations. In order to achieve the objectives of this study, the panel data regression model is used

to identify the relationship between the financial performance of non-life insurance companies and explanatory variables liquidity risk, technical reserves, company size, claim settlement risk, reinsurance risk and underwriting risk. This is because prior studies; the collected panel data is analyzed using descriptive statistics, correlations and multiple linear regression analysis. Mean values and standard deviations are used to analyze the general trends of the data from 2005 to 2015 based on the sector sample of 9 insurance companies and a correlation matrix is also used to examine the relationship between the dependent variable and explanatory variables. In addition, ordinary least square (OLS) is conducted using statistical package “EViews” to determine the most significant and influential explanatory variables affecting the financial performance of the insurance industry in Ethiopia.

Modeling is based on panel data techniques. Panel data or longitudinal data, comprises of both cross-sectional elements and time-series elements; the cross-sectional element is reflected by the 9 different Ethiopian insurance company and the time-series element is reflected the period of study (2005-2015). Panel data is favored over pure time-series or cross-sectional data because it can control for individual heterogeneity and there is a less degree of multi-linearity between variables (Altai, 2005).

In light of the above, to investigate the effect of risk management on insurers’ financial performance, the following general multiple regression model is adopted from different studies conducted on the same area.

The equation that account for individual explanatory variables which are specified for this particular study is given as follows.

$$ROA_{it} = \beta_0 + \beta_1 LQ_{i,t} + \beta_2 TR_{i,t} + \beta_3 SZ_{i,t} + \beta_4 CS_{i,t} + \beta_5 RR_{i,t} + \beta_6 UR_{i,t} + \varepsilon$$

*Source: developed by researcher by reviewing previous research works.*

Where;

ROA = Return on asset;

LQ = Liquidity risk;

TR = Technical reserve risk;

SZ = Company size;

CS = Claim settlement risk;

RR = Reinsurance risk;

UR = Underwriting risk;

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

$\beta_0$  = Intercept

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

$i$  = Insurance company  $i = 1 \dots 9$ ; and  $t$  = the index of time periods and  $t = 1 \dots 11$

### **3.7. Data Presentation and Analysis Techniques**

After the data were collected from National Bank of Ethiopian (NBE) the researcher rearranged and coded the data. The collected panel data are analyzed and interpreted by using descriptive statistic, correlation analysis and multiple regression estimation method. To enhance the robustness of the models and to control the cross section effects of the intercepts the study employed fixed effect regression technics. The simplest types of fixed effects models allow the intercept in the regression model to differ cross-sectionally (Brooks, 2008). The fixed-effects model controls for all time-invariant differences between the individuals, so the estimated coefficients of the fixed-effects models cannot be biased because of omitted time-invariant characteristics.

The study checked whether the proposed empirical model is free from autocorrelation, multicollinearity, heteroskedasticity and normality. As mentioned in Brooks (2008), there are basic assumptions required to show that the estimation technique, OLS had a number of desirable properties, and also so that hypothesis tests regarding the coefficient estimates could validly be conducted. If these Classical Linear Regression Model (CLRM) assumptions hold, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators (BLUE). Therefore, for the purpose of this study, diagnostic tests are performed to ensure whether the assumptions of the CLRM are BLUE or not in the model. If any one of those phenomenon turns out to be present, this would be a violation of a key assumption of OLS regression. To conduct this, the researcher used Eviews 8 software as recommended by Brooks (2008) due to its ability to help researchers to analyze research easily and efficiently. Redundant fixed effect (likelihood ratio) test is also made to ensure that a fixed effect regression technique is appropriate.

## Chapter Four:

### Result and Discussion

This chapter presents the results and analysis of data of selected Insurance Companies in Ethiopia using the annual balanced panel data, where all the variables are observed for each cross-section and each time period. The study has a time series segment covering from the period 2005 up to 2015 and a cross section segment which considered nine Ethiopian insurance companies. The chapter organized into five sections. Section one presents descriptive statistics, section two correlation analysis, section three model specification, section four tests for the classical linear regression model assumptions and section five analysis of results.

#### 4.1. Descriptive Statistics

The descriptive statistics of the dependent and explanatory variables for the sample Insurance Companies were summarized in table 4.1. The total observation of the study was 99. Also, the table shows the mean, standard deviation, minimum and maximum values for the dependent and independent variables.

**Table 4.1: Descriptive Statistics of the Variables**

	ROA	LQ	TR	Ln(TA)	CS	RE	CNWP
Mean	0.09	1.03	0.79	12.32	0.71	0.73	0.25
Median	0.09	1.00	0.76	12.26	0.67	0.74	0.18
Maximum	0.19	2.74	2.57	14.72	5.64	0.87	1.56
Minimum	-0.05	0.43	0.11	10.05	0.29	0.37	-0.41
Std. Dev.	0.05	0.27	0.37	1.04	0.52	0.11	0.31
Observations	99	99	99	99	99	99	99

*Source: Own computation from the financial statements using Eviews 8*

*Note: Return on Asset (ROA), Liquidity (LQ), Logarithm of Total Asset (Ln (TA)), Claim Settlement (CS), Reinsurance (RE) and Change in Net Written Premium (CNWP)*

**Financial performance:** As indicated in the above table 4.1, the financial performance measured by (ROA) shows that Ethiopian insurance company achieved on average a positive (9%) before tax profit over the last eleven years. The mean ROA (9%) indicated that the sampled no-life insurers were out-performed as it was more than the most common international practices

(5%). For the total sample, the range of ROA was a maximum of (19%) and a minimum of (-5%). That means the most successful insurers among the sampled earned 19%. The standard deviation was (5%) of the selected non-life insurers; it means the value of ROA deviate from its mean to both sides by (5%) which indicate there was low variation from the mean. The lower standard deviation is a good indication that most of the observations are concentrated around the mean.

**Liquidity risk:** This test measures the proportion of liabilities covered by cash and quickly convertible investments. It indicates a company's ability to meet its maturing obligations without requiring the sale of long term investments or the borrowing of money. The average value of the liquidity measured by liquidity ratio was (1.03) that was less than the required standard of (1.05). The mean value (1.03) indicates that for each 1.03 birr current liability there was 1 birr current asset to meet obligation. The maximum value and the minimum value were (2.74) and (0.43) respectively for the study period. Wherein, variations between non-life insurers in terms of the given indicator are relatively high, given that its value, individually viewed, ranges from only (43%) to as much as (274%). The value of standard deviation (0.27) indicates a little bit high dispersion from the mean value of liquidity in the case of Ethiopia non-life insurance companies.

**Technical reserve:** The average value of technical reserve as measured by the ratio of safety for net outstanding reserve to equity was (0.79). This implies that on average, reserve for outstanding claims was (0.79) times of equity. The highest technical reserve to equity for a non-life insurance company was (2.57) which are above the maximum standard of (2.5) times and the minimum was (0.11). The dispersion/standard deviation was (0.37) which indicated that there was a high dispersion from the mean value of technical reserve on non-life Ethiopian insurers.

**Company size:** Insurance size measured by logarithm of total asset is used as a proxy. The mean of the logarithm of total assets during the period was (12.32). Size of insurance companies was highly dispersed from its mean value (i.e. 12.32) with the standard deviation of (1.04.) which means it is the most deviated variable from its mean. The maximum and minimum values were (14.72) and (10.05) respectively.

**Claim settlement:** This risk measure by claim ratio indicates how much percentage of net claims is incurred from the insurers' of sectors net earned premium. From insurers point of view low ratio is preferable, since low ratio means low damage/loss/ in any subject matter of non-life insurance product and low claim turnover. Therefore, it is expected that the more having low

ratio is the more generating a good profit. By looking towards table 4.1, the value of claim ratio of the selected non-life insurance companies at maximum, minimum, and average is (5.64), (0.29) and (0.71) respectively. The average (0.71) of claim ratio fits the expected standard of not more than (0.7%). This implies that Ethiopian non-life insurers on average (71%) paid for claims the remaining premium (29%) goes to expenses and net income. Whereas, variations between non-life insurers in terms of the given indicator are very high, given that its value, individually viewed, ranges from only (29%) to as much as (564%). Similarly, the difference in value of claim ratio across the selected samples of non-life insurance companies is (0.52), which shows the values of claim ratio of each sample selected insurance companies are highly far from the samples mean value of claim ratio. Therefore, there is high deviation in value of claim ratio among the study sampled size of nine non-life insurance companies in Ethiopia from their mean value.

**Reinsurance risk:** Although it represents the most important instrument of risk management for insurance companies, reinsurance by itself generates certain risks in terms of the inadequately estimated self-retention limit and arranged reinsurance coverage, but also credit risk, i.e. inability and/or unwillingness of reinsurer to meet its obligations to the insurer. The outputs of the descriptive statistics table 4.1 indicate that the mean of reinsurance risk as proxies by net written premium to gross written premium was (73%) which is slightly higher than the maximum acceptable standard of (70%). This means that on average (73%) of gross written premium is retained by the selected Ethiopian non-life insurers and the remaining (27%) was ceded to the reinsurers. It may be an indicator of the insurers are utilizing their capital properly that means there is no idle capital. The maximum value of premium retention ratio was (87%) and a minimum value of (37%), it is slightly out of the acceptable international practice ranged from (30%) to (70%). The sampled Ethiopian non-life insurers' standard deviation was (11%) low dispersion from the mean value of retention ratio.

**Underwriting risk:** Concerning the underwriting risk variable, as a proxy the percentage increase/decrease in Net Written Premiums (NWP) was (25%), while the accepted value of premium growth range is between (-33% and +33%) in this respect the selected non-life insurers' mean value fall within the acceptable range. On the subject of, the maximum & minimum values of net premium growth rate were (156%) & (-41%) respectively. In which, variations between non-life insurers in terms of the given indicator are very high, given that its value, individually viewed, ranges from only (-41%) to as much as (156%) this indicates that

unstable premium collection. The standard deviation of the selected non-life insurers was (31%), which also indicated that there was high variation.

## 4.2. Correlation Analysis

As noted in Brooks (2008), Correlation between two variables measures the degree of linear association between them. Values of the correlation coefficient are always ranged between positive one and negative one. A correlation coefficient of positive one indicates that a perfect positive association between the two variables; while a correlation coefficient of negative one indicates that a perfect negative association between the two variables. A correlation coefficient of zero, on the other hand, indicates that there is no linear relationship between the two variables.

The most widely used bi-variant correlation statistics is the Pearson product moment coefficient, commonly called the Pearson correlation. The result of the correlation analysis is shown in Table 4.2. It indicates a relationship between financial performance and company size had positive relationship; liquidity ratio, technical reserve (safety ratio), claim ratio, retention ratio, and underwriting risk have negative relationship with insurers' financial performance. No case of multi-collinearity among the independent variables existed. Table 4.2 below provides the Pearson's correlation matrix for the variables used in the analysis.

