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**SAINT MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES**

**DETERMINANTS OF NON LIFE INSURANCE PREMIUM GROWTH
OF PRIVATE INSURANCE COMPANIES IN ETHIOPIA**

**BY
ADANE SEYOUM**

**JUNE, 2017
ADDIS ABABA, ETHIOPIA**

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BY

ADANE SEYOUM

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STATEMENT OF DECLARATION

The researcher declared that this thesis of MBA degree in Accounting and Finance at St. Mary's University which was done independently with the advice and suggestions of my advisor, Habtamu Berhanu (PhD), Assistant Professor, is my original work and had not been previously submitted for a degree at this or another university and that all reference materials contained therein have been duly acknowledged.

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Adane Seyoum

June, 2017

ACRONYMS/ABBREVIATIONS

| | |
|------|-----------------------------------|
| CLRM | Classical Linear Regression Model |
| DL | Lower Bound |
| DOI | Dependency on Intermediaries |
| DU | Upper Bound |
| DW | Dublin Watson |
| GDP | Gross Domestic Product |
| GMM | Generalized Method of Moments |
| GWP | Gross Written Premium |
| HO | Null Hypothesis |
| INF | Inflation |
| INR | Investment Return |
| LOR | Loss Ratio |
| NBE | National Bank of Ethiopia |
| NBR | Number of Branches |
| OLS | Ordinary List Square |
| REM | Random Effects Models |

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Abstract

There are many reasons for non life insurance premium to increase or decrease. These influential factors and their degree of sensitivity differ from country to country and from period to period. In this study the researcher studied some of the influential factors that are assumed to be the most determinant factors. These influential factors that are assumed and studied are macroeconomic and firm specific factors. Among macroeconomic factors gross domestic product (GDP), foreign direct investment (FDI) and inflation were selected to be studied. Among firm specific factors, solvency, loss ratio, investment return, number of branches and dependency on intermediaries were taken to be studied.

In the course of literature review the researcher found that extensive studies were not done in the determinants of non life insurance premium growth especially in Ethiopia. Moreover, according to the researcher, there was limited firm specific factors were studied in the quantitative research of the subject matter. The researcher suggests more research yet to be done in the field of study mentioned. The study contributes its part in narrowing the gap of research and would serve as a reference for future study to be conducted on the same topic. More importantly the researcher believes that the study result benefits insurance companies and other stakeholders to draw more attention in areas associated with determinants of non life insurance premium growth.

This study is limited to the quantitative analysis. The population of the study was non life insurance premium of private insurance companies after the downfall of Derg regime. The sample taken for the study covered 14 years of data collected from 8 private insurance companies in Ethiopia. Statistical regression analysis is employed to confirm the determinant factors. Accordingly, generalized method of moments (GMM) model was used for estimation. As Ethiopia's economy is emerging economy in the period under review, the study confirmed the determinant factors for non life insurance premium in such economic situation. Based on the study result gross domestic product (GDP), foreign direct investment (FDI), dependency on intermediaries and investment return were found positive influential factors of non life insurance premium of private insurance companies of Ethiopia for the period under review.