**Table 4.2: Correlation Matrix**

Covariance Analysis: Ordinary

Date: 12/14/16 Time: 21:26

Sample: 2005 2015

Included observations: 99

Correlation	ROA	LQ	TR	Ln(TA)	CS	RE	CNWP
ROA	1.000000						
LQ	-0.224903	1.000000					
TR	-0.220022	0.406793	1.000000				
Ln(TA)	0.633947	0.131657	0.346714	1.000000			
CS	-0.067093	0.150500	0.113295	0.075014	1.000000		
RE	-0.238459	0.149026	0.010175	-0.377763	0.120922	1.000000	
CNWP	-0.026981	-0.143193	-0.091269	-0.074913	-0.016347	0.103458	1.000000

*Source: Own computation from the financial statements using Eviews 8*

As can see from the above table 4.2, the correlation result between liquidity risks and technical reserve (outstanding claim reserve to equity) had negative correlation with return on asset with

the same coefficient of (-0.22). Likewise, claim settlement risk (loss ratio), reinsurance risk (retention ratio) and underwriting risks had negative relationship with return on asset with a coefficient of (-0.0671), (-0.2384) and (-0.0270) respectively. This indicates that as ratios of liquidity, technical reserve, claim, retention and underwriting rate increases, financial performance measured by (ROA) moves to the opposite direction. In contrary to the above explained variables, the Pearson correlation coefficients of company size (0.6339) had positive relationship with return on asset.

### 4.3. Model Specification Test

There are broadly two classes of panel estimator approaches that can be employed in financial research: fixed effects models (FEM) and random effects models (REM) (Brooks, 2008). The choice between these approaches is done by running a Hausman test and the result is presented as follows.

**Random Effect Model:** The rationale behind random effects model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. Random effect model assume that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables (Oscar, 2007). The result of the test displayed below the table 4.3.

**Table 4.3: Random Effect Test**

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.544235	6	0.7381

*Source: Own computation from the financial statements using Eviews 8.*

The null hypothesis of the test was that the random effect method is the preferred regression method. As shown above in table 4.4, random effect Hausman test provide statistical evidence of P-value of 73 %, which means the random effect estimators are insignificant at significant level of 1%. This implies the null hypothesis has been not rejected as according to Brooks (2008) the p-value for the test is greater than 1%, indicating that the random effects model is appropriate.

**Redundant Fixed Effects Tests:** The fixed-effects model controls for all time-invariant differences between the individuals, so the estimated coefficients of the fixed-effects models cannot be biased because of omitted time-invariant characteristics. One side effect of the features of fixed effects model is that they cannot be used to investigate time-invariant causes of the dependent variables (Oscar, 2007). The pooled regression assumes that the intercepts are the same for each firm. This may be an inappropriate assumption, and Brooks (2008) recommended that we could instead estimate a model with firm fixed effects, which will allow for latent firm specific heterogeneity. The simplest types of fixed effects models allow the intercept in the regression model to differ cross-sectionally. To determine whether the fixed effects are necessary or not, this study run a redundant fixed effects test as recommended by Brooks (2008). The results of the test are summarized in the following Table 4.4.

**Table 4.4: Redundant fixed effect test**

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.923222	(8,84)	0.0000
Cross-section Chi-square	44.284783	8	0.0000

*Source: Own computation from the financial statements using Eviews 8.*

From Table 4.4 we can conclude that, the p-values associated with the test statistics are zero to 4 decimal places, indicating that it is better to employ the fixed effect model.

According to the above tests results both fixed effect and random effect models are allowable, however as noted in Gujarati (2003) if T [the number of time series data] is large and N [the number of cross-sectional units] is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model and random effect model. Hence, the choice here is based on computational convenience. On this score, fixed effect model may be preferable than random effect model (Gujarati, 2003). Since the number of time series (i.e. 11 year) is greater than the number of cross-sectional units (i.e. 9 insurance companies).

Brook (2008) stated that, in the econometric context, a regressor is said to be endogenous if it is correlated with the error term of the data generating process in the population. Endogeneity problems mainly arise due to omitted variables, measurement error of explanatory variables, or if there is a reverse causality between the dependent and the explanatory variables, i.e. the dependent variable causing some explanatory variable as well. A simple fixed effects panel estimator would robust the findings of OLS regression, because the dummy variables included to control for the individual effect automatically control for any time-invariant variable. However, Jean & Michel (2006) suggested that the fixed effects model is preferred in cases where conclusions have to be made on the sample and if the observation (panel data) is less, fixed effects will be more efficient than random effects, while the interests of random effects model are on the overall population.

Therefore, based on the above discussion the fixed effect model is preferable for this study.

#### **4.4. Model Diagnosis**

This section presents the test for the assumptions of classical linear regression model (CLRM) namely the error have zero mean, heteroskedasticity, autocorrelation, normality and multicollinearity. To test multiple regression models, it is necessary to assess whether the collected data violate the key assumptions of regression models because any assumption violations can result in distorted and biased research results (Hair et al., 1998). Accordingly, the data has to meet certain assumptions as indicated below.

**The errors have zero mean:** 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 (Brook, 2008). In this study the model consisted a constant term called an intercept. In addition by including the intercept we can avoid two main undesirable consequences; first, R-

square, could never be negative and second, a regression with intercept parameter could not lead to potentially severe biases in the slope coefficient estimates.

**Heteroskedasticity:** It has been assumed that the error terms are homoscedastic. That is, it assumed that the error terms have a constant variance; otherwise they are said to be heteroskedastic. The presence of heteroskedasticity makes the standard errors too big or too low and hence any inferences made could be misleading. The most popular method, a white,s test has to be made, to ensure that this assumption is no longer violated. If the probability of F-statistics, Observed R-square, and Scaled explained SS of the heteroscedastic white test result is in excess of 5% then there is no hetroscedastic problem. However, if one of these three is fail then there is existence of hetroscedastic problem (Brook, 2008).

**Table 4.5: Heteroskedasticity Test: White**

F-statistic	1.072807	Prob. F(6,92)	0.3846
Obs*R-squared	6.473670	Prob. Chi-Square(6)	0.3723
Scaled explained SS	4.554022	Prob. Chi-Square(6)	0.6021

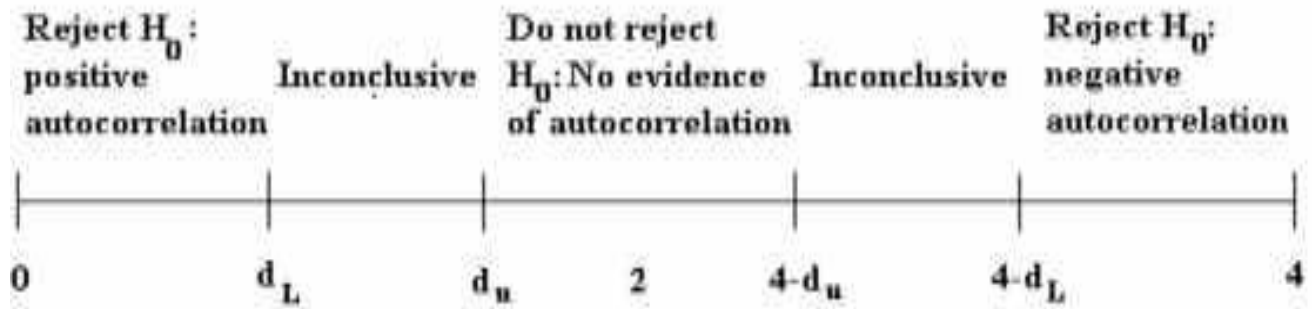
*Source: Own computation from the financial statements using Eviews 8.*

According to the hetroscedastic white test result which is presented on table 4.5 above shows that the probability of F-statistics, Observed R-square, and Scaled explained SS are (38%), (37%), and (60%) respectively. Hence, the probability of F-statistics, Observed R-square, and Scaled explained SS are in excess of 5% and then there is no problem of hetroscedastic. This implies that the assumption of homoscedasticity or errors have a constant variance full filled its requirement. Therefore, the null hypothesis that the variance of the errors is constant (hemoscedasticity) should not be rejected.

**Autocorrelation:** As noted in Brooks (2008) this is an assumption that the covariance between the error terms over time 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. Figure 4.1 below presented the Durbin Watson test for autocorrelation in panel data of this study; the null hypothesis being there is no autocorrelation. Considering the fixed effect regression result and Durbin-Watson 5% significance with 99 observations and 6 explanatory variables (excluding the constant term), the

DW is (2.166). The relevant critical lower and upper values for the test are  $d_L = 1.550$  and  $d_U = 1.803$  respectively. The values of  $(4 - d_U) = 4 - 1.803 = 2.197$ .

**Figure 4.1: Rejection and Non-Rejection Regions for Durbin-Watson Test**



0	1.550	1.803	2.166	2.197	2.45	4
---	-------	-------	-------	-------	------	---

*Source: Own computation from the financial statements using Eviews 8.*

Brook (2008) recommended that not to reject the null hypothesis of no autocorrelation, if the DW test statistic would be in the non-rejection region of the upper limit ( $d_U$ ) and  $(4 - d_U)$ . Thus the DW test statistic of (2.166) is between the upper limit ( $d_U$ ) which is (1.803) and the critical value of  $(4 - d_U)$  i.e. (2.197) indicating that there is no evidence for the presence of autocorrelation and fail to reject the null hypothesis that states there are no serial correlations between the error terms.

**Multicollinearity Test:** Multicollinearity in the regression model suggests that there are substantial correlations among independent variables. This phenomenon presents a problem because the estimates of the sample parameters become inefficient and entail large standard errors, which makes the coefficient values and signs unreliable. It also hides the real impact of each variable on the dependent variable (Anderson et al., 2008). High degrees of multicollinearity can result in both regression coefficients being inaccurately estimated, and difficulties in separating the influence of the individual variables on the dependent variables (Hair et al., 1998). In addition, multiple independent variables with high correlation add no additional information to the model. In order to examine the possible degree of multicollinearity among the explanatory variables, correlation matrixes of the selected explanatory variables were presented in table 4.6. Kennedy (2008) suggested that any correlation coefficient above 0.7 could

cause a serious multicollinearity problem. Therefore, based on the correlation matrix table 4.6 there is no problem of multicollinearity.

**Table 4.6: Correlation Matrix between Independent Variables**

Covariance Analysis: Ordinary

Date: 12/14/16

Sample: 2005 2015

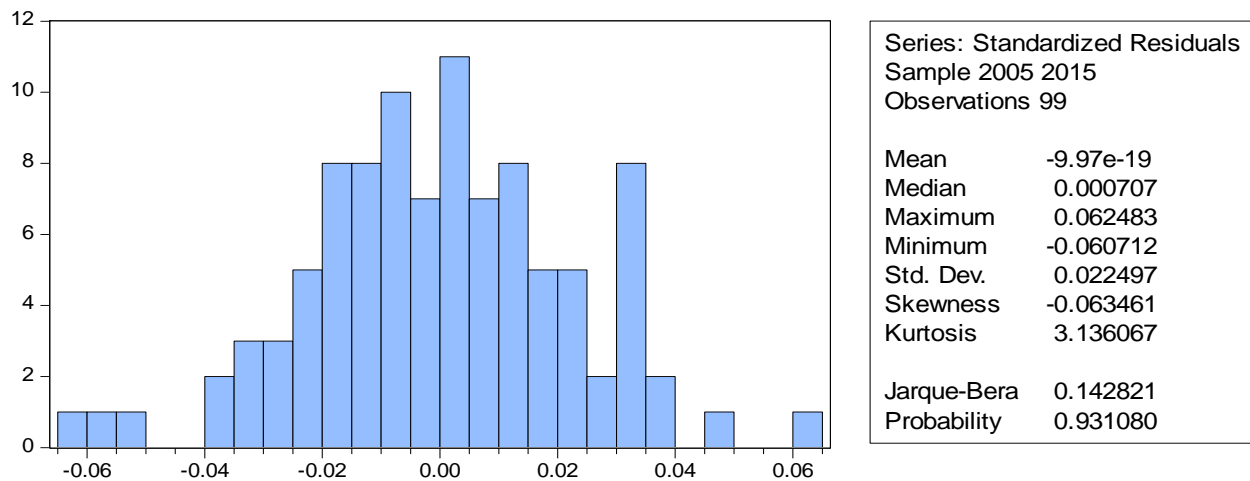
Included observations: 99

Correlation	LQ	TR	Ln(TA)	CS	RE	CNWP
LQ	1.000000					
TR	0.406793	1.000000				
Ln(TA)	0.131657	0.346714	1.000000			
CS	0.150500	0.113295	0.075014	1.000000		
RE	0.149026	0.010175	-0.377763	0.120922	1.000000	
CNWP	-0.143193	-0.091269	-0.074913	-0.016347	0.103458	1.000000

*Source: Own computation from the financial statements using Eviews 8*

**Normality test:** The normality assumption is about the mean of the residuals is zero. In this study, the normality of the data was mainly checked with the popular Bera-Jarque test statistic (Brooks 2008). The Jarque-Bera statistic has a P-value of 93% implies that the p-value for the Jarque-Bera test for the model is very far greater than 5% which indicates that the errors are normally distributed. Furthermore, according to Brooks (2008) the standardized measurements of a distribution are known as its skewness and kurtosis. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how fat the tails of the distribution area. A normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3. Skewness that is normal involves a perfectly symmetric distribution. Kurtosis involves the peakedness of the distribution. Kurtosis that is normal involves a distribution that is bell-shaped and not too peaked or flat. The eviews results for the tests of both Skewness and Kurtosis are presented below figure 4.2 are fitted according to their expected conditions.

**Figure 4.2: Normality Test Result**



*Source: Eviews 8 output*

Based on the statistical results, the study failed to reject the null hypothesis of normality at the 5% significance level.

In general, all tests illustrated above were testimonials as to the employed model was not sensitive to the problems of violation of the CLRM assumption. The required Best Linear Unbiased Estimators (BLUE) conditions are also fulfilled through these assumptions test and discussed in the above section.

#### **4.5. Regression Results and Analysis**

The Fixed effect Model allows for heterogeneity or individuality among the Insurance companies under this study by allowing its own intercept value. This section presents the empirical findings from the econometric output and interview results on the effects of risk management on insurance companies' financial performance in Ethiopia. Table 4.6 below reports regression results between the dependent variable (ROA) and independent variables.

According to Brooks (2008) the standard error of the estimate is sometimes used as a broad measure of the fit of the regression. It is a measure of how confident one is in the coefficient estimate obtained in the first stage. If a standard error is small, the value of the test statistic will be large relative to the case where the standard error is large. Large standard error is undesirable; everything else being equal, the smaller this quantity is the closer is the fit of the line to the actual data. In this study technical reserve, company size, claim settlement and change in net

written premium had small standard error their corresponding standard error amount were (0.0093), (0.0039), (0.0049) & (0.0087).

Moreover, from the findings in the below table 4.6, the value of R-Square, also known as the Coefficient of determination is a commonly used statistic to evaluate model fit. R-squared defined that the square of a correlation coefficient; it must lie between 0 and 1. If this correlation is high, the model fits the data well, while if the correlation is low (close to zero), the model is not providing a good fit to the data. The adjusted R-squared compares the explanatory power of regression models that contain different numbers of predictors and it could control the extremes and the biasedness of the model. The 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 (78%) and (74%) respectively. The result of this estimation particularly the adjusted R-Squared indicates that the changes in the independent variables explain 74.5% of the changes in the dependent variable. This means technical reserve ratio, company size, reinsurance ratio, liquidity ratio, claim settlement ratio and underwriting rate collectively explain 74.5% of the changes in financial performance. Thus these variables collectively, are good explanatory variables to identify the effects of risk management on insurance companies' financial performance in Ethiopia. However, the remaining 25.5% of changes was explained by other factors which are not included in the model.

Overall reliability and validity of the model was further enhanced by the Probability (F-statistic) value (0.000) which indicates strong statistical significance. Thus the null hypothesis of the overall test of significance that all coefficients are equal to zero was rejected as the p-value was sufficiently low (less than 0.05).

**Table 4.7: Regression Result**

Dependent Variable: ROA

Method: Panel Least Squares

Sample: 2005 2015

Periods included: 11

Cross-sections included: 9

Total panel (balanced) observations: 99

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.500195	0.055164	-9.067358	0.0000
LQ	-0.021960	0.010784	-2.036261	0.0449
TR	-0.057336	0.009320	-6.151786	0.0000
Ln(TA)	0.048904	0.003911	12.50357	0.0000
CS	-0.006348	0.004956	-1.280910	0.2038
RE	0.081406	0.034860	2.335216	0.0219
CNWP	-0.008822	0.008752	-1.008011	0.3163

## Effects Specification

## Cross-section fixed (dummy variables)

R-squared	0.781781	Mean dependent var	0.087152
Adjusted R-squared	0.745411	S.D. dependent var	0.048160
S.E. of regression	0.024300	Akaike info criterion	-4.457958
Sum squared resid	0.049601	Schwarz criterion	-4.064758
Log likelihood	235.6689	Hannan-Quinn criter.	-4.298869
F-statistic	21.49527	Durbin-Watson stat	2.166024
Prob(F-statistic)	0.000000		

*Source: Own computation from the financial statements using Eviews 8.*

Table 4.7 above shows that four explanatory variables had significant impact on financial performance of Ethiopian insurers. The significant variables are ranked based on their significant levels; technical reserve risk (claims outstanding to equity), company size (natural logarithm of total asset), reinsurance risk (net written premium to gross written premium) and liquidity risk (current liability to current asset) were significant at 1% and 5% significance level since the p-value for those variables were (0.0000), (0.0000), (0.0219) & (0.0449), respectively.

The negative coefficient of explanatory variables against financial performance are; claim ratio (-0.0063), change in net written premium (-0.0088), liquidity risk ratio (-0.0219) and technical reserve ratio (-0.0573). On the other hand, variables company size and retention ratio (reinsurance risk) had a positive relationship with the financial performance of Ethiopian insurers their respective coefficients were (0.0489), and (0.0814).

Regarding the interview results, in depth interviews were conducted with three officers of National Bank of Ethiopian, by using unstructured face to-face interviews. The three officers interviewed were Insurance Supervision Directorate (ISD) officers. The interview questions were fully unstructured and focused on the identification of effects of risk management on Ethiopian insurance companies' financial performance in general. More specifically, the interview questions tried to identify the major risk factors among the influential factors, how each risk can influence insurers' financial performance, mitigation strategy taken by the ISD to reduce the negative influence of controllable risks and their general opinion regarding the issue of insurers' risk management.

On the question that focuses on the effects of risk management on financial performance, respondents offered some major risks. Almost all the three officers rose about the guideline for risk management program, which drafted by the NBE insurance supervision directorate for Ethiopian insurers, the guideline contained inherent risks of insurance industry. These risks are credit, market, liquidity, technical reserve, underwriting, claim settlement risk, contagion and reinsurance risk. Despite interviewees' responses were varied, the most common factors that affect the financial performance of insurers includes such as; poor estimations for technical reserve, imprudent underwriting practices, highly depend on reinsurers, insufficient liquidity management, poor claim settlement process and in adequate volume of capital.

The financial performance influential risks are individually discussed in the next subsection by referring regression result of table 4.7, interview results and previous empirical studies.

#### **4.5.1. Technical Reserve Risk and Return on Asset**

Technical reserve risk is that the insurance companies' liability to policyholders could be understated or overstated. The liability level is determined by actuarial methods and it depends on future liabilities and structure of insurance portfolio. The high level of technical reserve risk indicator may signal a bad use of capital resources. On the other hand low level of technical reserve risk indicates the insurer unable to pay its obligation in a proper manner this may exposed it to liquidity problem and can lose its clients easily. The most common technical reserve risk in insurance is outstanding claim reserve risk. 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.

The regression result of this study shows that the coefficient of technical provision which is measured by outstanding claim reserve to equity was negative coefficient (-0.0573), which implies that if technical reserve risk increase by 1 unit, ROA will decrease by (0.0573) units assuming that the remaining independent variables are unchanged. The result of (p-value=0.0000) was statistically significant at a 1% significance level. It indicates that when companies holding high reserves for outstanding claims, it will have a significant negative impact on their financial performance.

The result was consistent with Shiu (2014) in UK found that negative relationship between technical provision and profitability of firms. According to the interview results, the major causes of technical reserve risk are management strained by shareholders, claims fluctuation, moral hazard, inflation rate the reason that time difference between claim report and payment settlement, no loss adjuster in the country, capacity limitations of the surveyors and a few number of loss assessors in the country and this may lead to overstatement of current year's financial performance but actually not.

Therefore, current study supports the hypothesis a significant negative impact of technical reserve risk on Ethiopian insurance companies' financial performance. Thus, the null hypothesis can't be rejected.

#### **4.5.2. Company Size and Return on Asset**

The size of the firm affects its financial performance in many ways. Large firms can exploit economies of scale and scope and thus being more efficient compared to small firms. Larger insurers can achieve operating cost efficiencies through increasing output i.e. they are able to realize economies of scale especially in terms of labor costs, which is the most important factor for delivering insurance services.