Keywords: *Firm Specific Factors, Macroeconomics, Non Life Insurance Premium*

CHAPTER ONE

1. Introduction

1.1. Overview of Non Life Insurance in Ethiopia

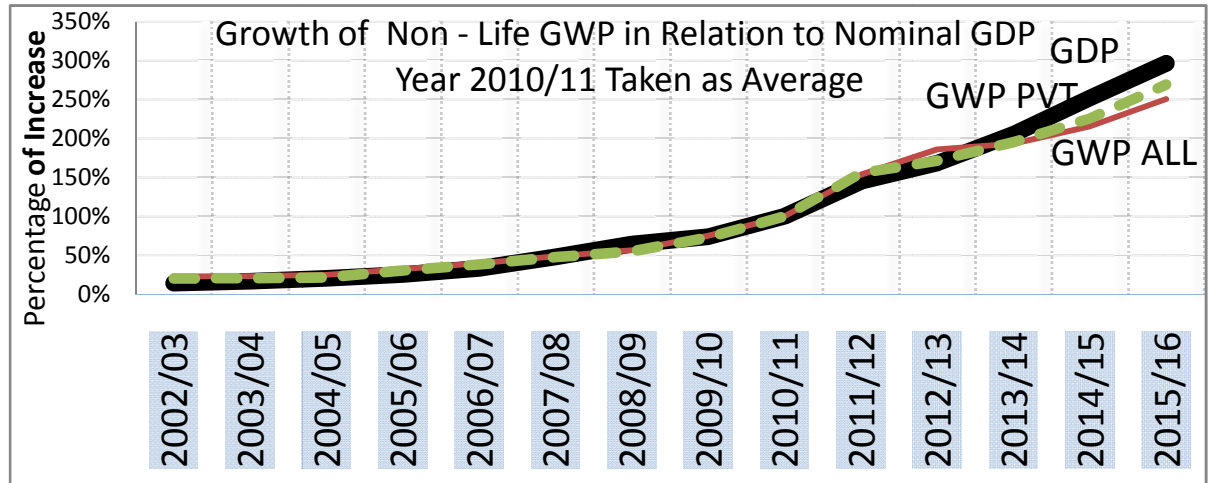
Modern insurance business in Ethiopia was started in 1905 according to various sources as stated by *Hailu Zeleke(2007)*. Referring chamber of commerce *Fikru Tsegaye(2014)*, *Demis H. Gebreal(2016)*, also expressed that there were 19 insurance companies in 1954, 33 insurance companies in 1960 and 40 insurance companies in 1967. Due to nationalization of all private insurance companies by the Derg Regime, all private insurance companies ceased operation and new public insurance company was established. The Ethiopian Insurance Company was established in 1975 which is public and major insurance company in Ethiopia. After abolishing of command economy the business was opened again to private sector. Proclamations No. 86/1994, was declared for licensing and supervision of insurance businesses. With this opportunity new insurance companies had started operation since 1994.

The role of insurance industry in Ethiopian economy is still very low although it is increasing continuously from year to year. This fact can be depicted by the contribution of Ethiopian Insurance industry to the gross domestic product (GDP) what is called penetration. Penetration is the insurance premiums in % of GDP for a given territory in a year. The penetration of non life insurance premium of Ethiopian Insurance Industry is insignificant as compared to developed countries. The penetration of non life insurance of Ethiopia is 0.4% for the year 2015/16 where as for developed country, United States of America, it was about 6.4% for the year 2014 as per Organization for Economic Co-operation and Development (OECD) Global Insurance Statistics, April 2016,

Another measurement of the contribution of insurance business to the national economy is density. Insurance density is a ratio of premium to population. The density of non life insurance in Ethiopia was 66.43 Birr for the year 2015/16. Whereas for developed country, United States of America, it was about 3,720 US dollar in the year 2015 as per OECD Global Insurance Statistics.

The growth of non life insurance and GDP can be expressed with continuous increase. This continuous increase is an expression of external factors for non life insurance premium. However the growth of GDP to the growth of non life insurance premium is higher from the year 2013/14 up to 2014/16. This indicates that the non life insurance sector did not tap sufficient premium. This gap indicates that the insurance companies need to introduce new product development and to intensify marketing strategy. Refer the figure below

Figure 1 Comparative growth of non life GWP to GDP



Source| National Bank of Ethiopia, Financial Statement of Insurance Companies, Chart illustrated by researcher

In Ethiopia currently there are 17 insurance companies of which 16 are private insurance companies and one is public insurance company. All insurance companies underwrite non life insurance business. The type of non life insurance services given in Ethiopia includes the following.