Company size is computed as logarithm of total assets of the insurance company. The regression result of this study show that the variable size is positively coefficient (0.0489) related to financial performance that means if the size of the company increase by 1 unit, ROA will also increase by (0.0489) units considering that other independent variables remain constant. It also statistically significant (p-value=0.0000) at a 1% level of significance. This indicates that large volume of total asset has a significant effect on insurers' financial performance. Financial performance is likely to increase in large size, because large insurance companies normally have

greater capacity for dealing with adverse market fluctuations than small insurance companies and have more economies of scale, complex information systems and a better expenses management.

The finding of this study is matching with, Malik (2011), Mehari et al. (2013) Chen & Wong (2004) and Shiu (2014). They revealed that large corporate size enables to effectively diversify their assumed risks and respond more quickly to changes in market conditions. An increase in total asset such as the establishment of more branches and the adoption of new technologies enables an insurer to underwrite more policies which may increase the underwriting profit and the total net profit.

The regression result also supported by the NBE's officers, they responds that one of the main reasons the directive issued minimum paid up capital requirement (Directive No. SIB/34/2013) non-life insurers required to increase their capital from 3 million to 60 million was in order to grow insurers' business and increase their retention capacity among the objectives of this directive. If insurers have enough capacity, they can operate massively and this leads them to increase their volume of premium and then their financial performance will increase.

Hence, this study supports the hypothesis that company size has a significant positive effect on insurers' financial performance in Ethiopia and so there is no evidence to reject the null hypothesis.

#### **4.5.3. Reinsurance Risk and Return on Asset**

Reinsurance is insurance for the insurance underwriter. Retention ratio is retained premiums to gross written premiums this means the amount of liability for which an insurance company will remain responsible after it has completed its reinsurance arrangements. The non-life insurance underwriter makes the retention decision based on various factors, including the size and concentration of the individual risk. Insurance companies usually take out reinsurance cover to stabilize earnings, increase underwriting capacity and provide protection against catastrophic losses; nevertheless it involves a certain costs.

The coefficient of reinsurance risk (retention ratio) which is measured as ratio of retained premiums to gross written premium was positive (0.0814) it implies that when retention ratio increase by 1 unit correspondingly insurers' financial performance will also increase by (0.0814). Likewise, reinsurance risk was statistically significant at 5% significance level (p value=0.0219). The significant parameter indicates that the reinsurance risk does affect considerably Ethiopian

non-life insurers' financial performance indicating that its influence is high on insurers' financial performance.

Referring to previous studies, the results concerning reinsurance risk are; Lee (2014) found a significant negative relationship between reinsurance dependence and insurance profits. This means if insurers more ceded their premium their profit will be decline because their retention ratio decreased. Likewise, Shiu (2014) found a negative relationship between reinsurance dependence and insurers profitability which is consistent with this study. Thus, both studies result indicated that reinsurance dependency ratio has negative effect on insurers' profitability and implying that retention ratio has positive impact on insurers' financial performance and this has consistent result with this study result.

The interview result pointed out mixed ideas about the impact of reinsurance risk on Ethiopian insurance companies' financial performance. According to the interviewees, reinsurance has more important for insurance companies' financial performance due to protection against exposure to large or accumulation of losses, additional capacity for insuring big risk, the higher the premium ceded the higher is the reinsurance coverage, but determining an appropriate retention level is important for insurance companies. The other idea was the negative side of reinsurance on Ethiopian insurance companies financial performance is outflow of foreign exchange to reinsurance business which have a negative influence over the insurance industry (costs related to cross-border reinsurance transactions) and economy of the country. To reduce the outflow of foreign exchange, National Bank of Ethiopia issued directives (SRB/1/2014) about reinsurance company establishment in Ethiopia. The objective of this directive is to promote a financial resource mobilization, and reduces cost related to cross-border reinsurance transactions.

The fixed effect regression output also the same with the researcher expected hypothesis as reinsurance risk (retention ratio) has positive and significant impact on Ethiopian insurers' financial performance. Consequently, the null hypothesis failed to reject.

#### **4.5.4. Liquidity Risk and Return on Asset**

The liquidity of insurer is evaluated based on their current liabilities (including unearned premiums and provisions for claims) and the ratio of liquid assets, defined according to different concepts, from cash and cash equivalents, up to short term securities. The study employed the

liquidity ratio which can easily express the liquidity risk that is current asset is a base for current liability which computed as current liabilities to current asset.

The regression result in this study indicates that the relationship between liquidity risk and financial performance is negative coefficient (-0.0219) this shows when liquidity ratio goes up by 1 unit, on average return on asset will goes down by (0.0219) units provided that other independent variables are constant. Beside, this ratio is significant (p-value = 0.0449) at 5% significance level. This infers that more liquid insurance have higher financial performance, all other things remain unchanged. On contrary, if the Ethiopian non-life insurers have more current liability than current asset, their financial performance becomes deteriorate.

The current study is consistent with some previous empirical findings; (Amal, 2012; Browne et al. 2001; Ambrose & Carroll 1994; Carson & Hoyt, 1995 and Chen & Wong, 2004). They suggested that the insurance companies should increase the current assets and decrease current liabilities because; companies with a lower level of liquidity will have more cash constraints and will have more difficulties in repaying to policyholders when loss occurred. Since liquidity measures the ability of insurance companies to fulfill their immediate commitments to policyholders and other creditors without having to sale their fixed asset.

Regarding the impact of liquidity on financial performance, the interviewees revealed that insurance companies by nature must be liquid to meet claims obligation, to avoid loss of business and damage to public image. According to the interviewees major causes of liquidity risk are premium may not collected as expected volume, when the company has no clear cash management policies, lower rate of interest at bank for fixed time deposit & other deposits. The study result also consistent with the National Bank of Ethiopia's issued directive No SIB/25/2004 and the officers view. According to this directive, insurance companies should keep amount of liquid cash and short term securities not less than 65% of total admitted asset to meet their immediate commitments to policyholders. If the insurance companies meet this commitment, they will become sound and increase customer satisfaction and helps to collect more premiums from customers and results increase in financial performance.

Therefore, the regression result is matching with the researcher's hypothesis that is liquidity risk has a significant and negative effect on Ethiopian insurers' financial performance. So the null hypothesis cannot be rejected.

#### **4.5.5. Claim Settlement Risk and Return on Asset**

Yusuf & Dansu (2014) suggest a good claim management embraces: proactive in recognizing and paying legitimate claims; assessing accurately the reserve associated with each claim; reporting regularly; minimizing unnecessary costs; avoiding protracted legal disputation and whatever possible, handling claims expeditiously.

The multiple regression result of this study explains that claim settlement risk measured by claim ratio (net claims incurred to net earned premium) has a negative and insignificant relationship with financial performance (ROA) of Ethiopian non-life insurance, since the beta coefficient and p-value of claim ratio are (-0.0063) and (0.2038) respectively. The negative coefficient indicates that when claim ratio increase by 1 unit ROA will decrease by (0.0063) unit. The result is identical with (Pervan et al. (2012); Mirie & Cyrus (2014) and Yusuf (2014)). Regarding its significances it is not significant even at a 10% significant level, this implies it is not a dominant factor on Ethiopian insurers' ROA.

The interview result also shows that it has a negative effect on financial performance. However one of the officers argued that policyholders main objective is to get compensation for their loss if the insurers settled the claims properly and as much as possible with a short time they can retain their customer and their premium volume will increase and then their financial performance will score high amount.

The fixed effect regression output also the same with the expected hypothesis as claim settlement risk (claim ratio) has negative impact on Ethiopian insurers' financial performance. The hypothesis can't be rejecting because of the same negative impact as expected however it is insignificant.

#### **4.5.6. Underwriting Risk and Return on Asset**

The underwriting risk emphasizes the efficiency of the insurer's underwriting activity and the exposure to financial loss resulting from the selection and approval of risks to be insured. It is a risk of losses from underpriced products, insufficient volume of premium, improper underwriting controls, and the development of new products that are not properly priced.

The coefficient of underwriting which is measured by change in net written premium was negative coefficient (-0.0088) that denotes if the net written premium growth rate goes up by 1 unit, ROA will goes down. Beside probability value of net written premium growth rate was (p-

value=0.3163) statistically insignificant at 10% significance level. Thus the growth rate of net premium was not influential factor of Ethiopian insurers' financial performance.

This finding is consistent with previous studies Lee (2014), Burca & Batrinca (2014). They concluded that underwriting risk has a negative influence on the insurer's profitability, since taking an excessive underwriting risk can affect the company's stability through higher expenses.

The finding is inconsistent with the interview results suggested that underwriting is a fundamental objective to produce profitable book of business. The interviewees indicated that the major causes of underwriting risk are lack of adequate pre risk assessment and risk selection, difficulty of standard criteria for risk evaluation are not up to desirable practice level, most operation managers are production oriented instead of profit oriented. The other basic reason is moral hazard; the possibility that insured's may deliberately cause an insured event or pretend that such an event occurred to obtain insurance payments.

Thus, this study supports the hypothesis that negative impact of underwriting risk on insurance companies' financial performance however it was insignificant which is against the expected result.

By and large this chapter offered the results of the structured recorded data reviews and in depth interview and then discussed the analysis of these results together. From the above data analysis, Ethiopian non-life insurers' financial performance is highly affected by all variables included in this study except claim settlement risk and underwriting risk. The findings of the study showed that liquidity risk and technical reserve risk have statistically significant and negative relationship with Ethiopian non-life insurers' financial performance. However, claim settlement risk has negative and insignificant relationship with financial performance. On the other hand, variables company size and reinsurance risk have a positive and statistically significant relationship with Ethiopian non-life insurers' financial performance.

$$ROA_{it} = \beta_0 + \beta_1 LQ_{i,t} + \beta_2 TR_{i,t} + \beta_3 SZ_{i,t} + \beta_4 CS_{i,t} + \beta_5 RR_{i,t} + \beta_6 UR_{i,t} + \varepsilon$$

Where  $ROA_{it}$  is return on asset of an insurer at time  $t$ ,

$LQ_{it}$  is liquidity ratio of an insurer at time  $t$ ,

$TR_{it}$  is technical reserve ratio an insurer at time  $t$ ,

$SZ_{it}$  is natural logarithm total asset company size an insurer at time  $t$ ,

$CS_{it}$  is claim settlement risk of an insurer at time  $t$ ,

$RR_{it}$  is reinsurance risk of an insurer at time  $t$ ,

$UR_{it}$  is the underwriting risk to an insurer at time  $t$ ,

$\varepsilon$  is the error term of an insurer at time  $t$ .