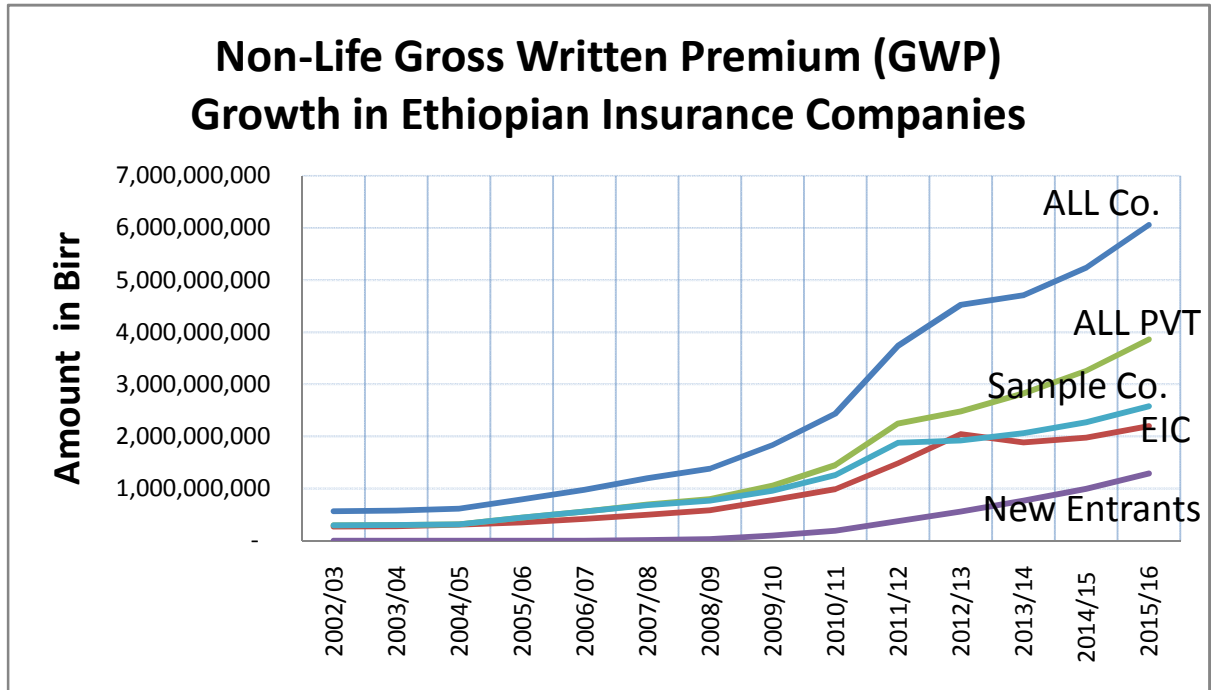
Table 1 Type of non life insurance service given by Ethiopian Insurance companies

- Fire and Allied Perils
- Burglary & House Breaking
- Consequential Loss (Business Interruption)
- Motor-Commercial Vehicle (own damage and third party)
- Motor-Private Vehicle (own damage and third party)
- Marine (Cargo and Hull)
- Goods-in-Transit
- Bonds
- Engineering
- Horticulture
- Personal/Group Personal Accident
- Fidelity Guarantee
- Money
- Plate Glass
- Product Liability
- Professional Indemnity
- Public Liability

Source| Financial Statement and web site of Insurance Companies

In addition to the above classes of business few insurance companies have recently introduced new products like crop insurance and condominium insurance as per their products are displayed on their web sites. The growth of non life insurance premium varies from public to private and from company to company. Refer the figure below.

Figure 2 Non life insurance gross written premium growth



Source| National Bank of Ethiopia, Financial Statement of Insurance Companies Chart illustrated by researcher

Currently insurance business in Ethiopia is governed by Insurance Proclamation No. 746/2002 and supervised by National Bank of Ethiopia. Insurance business in Ethiopia is not open to foreign companies. The insurance business in Ethiopia is characterized by price competition. According to *Fikru Tsegaye (2014)*, the Ethiopian insurance industry is principally characterized by the repeated cutting of prices.

1.2. Background of the Study

Gross written premiums are the amount of premiums that policy holders are required to pay for insurance policies written during the year. According to *investopedia*, direct written premium represent the growth of a company’s insurance business during a given period. According glossary of insurance & risk management terms of International Risk Management Institute (IRMI) direct written premium is the total amount of an insurer's written premiums without any allowance for premiums ceded to reinsurers. It comprises

general Insurance (non-life) and life and health (LH) insurance contracts that pay off in lump sums or annuities upon the insured's death, disability, or retirement.