As generated by regression analysis, shown in table 4.7 above, the established regression equation is:

$$ROA_{it} = -0.5001 - 0.02196LQ_{i,t} - 0.0573TR_{i,t} + 0.0489SZ_{i,t} - 0.0063CS_{i,t} + 0.0814RR_{i,t} - 0.0088UR_{i,t} + \varepsilon$$

## **Chapter Five:**

### **Summary, Conclusion and Recommendation**

This is the last chapter of the research paper and it comprehensively summarizes the whole chapters of the research paper and followed by the conclusion of the study by concluding the major findings of the study. The last part forwards some recommendations that are thought to be practical and feasible.

#### **5.1. Summary**

This study examined empirically the effects of risk management on financial performance of Ethiopian insurance companies. It analyzed by examining available empirical literature reviews conducted in different countries and by selecting 6 variables considering the nature and data availability of the Ethiopian non-life insurance sector. The study attempted to highlight the critical risk management that managers should consider when setting their optimum financial performance. To response the proposed main objective, descriptive statistics, diagnostic tests, selection of appropriate model, multiple regression result and test of hypothesis have been run using statistical package data of “EViews 8”. The appropriate model that has selected for this study was fixed effect model since the diagnostic test of all assumptions are valid and met, as a result it is possible to conclude that the model is adequate, statistically good fit, and data’s were represented reliably.

During the study period Ethiopian non-life insurers maintained an average financial performance (return on asset) ratio of (9%). The mean value of the liquidity measured by liquidity ratio was (1.03) that was less than the required standard of (1.05). The average value of technical reserve as measured by the ratio of safety for net outstanding reserve to equity was (0.79). The mean of the logarithm of total assets during the period was (12.32). The average (0.71) of claim ratio fits the expected standard of not more than (0.70%). The mean of reinsurance risk as a proxy by net written premium to gross written premium was (73%) which is slightly higher than the maximum acceptable standard of (70%).

The study also revealed that there was a joint significant relationship between the risk management variables and Ethiopian insurers’ financial performance. However, the individual relationship differs a bit. Like, claim settlement risk and underwriting risk have no strong

relationship with return on asset. The results of the regression analysis showed negative relationship between the ratio of technical reserve risk and ROA with strong statistical significance. This shows that as minimizing technical reserves risk will certainly improve the insurers' financial performance. A positive relationship between financial performance and retention ratio implies a high retention ratio increases insurance companies' financial performance. The ratio of net claims incurred to net premium earned has a negative impact on ROA. This implies that higher level of claim ratio results in lower financial performance. The logarithm of total assets has a positive impact on financial performance with strong significance coefficient. This indicates that as larger non-life insurance companies of the country experience significantly increases in financial performance through economies of scale. The liquidity ratio has significant and negative influence on insurers' financial performance. On the other hand; underwriting risk has negative impact on the financial performance of Ethiopian companies.

## **5.2. Conclusion**

The study revealed that technical reserve risk, company size, reinsurance risk and liquidity risk were the most influential factors of Ethiopian insurers' ROA, according to their respective order. Giving to the result, the researcher concluded that the main risks affect the ROA of Ethiopian insurers are technical reserve risk, company size, reinsurance risk and liquidity risk, since they have statistically significant impact at confidence level of 99% and 95%. This conclusion implies that non-life insurance companies with high liquid asset, low technical reserve, large total asset, and retain more premium can make more profitable than non-life insurance companies with low liquid asset, large technical reserve, low total asset and low retention. In general managing insurers' risk by itself is difficult task as managing one risk solely may affect the other risks in negative way, so managing risks in insurance companies should goes hand to hand with each other and balancing accordingly is a mandatory. This means enterprise risk management (the enterprise risk management (ERM) theory greatly looks to exert influence on the Ethiopian insurers risk management. It is, therefore, important for this industry to be focused on the integration of the whole company's risks. Similarly, the study concludes that there is a strong relationship between risk management and financial performance of insurance companies in Ethiopia as explained by the model variables explanatory power adjusted R-Square was 74.5%, which means ROA of non-life insurance companies of Ethiopia is explained 25.5% by variables other than the studied variables.

### 5.3. Recommendation

- ❖ Ethiopian non-life insurance companies should pay greater attention to the significant variables of technical reserve, company size, reinsurance and liquidity risk, in order to exceed their financial performance.
- ❖ The researcher recommendations concerning technical reserve risk is the insurers should minimize their outstanding claim reserve through the following mechanisms;
  - Insurers should make frequent adjustments on their outstanding claims reserves by hiring post risk assessors and surveyors.
  - The insurers have to minimize long outstanding claims by quickly pay for claims as much as possible, this can help insurers to avoid inflation cost and other subsequent costs.
  - Insurers should create more awareness on their customers regarding how to protect and minimize from losses and encourage their customers by giving them bonus and discounts.
  - Finally, the insurers should formulate policies and procedures in order to mitigate this technical reserve risk. By doing this they can predict the extents of losses and also protect themselves against future possible losses and payout.
- ❖ Concerning the company size insurers should increase their asset volume with putting in mind that as some times firms become larger they might suffer on inefficiencies and this leading to inferior financial performance.
- ❖ Regarding reinsurance risk insurers should retain as far as their capacity which usually measured by net risk (net written premium to equity). The researcher puts some tools hereunder;
  - First insurers should know their right capacity and to know this they should examine all classes of business. For example in fire and lightning policy the maximum probable loss/estimated maximum loss (EML) should be calculate.
  - Insurers have to provide their stock to the public and existing shareholders up to the extent their holding limit (5% of subscribed capital) that stated in Proclamation No.746/2012, Article No. 12.

- Moreover, Ethiopian insurers have to formulate reinsurance policy and program. This is a key tool when they are arranging reinsurance agreements, as their risk appetite, risk tolerance and other matters are contained in this document.
- ❖ The other concerned issue in this study is liquidity risk. The researcher forwarded the following recommendation.
- Insurers“ have to underwrite more policies by using different marketing tools like extensive promotion with taking in mind intelligent asset utilization system.
  - The recovered assets from their customers in the case of total loss and/or when the damaged couldn“t be economical to repair, insurers should dispose promptly in order to get more cash.
  - Ethiopian insurer should also properly use NBE“s Directive No. SIB/25/2004 that commands the insurers to hold 65% of their admitted asset in the form of cash and short term securities.
  - Whenever insurers want to invest their funds accordingly the above directive, they have to think twice before they put their funds in long term investment. Basically they should do internal rate of return (IRR) which help them to know the potential profitability of the targeted investment.
  - Moreover, the insurers should formulate policy and procedure and have to forecast their cash flows these can help them to utilize their working capital efficiently.
- ❖ The researcher encourages NBE“s Directive No. SIB/25/2004 as it enforces the insurers to have substantial amount (65%) of their admitted asset in the form of cash and short term securities. However, as shown in the descriptive part in previous chapter, the sector was not liquid (1.03) this indicates that NBE should follow continuously for the application of this directive.
- ❖ The researcher also recommends the regulatory body (NBE) regarding technical reserve, Directive No. SIB/38/2014, should be revise because it enforces the insurers to hold 100% reserves for claims under litigations, the researcher believe that this is not fair as the chance for both win and defeat is 50% the reserve also should be 50% in order to provide equitable reserve. Moreover, regarding this risk the regulator have to minimize the licensing requirements for surveyors, loss assessors and adjustors as there is shortage of loss assessor, surveyors and no loss adjustor in the country.



## REFERENCES

- Adams, M, & Buckle, M. (2000). The determinants of operational performance in the Bermuda insurance market. *Applied Financial Economics*, 13, 133-143.
- Adams, M. & Buckle, M. (2003). The determinants of corporate financial performance in the Bermuda insurance market. *Appl. Financ.*
- Agyei, S. K. and Yeboah, B. (2011). Risk management and profitability of banks in Ghana, *British journal of economics, finance and management sciences*, 2 (2).
- Ahmed, N., Ahmed, Z. & Usman, A. (2011). Determinants of Performance: A Case of Life Insurance Sector of Pakistan. *International Research Journal of Finance and Economics*, 61, 123-128.
- Allen, F., & Santomero, A. (1997). The theory of financial intermediation. *Journal of Banking & Finance*, 21 (11), 1461-1485.
- Altai, Y. [2005]. Bank Ownership and Efficiency, *Journal of Money, Credit and Banking*, 33.
- Amaya, P. and Memba, F. (2015). Influence of risk management practices on financial performance of life assurance firms in Kenya: A survey study of Kisii County, *International journal of Economics, Commerce and Management*, 3 (5).
- Andersen, T. (2008). The Performance Relationship of Effective Risk Management: Exploring the Firm-Specific Investment Rationale. *Long Range Planning*, 41(2): 155-176.
- Arif, A. and Showket, A. (PhD) (2015). Relationship between financial risk and financial performance: An insight of Indian insurance industry. *International journal science and research*, 4 (11), 2319–7064.
- Babel, D. & Santomero, A. (1996). Risk Management by Insurers: an analysis of the process. Wharton Financial Institutions Center, Wharton School of the University of Pennsylvania.
- Bandara, R. and Weerakoon, B. (2012). Impact of risk management practice on firm value.
- Barges, A. (1963). The effect of capital structure on the cost of capital: a test and evaluation of the Modigliani and Miller propositions.
- Barth, M. and Eckles, L. (2009). An empirical investigation of the effect of growth on short term changes in loss ratios. *Journal of Risk and Insurance*.

- Bird, M. (2005). VAT in Developing and Transitional Economies (DTEs), International Tax Dialogue, VAT Conference, 15-16 March 2005, Rome.
- Bodla, B. and Garg, P. (2003). Insurance Fundamentals, Environment and Procedures, Deep & Deep Publications Pvt. Ltd.
- Brooks, C. (2008). Introductory Econometrics for Finance, 2nd edn, Cambridge University Press, New York.
- Carson, J. and Hoyt R. (1995). Life insurer financial distress: Classification models and empirical evidence. *J. Risk Insurance.*, 62, 764–775.
- Catherine A. (2014). The effects of risk management on financial performance of insurance companies in Kenya.
- Chen, R. and Wong, K. (2004). The determinants of financial health of Asian insurance companies. *J. Risk Insurance.*, 71, 469–499.
- Christopher, C (2003). Coming up Short on Nonfinancial Performance Measurement, *Harvard Business Review*, 81(11), 88-95.
- Clark, E and Marois, B (1996). *Managing Risk in International Business: Techniques and applications*, International Thomson Business Press.
- Collins, F. (1997). *Effective Techniques for Managing & Handling Insurance Claims*, 1-6.
- COSO (2004). The Committee of Sponsoring Organizations of the Tread way Commission, *Enterprise Risk Management-Integrated Framework Executive Summary*.
- Creswell, W. (2003). *Research design, qualitative, quantitative and mixed methods approaches*, 2nd edn, Sage Publications, California.
- Creswell, W. (2009). *Research design: quantitative, qualitative and mixed methods Approaches*, 3rd edn, Sage Publications, California.
- Cummins, J. Phillips, R. & Smith, S. (2001). Derivatives and corporate risk management: Participation and volume decisions in the insurance industry. *Journal of Risk and Insurance*, 51-91.
- Cummins, D. and Nini, G. (2002). Optimal Capital Utilization by Financial Firms: Evidence from the Property Casualty Insurance Industry. *Journal of Financial Services Research*, 21, 15–53.
- Danijela, M. and Zeljko, S. (2009). Determinants of Hedging Decisions in Croatian and Slovenian large non-financial companies. *Accounting and Finance*.