Insurance industry as one of financial sector plays important role in promoting economic stability and growth. On the other hand insurance industry in turn significantly benefits from sustainable growth of economy. The growth of insurance premium has been considered as major indicator for industrial growth in the sector. Another indicator of the insurance industry is expressed by the density and penetration. These two indicators are also derived as a ratio from the amount of premium underwritten in the sector. The main purpose of this study is to identify and the influencing factors of insurance premium in Ethiopian insurance companies. Due to this fact this study focuses on the determinants of the growth of gross written premium.

There is practice of estimation of premium growth depending on the growth of real gross domestic products (GDP), *Bianchi et al (2011)*. Insurance premium is a product of renewable and new policies. Among these the growth of insurance premium is expected mainly from new policies which are the cascade of growth in the economy. According to the study of *Swiss Re (2016)* growth in global non-life insurance premiums are projected to be driven by the emerging markets. This projection was based on the study of Asia and Latin America market premium growth in the past ten years. According to their study, factor which contribute for fast premium growth are sound economic environment, improvements in insurance regulations, product innovation, and a leveraging of multiple distribution channels.

In last ten years insurance premium in Ethiopia has grown remarkably. Similarly the growth of Ethiopian economy for the same period has registered constant increase. This similarity attracts this researcher to closely look their degree of correlation and determinates of macroeconomic factors that influence the growth of insurance premium. The magnitude and the growth of insurance premiums is a concern of all insurance companies since it is the main source of their income. Sustainable growth and stability is a fundamental issue of insurance companies. In order to achieve this, all companies need to have steady growth in their insurance premium. Financial stability of insurance companies in turn is a concern of policy holders. It creates confidence in transferring their risks and to be indemnified upon possible losses. Accordingly it is possible to notice the linkage between the financial soundness of an insurance company and the choice of insurers by the policy holders. As a result it is mandatory to conduct comprehensive study the root causes of the growth of insurance premium so as to maintain sustainable growth in written premium.

Few literatures were released in Ethiopia with regard to the factors influencing the profitability of insurance companies in Ethiopia. *Daniel & Tilahun (2013)*, *Asrat & Tesfahun (2016)*, *Yuvaraj & Abate (2013)*, *Meaza (2014)*, *Mistre (2015)*, *Suhili (2015)* and few others. A number of studies have been conducted in determinants of

profitability of insurance companies including the macroeconomic variables as an independent variable for profitability. However the factors of profitability do not necessarily demonstrate the growth of insurance premium. Since the profitability mainly depends of prudent underwriting, efficient claim handling, investment return and others. A number of literatures are also available in the macroeconomic factors as determinants of the growth in insurance premium. To mention some of them: *Bunny et al(2013)*, *Porntida (2012)* , *LenkaCepel'akov'a (2015)* , *Casper Christophersen and Petr Jakubik (2015)* .The issue will be discussed in detail in literature review. Extensive study is yet to be conducted in factors influencing the magnitude and growth of premium in Ethiopia. Among many factors influencing the growth of insurance premium, this study confirms the degree of the relation of the macroeconomic and firm specific factors with the growth of the insurance premium.

1.3. Statement of the Problem

In the countries of emerging economy like Ethiopia Premium growth is expected. The growth of insurance premium at firm level is a factor of many things among them macroeconomic factors like the growth of domestic product (GDP), inflation, interest rate, awareness and income of the society to be mentioned. Similarly the role of insurance brokers, the role of related company, promotion, loyalty of customers, are among external influencing factors to be mentioned in growth of insurance premium. On the other hand financial soundness, customer service, insurance price, internal human resource capability, reinsurance arrangement, the role of sales agents and new product development, are among the internal factors of premium growth in a given firm.

According to *Feyen et al (2011)* there is evidence of a causal relationship between insurance sector development and economic growth. The non-life sector is affected by macroeconomic factors and other variables.

Li, et al (2003) indicate that foreign direct investment in insurance services (FDI) is a significant contributor to the volume of insurance services. *Beenstock, et al (1988)* conducted cross section analysis on 1970 to 1981 data, covering mainly 12 countries. They analyzed premiums for property liability insurance on Gross National Product (GNP), income and interest rate development. They found those premiums are correlated to interest rate and GNP.

Under normal circumstances the growth of insurance premium should be the factor of two major things: internal factors and external factors. Among the external factors the lion share goes to the growth of macroeconomic factors. Economical activities in economic growth are a source of business for insurance industry which is cake that is going to be shared among insurance companies. Among the internal factors the image of the company and the rate (price) applied on a group of insurance exposure seems to be the most influential. In this study the researcher would confirm which of the internal factors to be the most influential.

The image of a firm is mainly expressed by the financial soundness or financial strength and stability. Reliability is the major factor in the process of acquiring a guarantee since insurance is business of trust and reputation. According to *William C. Spaulding (2017)*, rate is the price of insurance per exposure unit. Based on this scenario the researcher has taken the loss ratio which is a demonstration of rate applied by insurance companies for a given period of time. Accordingly, loss ratio is taken as internal factors to fill the gap of insurance price as a firm specific factor. According to *John Captain (2012)* to maintain consistent degree of premium, the loss ratio has to change accordingly that is earned premium to change with exposure and loss trend. Among the firm specific factors we evaluate how increase in premium growth behaves with loss ratio.

The increase in premium and profitability of insurance companies in Ethiopia has attracted new entrants to the industry. In the last ten years eight companies had joined the industry. To confront this competition and expand their coverage the existing companies had also increased their number of branches. This study evaluated the accessibility as influencing factor for growth of insurance premium. This study focuses only on evaluation and measuring of macroeconomic and firm specific factors as a factor of premium growth. Other factors which are relevant to a factor of premium growth are not included in this study due to their nature and scope.

More importantly insurers have to closely watch both the external and internal determinants of premium growth. Degree of sensitivity of each determinant variable has to be studied at different economic situation. Sustainability in insurance business is crucial factor in insurance business. Steadily premium income must be assured to gain sustainability.

As a result continuous study of factors of insurance premium growth in different situation is mandatory and a concern of insurance business stakeholders as a whole and for insurance companies in particular. This paper has its own contribution in evaluation and confirming of sensitivity of the selected determinants of the variables. It is helpful for policy makers, regulatory body, and other stakeholders' in particular insurance firms in order to grow their production from the understanding of the sensitivity of macroeconomic situation and firm specific factors under Ethiopian context.

1.4. Objective of the Study

a. General Objective

The main objective of the study is confirmation and evaluation of factors that determine the growth of insurance premium of insurance companies in Ethiopia.

b. Specific Objectives

◆ To review major factors of the macroeconomic factors that is gross domestic product, foreign direct investment and inflation and firm specific factors that is solvency,

loss ratio, investment return, number of branches dependency on intermediaries that determines the growth of non life insurance premium of insurance companies in Ethiopia.

◆ To evaluate the degree of sensitivity of the macroeconomic factors that is gross domestic product, foreign direct investment and inflation and firm specific factors that is solvency, loss ratio, investment return, number of branches dependency on intermediaries that determines the growth of non life insurance premium of insurance companies in Ethiopia.

1.5. Research Hypothesis

In the countries of emerging economy like Ethiopia premium growth is expected mainly from economic growth. And this growth is mainly expressed in macroeconomic factors. Accordingly the researcher has taken macroeconomic factors as determinant factors of premium growth. On the other hand Insurance is a business of trust and reputation. And this quality is expressed mainly from the image and financial strength of the company. Accordingly the researcher has taken firm specific factors as determinant factors of premium growth

The variables to be studied are listed below.

Table 2 Dependent and Independent Variables

| Independent Variables | Dependant variable |
|-------------------------------------|-----------------------|
| | Gross Written Premium |
| <u>Macroeconomic factors</u> | |
| Gross Domestic Product(GDP) | |
| Foreign direct Investment(FDI) | |
| Inflation | |
| <u>Firm specific factors</u> | |
| Solvency margin | |
| Number of branches | |
| Claim Ratio | |
| Investment Return | |
| Dependency on Intermediaries | |

Accordingly the following 8 hypotheses were developed based on 8 independent variables as follows.

H1: The growth of gross domestic product (GDP) has significant impact on growth of non life insurance premium of private insurance companies in Ethiopia.

H2: The growth of foreign direct investment (FDI) has significant impact on growth of non life insurance premium of private insurance companies in Ethiopia.