- Das, S., Nigel D. and Richard P., (2003). Insurance and Issues in Financial Soundness, International Monetary Fund.
- Davies, D. and Podpiera. (2003). Insurance and Issues in Financial Soundness, IMF Working Paper, WP 03:138.
- Demarzo, P. (1992). Corporate incentives for hedging and hedge accounting. Working paper, Northwestern University.
- Dorfman, M. (2007). Introduction to Risk Management and Insurance, The Chartered Insurance Institute of London.
- Endaweke, M. (2015). Risk management and its impact on financial performance of commercial banks in Ethiopia. Thesis presented at Addis Abeba University.
- Eneyew, L. (2013). Financial risks and profitability of commercial banks in Ethiopia. Thesis presented at Addis Abeba University.
- Eric, N. (2005). Risk Management Techniques and Financial Performance in the insurance sector in Uganda, MSc Thesis, presented at Makerere University.
- Ernst, and Young, (2010). Analysis and valuation of insurance companies.
- Fama, F. and Jensen, C. (1983). Agency problems and residual claims, Journal of Law and Economics.
- Flanagan, R. (1993). Risk management and Construction; Black well science Ltd.
- Fleming, M. (2004). The Determinants of Operational Performance and Mitigating the Risks Associated with the Insurance Market', Applied Financial Economics, 13, 133-143.
- Giorgio, B., Elisa, C. and Gloria, G. (2013). The effect of the enterprise risk management implementation on the firm value of European companies, Working Paper 10.
- Gitman, L. (1998). Principles of Managerial Finance, Dorling Kindersley India Pvt. Ltd., Licensees of Pearson Education in South Asia, Delhi.
- Gordon, L. (2009). Enterprise Risk Management and Firm Performance: A Contingency Perspective. Journal of Accounting and Public Policy, 301-327.
- Green, S. (1991). How many subjects does it take to do a regression analysis? Multivariate Behavioral Research.
- Grose, V. (1992) Risk Management from a technical Perceptive: The Geneva Papers on Risk Insurance 12.
- Gujarat, N. (2003). Basic Econometric, 4th edn, USA: McGraw-Hill.

- Gupta, P (2011). Risk management in Indian companies: EWRM concerns and issues', *The Journal of Risk Finance*, 12 (2), 121-139.
- Hailu, Z. (2007). *Insurance in Ethiopia: Historical Development, Present Status and Future Challenges*. Addis Ababa, Ethiopia. Master Printing Press P.L.C.
- Hair, J., Black, W., Babin, B., Anderson, R., and Tatham, R., 1998. *Multivariate data analysis*. Pearson education, New Jersey.
- Haiss, P. and Sumegi, K. (2008). *The Relationship of Insurance and Economic Growth in Europe, A Theoretical and Empirical Analysis*.
- Hoyt, R. and Liebenberg, A. (2006). *The Value of Enterprise Risk Management: Evidence From the U.S. Insurance Industry*.
- Hoyt, R. and Liebenberg, A. (2011). *The Value of Enterprise Risk Management*. *Journal of Risk and Insurance*, 78(4), 795-822.
- Iqbal, Z. and Mirakhor A. (2007). *An Introduction to Islamic Finance: Theory and Practice*, 2nd Edition.
- Irukwu, J. (1977). *Insurance Management in Africa* Caxton press (West Africa) Ltd., Ibadan, 13-20.
- Irukwu, J. (1994). *Insurance Management in Africa* Cayton press (W.A) ltd, Ibadan, Nigeria.
- Jacques, K. and Nigro p. (1997). Risk-Based Capital, Portfolio Risk and Bank Capital: A Simultaneous Equations Approach, *Journal of Economics and Business*, 49, 533–547.
- Jocye, M. and Willy, M. (2016). Effects of risk management practices on financial performance of non-life insurance firms operating in Kisii county, Kenya, *International journal of Social science and project planning management*, 1 (5), 62-74.
- Kadi, A. (2003). Basic Conditions and Procedures in Insurance. *The Accountant*, 13 (3), 16-19.
- Kealhofer, T. (2003). *Survey on corporate responses to volatile exchange rates*, Massachusetts institute of technology, Cambridge, MA.
- Kenny, A., Jumoke O. and Federera O. (2014). Risk management practices and financial performance: evidence from the Nigerian deposit money bank, *The business & management review*, 4 (4).

- Kokebe, S. and Gemechu, D. (2016). Risk Management Techniques and Financial performance of Insurance Companies in Ethiopia. *Journal of Asian and African Social Science and Humanities*, 4 (1) 95-108.
- Lee, H. (2012). An analysis of reinsurance and firm performance, Evidence from the Taiwan property-liability insurance industry, *The Geneva Papers on Risk and Insurance-Issues and Practice*.
- Leedy, P. and Ormrod, J. (2005). *Practical Research: Planning and design*. 8th Ed. Pearson Merrill Prentice Hall.
- Licensing and Supervision of Insurance Business, Directive No. SIB/38/2014, Manner of Reporting Quarterly and Annual Returns. Retrieved from NBE's website, [www.nbe.gov.et](http://www.nbe.gov.et).
- Licensing and Supervision of Insurance Business Directive No. SIB/25/2004, Investment of Insurance Funds.
- Licensing and Supervision of Reinsurance Business, Directive No. SRB/1/2014, Reinsurance Company Establishment.
- Liesz, T. and Maranville, S. (2008). Ratio analysis featuring the du pont method: An overlooked topic in the finance module of small business management and entrepreneurship courses, *Small Business Institute Journal*, 1.
- Lijadu, Y. (2000). Image Committee Admits Hiccups, Plans Robust Insurance. *Insurance post*, 3 (7) 15.
- Lowe, (1999). *Management Research, An introduction*, Sage publications Ltd London.
- Magezi, J. (2003). A new framework for measuring the credit risk of a portfolio. *Institute for Monetary and Economic Studies (IMES)*, 1-45.
- Malik, H. (2011). Determinants of Insurance Companies Profitability: An Analysis of Insurance Sector of Pakistan, *Academic Research International*, 1, (3).
- Mehari, D. and Aemiro, T. (2013). Firm specific factors that determine insurance companies' performance in Ethiopia, *European scientific journal*.9 (10).
- Meulbroek, L. (2002). *Integrated Risk Management for the Firm: A Senior Manager's Guide*.
- Mikes, A. & Kaplan, R. (2014). *Towards a contingency. Theory of Enterprise Risk Management*. Working Paper 13-063.
- Mirie, M. and Cyrus, I. (2014). Determinants of financial performance of general insurance underwriters in Kenya, *International journal of business and social science*, 5 (13).

- Mishkin, S. and Eakins, G. (2013). *Financial Markets and Institutions*, Boston Columbus Indianapolis New York San Francisco Upper Saddle River.
- Mitchell, T., Mitchell, S. and Cai, C. (2013). Using the DuPont Decomposing Process to Create a Marketing Model, *Journal of Business & Economics Research*, 11 (11).
- Moeller, R. (2007). COSO enterprise risk management: understanding the new integrated ERM framework.
- Mohsen, J., Arezoo, A. and Vahid, B. (2011). Effective risk management and company's performance: Investment in innovations and intellectual capital using behavioral and practical approach' *Journal of Economics and International Finance*, 3 (15), 780 – 786.
- Mua, J., GangPengb, Douglas, L and MacLachlan (2009). Effect of risk management strategy on NPD Performance, *Tec novation Paper*, No. 29, 170-180.
- Muller, H. (1997) Solvency of insurance undertakings. Conference of the Insurance Supervisory Authorities of the Member States of the European Union.
- Musa, A., Thomas, I. and Olufemi A. (2014). The relationship between enterprise risk management and organizational performance: evidence from Nigerian insurance industry, *research journal of finance and accounting*, 5 (14).
- National Bank of Ethiopia, Annual Report (2015) of National Bank of Ethiopia.
- Naveed, A., Zulfqar A. and Ahmad, U. (2011). Determinants of Performance, A Case of Life Insurance Sector of Pakistan, *International Research Journal of Finance and Economics*, Eurojournals Publishing.
- Ndwiga, P., Waithaka, S., Gakure, R. and Ngugi, J. (2012). Effect of credit risk management techniques on the performance of unsecured bank loans employed by commercial banks in Kenya, *International journal of business and social research*, 2 (4).
- Nocco, B. and Stulz, R. (2006). Enterprise Risk Management: Theory and Practice. *Journal of Applied Corporate Finance*, 18(4), 8-20.
- Norman, J. (2000). *Insurance Theory Concepts*, University of Caroline. Arnold School of Public Health Administration.
- Oscar, T. (2007). *Panel Data Analysis: Fixed and Random Effects*, Princeton University, 4 (2).
- Parsons, C. (2005). *Chartered Insurance Institute (CII) Coursebook, Insurance Law*, CII learning solutions.

- Patrik, G. (2001). Reinsurance in Causality Actuarial Society: Foundations of Casualty Actuarial Sciences. 4th ed. Arlington, Virginia: Causality Actuarial Society. 343-484.
- Plantin, G. (2006). „Does Reinsurance Need Reinsurance“. The Journal of Risk and Insurance, 73 (1), 153-168.
- Raza, S., Jawaid, S. T. and Adnan, M. (2013). A DuPont Analysis on Insurance Sector of South Asian Region.
- Rebuma, k. (2013). Risk management techniques and financial performance of Ethiopia insurance companies Thesis presented at Addis Abeba University.
- Rejda, G. (2008). Principles of Risk Management and Insurance. 10th ed. New York, Pearson Education.
- Riley, M. (2012), Application of multiple discriminant analysis (MDA) as a credit scoring and risk assessment model, International Journal of Emerging Markets, 6 (2), 132-47.
- Ross, S. (1977). The determination of financial structure: the incentive-signaling approach. Bell Journal of Economics.
- Sarkis, J. (1998). Evaluating Environmentally Conscious Business Practices, European Journal of Operational Research, 107, 59-174.
- Saunders, D. (1996). Credit risk in two institutional regimes: Spanish commercial and savings banks, journal of financial services research, 22 (3).
- Shields, N. (2013). A Playbook for Research Methods: Integrating Conceptual Frameworks and Project Management.
- Singh, K. (2006). Fundamentals of research methodology and statistics, new age international limited, New Delhi.
- Skipper, J. and Harold D. (2001). Insurance in the General Agreement on Trade in Services, AEI Press Washington USA 1-84.
- Smyth, R. (2004). Exploring the Usefulness of a Conceptual Framework as a Research Tool: A Researcher's Reflections. Issues in Educational Research, 14.
- Sommer, D. (1996). The Impact of Firm Risk on Property-Liability Insurance Prices Journal of Risk and Insurance, 63, 501-514.
- Stulz, R. (1984). Optimal hedging policies. Journal of Financial and Quantitative Analysis, 19, 127-140.

- Stulz, R. (1996). Rethinking risk management. *Journal of applied corporate finance*, 9 (3), 8-25.
- Stulz, R. (2003). *Rethinking Risk Management - The Revolution in Corporate Finance*. 4<sup>th</sup> edition. Oxford: Blackwell Publishing.
- Stulz, R (2004). Rethinking risk management, *The Revolution in Corporate Finance*, *Journal of Applied Corporate Finance*, Paper No. 9 (3), 8–24.
- Swiss, R. (2008). Profitability of Non-Life Insurance Industry, Egypt.
- Tony, K. Daniel Z and Michael, M (2012). Enterprise risk management and business performance during the financial and economic crises, *Problems and Perspectives in Management*, 10 (3).
- Tseng, C. (2007). *Internal Control, Enterprise Risk Management, and Firm Performance* Unpublished PhD Dissertation Department of Accounting and Information Assurance. Robert H. Smith School of Business.
- Tsion, F. (2015). *Risk management practice of Ethiopian commercial Banks*. Thesis presented at Addis Abeba University.
- UNCTAD. (2007). *Trade and development aspects of insurance services and regulatory frameworks*. New York and Geneva: UNCTAD (UNCTAD/DITC/TNCD/2007/4).
- Ward, D. and Ralf, Z. (2000). Does insurance promote economic growth? evidence from OECD countries". *journal of risk and insurance*.
- Wenk, D. (2005). *Risk Management and Business Continuity, Overview and Perspective* *Journal of the Chartered Insurance Institute* 3 (3), 234-246.
- William, G. Zikmund, Barry, J. Babin, C and Mitch, G. (2010). *Research Business Methods*, 8 edn. Canada.
- Yuvaraj & Abate G. (2013). performance of insurance companies in Ethiopia, *International Journal of Marketing, Financial Services & Management Research* ISSN.2, (7), 2277- 3622.
- Zenios, S., Forsund, F., Hjalmarsson, L., Suominen, M. (1999), Banking efficiency in the Nordic countries, *Journal of Banking & Finance*, 17 (1).

# Appendixes

## Appendix A: List of Insurance Companies in Ethiopia

No	Name	Establishment date
1	Ethiopian Insurance Corporation	1975
2	National Insurance Company of Ethiopia	23/09/1994
3	Awash Insurance Company	1/10/1994
4	Africa Insurance Company	1/12/1994
5	Nyala Insurance Company	6/1/1995
6	Nile Insurance Company	11/4/1995
7	Global Insurance Company	11/1/1997
8	United Insurance Company	1/4/1997
9	Nib Insurance Company	1/5/2002
10	Lion Insurance Company	1/7/2007
11	Ethio-Life and General Insurance Company	23/10/2008
12	Oromia Insurance Company	26/01/2009
13	Abay Insurance Company	26/07/2010
14	Berhan Insurance Company	24/05/2011
15	Bunna Insurance Company	23/8/2011
16	Tsehay Insurance Company	28/03/2012
17	Lucy Insurance Company	15/11/2012

## Appendix B: Instrument for Unstructured face-to-face interview of NBE officers regarding on the effects of risk on insurance companies' financial performance in Ethiopia

1. What are major risks of Ethiopian insurance industry?
2. How do those variables influence the insurers' financial performance in general?
3. In what extent affect liquidity, technical reserve, company size, claim settlement, underwriting and reinsurance risk to the financial performance of insurance companies?
4. Among the problem that can influence industry's financial performance, which of them is more affects the industry's financial performance?
5. What types of measures are taken as a regulator in order to reduce the influence that affects financial performance negatively?
6. Any idea or comment?

**Appendix C: Sampled Insurers' Total Asset, Capita & Profit (In 000, 000)**

Company	Account	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>EIC</b>	TA	669	773	780	861	960	1,104	1,286	1,785	2,080	2,291	2,470
	capital	109	262	246	225	245	266	261	313	361	425	428
	profit	66	91	102	78	83	147	144	243	344	440	467
<b>NICE</b>	TA	26	32	40	44	51	63	87	144	196	254	281
	capital	7	10	13	15	16	19	18	36	61	67	90
	profit	(1)	2	1	3	2	4	-	11	27	18	34
<b>AWASH</b>	TA	86	106	134	153	182	217	331	469	559	580	648
	capital	34	36	42	46	49	67	86	109	148	178	198
	profit	7	6	9	11	9	24	26	37	83	65	75
<b>AFRICA</b>	TA	109	158	175	230	238	333	431	505	497	547	609
	capital	35	47	44	46	50	64	76	95	109	126	200
	profit	-	12	4	9	11	19	23	27	31	44	44
<b>NYALA</b>	TA	109	124	127	143	151	188	215	308	426	543	747

	capital	52	52	53	52	65	76	91	125	163	215	280
	profit	8	12	12	8	20	26	34	56	70	78	92
<b>NILE</b>	TA	152	181	192	189	195	225	268	364	423	485	574
	capital	53	49	47	44	48	80	94	131	148	164	214
	profit	6	6	4	(5)	4	31	21	37	46	58	81
<b>GLOBAL</b>	TA	23	30	37	44	54	61	65	94	124	154	186
	capital	12	17	19	20	23	25	28	30	44	66	95
	profit	1	1	2	1	3	5	2	2	13	17	25
<b>UNIC</b>	TA	61	88	112	147	173	212	259	358	432	511	556
	capital	25	41	45	56	54	79	90	126	164	194	244
	profit	(1)	8	11	15	8	30	23	44	75	72	73
<b>NIB</b>	TA	62	73	99	126	193	251	306	475	518	651	759
	capital	25	30	37	33	51	63	79	102	138	196	252
	profit	6	3	7	14	19	23	27	42	57	73	120

## Appendix D: Ratio Data Used for Analysis

Year	company	ROA	LQ	TR	TA	CS	RE	CNWP
2005	EIC	0.0986	0.8674	1.1595	668,876	0.5409	0.5941	0.1304
2006	EIC	0.1182	0.8125	0.4934	772,831	0.6662	0.5851	0.1246
2007	EIC	0.1309	0.8283	0.6528	780,053	0.6929	0.6030	0.2406
2008	EIC	0.0909	1.0077	0.7762	860,513	0.7177	0.5761	0.1410
2009	EIC	0.0868	0.9033	0.9033	960,291	0.7297	0.5680	0.1592
2010	EIC	0.1331	0.9198	0.7845	1,104,451	0.6174	0.5105	0.1939
2011	EIC	0.1122	1.0084	0.9646	1,285,641	0.7446	0.5503	0.3706
2012	EIC	0.1366	1.0632	1.1192	1,785,007	0.5591	0.6300	0.7248
2013	EIC	0.1652	1.0333	1.0717	2,080,395	0.6003	0.5174	0.1293
2014	EIC	0.1921	1.0154	0.8813	2,291,004	0.5959	0.6293	0.1214
2015	EIC	0.1891	1.0569	0.8672	2,470,166	0.6251	0.7080	0.1792
2005	NICE	-0.0471	1.4177	1.1612	25,582	0.8415	0.7608	0.2715
2006	NICE	0.0620	1.3659	0.8475	31,517	0.6539	0.8549	0.1743
2007	NICE	0.0209	1.0537	0.9227	39,625	0.6459	0.8683	0.1946
2008	NICE	0.0572	1.0736	0.7264	43,869	0.6740	0.8112	0.0812
2009	NICE	0.0463	1.2327	0.8073	51,127	0.6813	0.7943	0.1164
2010	NICE	0.0588	1.0080	0.8421	63,029	0.6773	0.7582	0.2562
2011	NICE	0.0029	0.8924	2.5665	86,516	0.7276	0.8147	0.3379
2012	NICE	0.0756	0.9501	0.7891	144,488	0.5405	0.8076	0.6649
2013	NICE	0.1393	0.8317	0.6708	196,391	0.5903	0.7925	0.1077
2014	NICE	0.0695	0.8903	0.8385	254,255	0.7002	0.8153	0.0799

2015	NICE	0.1219	0.8278	0.8582	280,679	0.5620	0.8314	0.1282
2005	AWASH	0.0812	0.8658	0.5121	86,481	0.5548	0.8586	1.4654
2006	AWASH	0.0604	0.9053	0.4540	106,150	0.6602	0.7731	0.2214
2007	AWASH	0.0650	1.0109	0.6250	134,435	0.7769	0.8312	0.3739
2008	AWASH	0.0685	1.2238	0.8102	153,342	0.7014	0.8280	0.1537
2009	AWASH	0.0519	1.2729	1.0127	181,927	0.8145	0.7884	0.0898
2010	AWASH	0.1110	1.2017	0.9011	216,853	0.6249	0.8092	0.2311
2011	AWASH	0.0795	1.2745	0.9483	330,811	0.6165	0.8082	0.4719
2012	AWASH	0.0794	1.1755	1.3910	468,690	0.6612	0.7298	0.4303
2013	AWASH	0.1485	1.1248	1.2153	558,710	0.5905	0.8211	0.2074
2014	AWASH	0.1116	1.1615	1.0402	579,675	0.6295	0.7951	-0.0075
2015	AWASH	0.1161	1.2017	0.9616	647,717	5.6381	0.8252	0.1816
2005	AFRICA	-0.0037	0.8954	0.8788	108,982	0.7345	0.7358	0.0983
2006	AFRICA	0.0732	0.8613	0.6882	158,141	0.6016	0.6832	0.1808
2007	AFRICA	0.0204	0.9231	0.8767	174,629	0.8072	0.6696	0.1938
2008	AFRICA	0.0373	1.0010	1.1165	229,943	0.8175	0.7190	0.3904
2009	AFRICA	0.0478	1.0682	1.2872	238,005	0.8283	0.7392	0.1661
2010	AFRICA	0.0579	1.1248	1.2174	333,438	0.8155	0.7255	0.4238
2011	AFRICA	0.0530	1.2090	1.3935	430,842	0.8200	0.7650	0.4623
2012	AFRICA	0.0532	1.4887	1.5086	505,285	0.8540	0.7414	0.3598
2013	AFRICA	0.0619	1.8413	1.5200	496,643	0.8535	0.7925	-0.0358
2014	AFRICA	0.0804	1.5830	1.5166	546,970	0.8952	0.7431	-0.0445
2015	AFRICA	0.0720	2.7428	0.9395	609,489	0.8098	0.7448	0.0381

2005	NYALA	0.0720	0.9227	0.4411	109,152	0.4903	0.7623	0.1080
2006	NYALA	0.0945	0.8364	0.6300	123,839	0.5932	0.8085	0.2940
2007	NYALA	0.0972	0.9284	0.6048	126,676	0.5240	0.7599	0.0784
2008	NYALA	0.0557	1.0287	0.8249	142,996	0.6822	0.8105	0.2506
2009	NYALA	0.1340	1.1034	0.6730	151,172	0.6171	0.7378	-0.1253
2010	NYALA	0.1377	1.0180	0.6311	187,778	0.5886	0.6219	0.1304
2011	NYALA	0.1591	0.9827	0.5407	215,232	0.5484	0.6698	0.1887
2012	NYALA	0.1820	0.9095	0.4191	308,079	0.4094	0.7243	0.4502
2013	NYALA	0.1647	0.8754	0.6298	426,363	0.4608	0.6493	0.1684
2014	NYALA	0.1434	0.8213	0.5978	542,608	0.4197	0.6657	0.0723
2015	NYALA	0.1227	0.8035	0.7452	746,621	0.5722	0.6725	0.1969
2005	NILE	0.0412	1.1921	0.6799	152,397	0.7245	0.8191	0.0724
2006	NILE	0.0357	0.9794	0.9930	181,091	0.7373	0.7803	0.1818
2007	NILE	0.0227	1.1350	1.3161	191,909	0.8550	0.8270	0.1650
2008	NILE	-0.0265	1.4614	1.4956	188,611	0.8304	0.8159	-0.0201
2009	NILE	0.0217	1.3919	1.1953	194,973	0.6938	0.7338	-0.0013
2010	NILE	0.1379	1.0782	0.6235	225,030	0.5737	0.8162	0.3100
2011	NILE	0.0791	1.0371	0.5008	267,595	0.7145	0.8465	0.3688
2012	NILE	0.1020	0.9182	0.4954	364,175	0.7051	0.8530	0.4597
2013	NILE	0.1096	0.9002	0.7620	423,111	0.7303	0.8290	-0.0657
2014	NILE	0.1187	0.9175	0.7477	485,322	0.7006	0.8576	0.2095
2015	NILE	0.1409	0.8670	0.6488	574,291	0.6856	0.8749	0.1638
2005	GLOBAL	0.0404	0.4453	0.1052	23,072	0.4279	0.7042	0.3839

2006	GLOBAL	0.0432	0.4336	0.1121	30,376	0.5568	0.7431	0.4628
2007	GLOBAL	0.0546	0.6480	0.1292	36,658	0.5028	0.7105	0.0958
2008	GLOBAL	0.0140	1.1812	0.1757	44,267	0.5119	0.7395	0.2566
2009	GLOBAL	0.0541	1.0396	0.2175	53,996	0.5056	0.7110	0.0095
2010	GLOBAL	0.0805	1.1912	0.1829	60,772	0.4413	0.7697	0.3471
2011	GLOBAL	0.0364	1.0876	0.2570	65,360	0.8406	0.7441	0.4445
2012	GLOBAL	0.0203	1.0918	0.5911	93,596	0.9519	0.7624	0.9531
2013	GLOBAL	0.1041	0.8811	0.5254	124,206	0.5682	0.7721	-0.0425
2014	GLOBAL	0.1107	0.7397	0.3093	154,087	0.6328	0.7798	0.1566
2015	GLOBAL	0.1364	0.6128	0.2375	186,437	0.6990	0.7953	0.2026
2005	UNIC	-0.0156	0.9843	0.6934	61,443	0.7379	0.7686	-0.1438
2006	UNIC	0.0922	0.8090	0.4735	87,612	0.6784	0.8098	0.5144
2007	UNIC	0.1002	0.8997	0.6558	111,541	0.7202	0.7336	0.5326
2008	UNIC	0.1017	0.9035	0.7362	147,443	0.5878	0.7076	0.3097
2009	UNIC	0.0472	0.9739	1.0010	172,717	0.7707	0.6628	-0.0269
2010	UNIC	0.1409	0.8551	0.7027	212,105	0.5826	0.7217	0.1928
2011	UNIC	0.0874	0.8408	0.7898	258,928	0.7130	0.7232	0.2916
2012	UNIC	0.1219	0.8030	0.6802	358,303	0.6413	0.7174	0.4643
2013	UNIC	0.1732	0.7884	0.6520	432,240	0.5436	0.7166	0.0403
2014	UNIC	0.1412	1.0975	0.5877	511,163	0.5329	0.7403	0.1385
2015	UNIC	0.1306	1.3724	0.4364	555,786	0.5326	0.7347	0.0726
2005	NIB	0.0919	1.0178	0.2002	61,735	0.7684	0.5581	0.0676
2006	NIB	0.0467	0.9951	0.2998	72,815	1.5440	0.4618	0.1669

2007	NIB	0.0757	0.9487	0.3665	98,717	0.6671	0.8299	1.5622
2008	NIB	0.1122	1.1665	0.6415	126,142	0.6611	0.8610	0.5646
2009	NIB	0.0975	1.0609	0.8378	193,192	0.6809	0.8580	0.3110
2010	NIB	0.0934	1.0207	0.8669	251,284	0.6633	0.8239	0.2573
2011	NIB	0.0899	1.0001	0.9368	305,682	0.2909	0.3854	-0.4118
2012	NIB	0.0885	1.0316	1.0765	475,192	0.2995	0.5258	1.1123
2013	NIB	0.1112	0.9508	1.0261	517,607	0.3029	0.3661	-0.3434
2014	NIB	0.1127	0.9026	0.9189	651,237	0.6975	0.4216	1.3462
2015	NIB	0.1591	0.9096	0.7479	759,032	0.6765	0.5924	0.0698

## Appendix E: Regression Results For effects of risk management on insurance companies financial performance

Dependent Variable: ROA

Method: Panel Least Squares

Date: 12/27/16 Time: 04:33

Sample: 2005 2015

Periods included: 11

Cross-sections included: 9

Total panel (balanced) observations: 99

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.500195	0.055164	-9.067358	0.0000
LQ	-0.021960	0.010784	-2.036261	0.0449
TR	-0.057336	0.009320	-6.151786	0.0000
Ln(TA)	0.048904	0.003911	12.50357	0.0000
CS	-0.006348	0.004956	-1.280910	0.2038
RE	0.081406	0.034860	2.335216	0.0219
CNWP	-0.008822	0.008752	-1.008011	0.3163

### Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.781781	Mean dependent var	0.087152
Adjusted R-squared	0.745411	S.D. dependent var	0.048160
S.E. of regression	0.024300	Akaike info criterion	-4.457958
Sum squared resid	0.049601	Schwarz criterion	-4.064758
Log likelihood	235.6689	Hannan-Quinn criter.	-4.298869
F-statistic	21.49527	Durbin-Watson stat	2.166024
Prob(F-statistic)	0.000000		

## Appendix F: Redundant Fixed effect Tests

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.923222	(8,84)	0.0000
Cross-section Chi-square	44.284783	8	0.0000

## Appendix G: Heteroskedasticity Test: White

### Heteroskedasticity Test: White

F-statistic	1.072807	Prob. F(6,92)	0.3846
Obs*R-squared	6.473670	Prob. Chi-Square(6)	0.3723
Scaled explained SS	4.554022	Prob. Chi-Square(6)	0.6021

Test Equation:

Dependent Variable: RESID<sup>2</sup>

Method: Least Squares

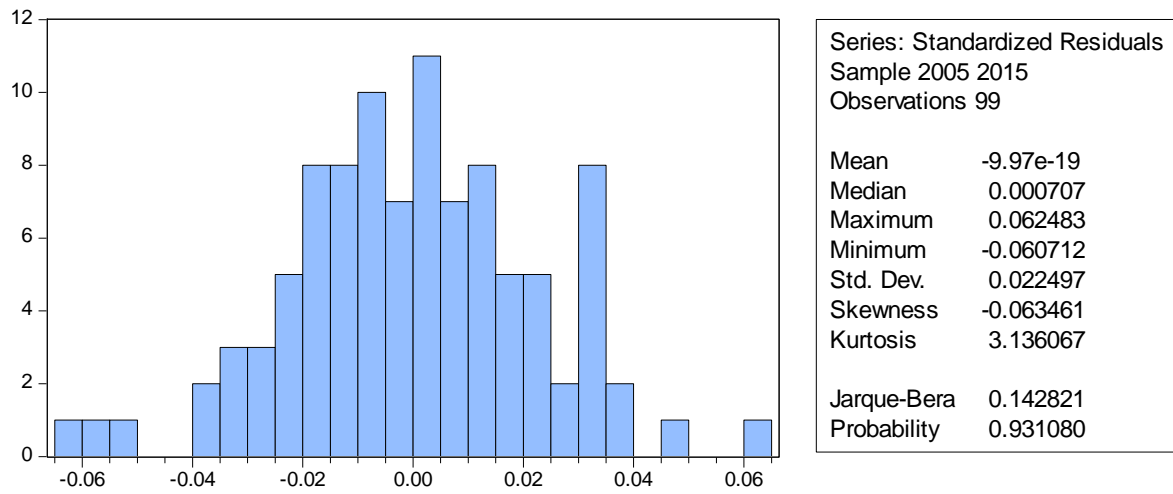
Date: 12/30/16 Time: 00:52

Sample: 1 99

Included observations: 99

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002140	0.000931	2.298849	0.0238
LQ <sup>2</sup>	-8.13E-05	0.000133	-0.611414	0.5424
TR <sup>2</sup>	0.000147	0.000132	1.110724	0.2696
Ln(TA) <sup>2</sup>	-7.61E-06	4.50E-06	-1.691340	0.0942
CS <sup>2</sup>	5.05E-06	3.26E-05	0.155015	0.8771
RE <sup>2</sup>	-0.000279	0.000786	-0.354488	0.7238
CNWP <sup>2</sup>	-0.000416	0.000259	-1.602721	0.1124
R-squared	0.065391	Mean dependent var		0.000784
Adjusted R-squared	0.004438	S.D. dependent var		0.001005
S.E. of regression	0.001003	Akaike info criterion		-10.90335
Sum squared resid	9.26E-05	Schwarz criterion		-10.71985
Log likelihood	546.7157	Hannan-Quinn criter.		-10.82911
F-statistic	1.072807	Durbin-Watson stat		1.807764
Prob(F-statistic)	0.384601			

### Appendix H: Normality test



### Appendix I: Autocorrelation test