H3: The growth of inflation (INF) has significant impact on growth of non life insurance premium of private insurance companies in Ethiopia.

H4: The growth of solvency margin (SLM) has significant impact on growth of non life insurance premium of private insurance companies in Ethiopia.

H5: The growth of loss ratio (LOR) has significant impact on growth of non life insurance premium of private insurance companies in Ethiopia.

H6: The growth of number of branches (NBR) has significant impact on growth of non life insurance premium of private insurance companies in Ethiopia.

H7: The growth of investment return (INR) has significant impact on growth of non life insurance premium of private insurance companies in Ethiopia.

H8: The growth of dependency on intermediaries (DOI) has significant impact on growth of non life insurance premium of private insurance companies in Ethiopia.

1.6. Scope of the Study

The scope of the study is limited to the selected variables and their impact on insurance premium growth in selected private insurance companies in Ethiopia. These variables are consists of selected external and internal influencing factors. It is to be noted that some factors which are influencing to premium growth like customer service are not included in this study due to their qualitative nature. The study is limited to the year 2002/03 to 2015/2016 financial years. Among sixteen private companies in Ethiopia eight companies are not included in the study because of their year of establishment do not fall in the selected years. According to the recent year report that is for the year 2015/16 the selected private companies' gross written premium constitutes 67% percentage of the total gross written premium of private insurance companies in Ethiopia.

1.7. Significance of the Study

Gross written premium is a core business and a top line in revenue account of insurers. It is also a top concern of insurers, shareholders, regulatory bodies, policy makers, and other stakeholders. The researcher believes that as many studies were not conducted on the determinants of non life insurance premium in Ethiopia, this study have its own contribution for future reference in the field of the same study. It has been considered as indicator of the growth of insurers and the sector as a whole. The growth of insurance premium varies from firm to firm from country to country and from year to year. There are studies in this matter

across the globe. However, to the best of the researcher's knowledge the factors of the growth of insurance premium were not adequately studied locally at least from different perspective.

Most of the studies conducted in Ethiopia have been focusing on profitability of insurance companies in Ethiopia. Among these researchers, *Daniel, and Tilahun,(2013), Asrat and Tesfahun (2016), Yuvaraj and Abate (2013), Suheyli (2015),Mistere (2015), Hana Mariam (2015), Behailu(2016), Meaza(2015), and Hadush, (2015)* can be mentioned. A number of studies have been conducted overseas on the growth of insurance premium. However, many studies to be done locally in this matter. This study has its own contribution to fill the gap in Ethiopian context. Insurers have to consider all the relevant factors in setting their strategies to boost their business. Policy makers, regulatory body, insurance companies and other stakeholders want to have understanding of the degree of influencing factors in different economic situation. Based on empirical evidence it is important to know what statistical analysis would tell us about the correlation of relevant variables. This study would reveal correlation of macroeconomic and firm specific factors that influence the growth of insurance premium growth in Ethiopia.

1.8. Limitations, and Assumptions

Limited researches have been conducted locally in the subject matter to refer with regard to the same subject matter. The researcher tried to refer most of the empirical evidences and literatures studied overseas. However the researcher faced many problems in finding resources in statistically analyzed research results especially in area of firm specific factors. In order to close the gap of literatures, the researcher mainly used empirical findings, assessment reports and business reviews conducted by insurance associations and economic research and consulting firms. On the other hand the availability of quantitative panel data of variables helps researcher to evaluate objectively the selected determinant variables.

Without inclusion of insurance price, it would be difficult to have complete determinants of premium. However the researcher took loss ratio as a reflection of price of insurance since loss ratio is the ratio of net premium to its associated claim incurred. It is to be noted that however the loss ratio has its limitation in exclusion of reinsurance premium and inclusion of catastrophic risk. In order to measure dependency on intermediary the researcher took sales commission paid to intermediaries. It is based on the assumption that each insurer pays the same rate of sales commission. On the other hand the portfolio mix of type of non life insurance again assumed to be similar in all insurance companies as the rate of commission varies depending on the type of insurance. Determinants macroeconomic factors and some of firm specific factors like loss ratio and solvency were selected as per previous studies on empirical evidences on performance of insurance companies studied locally and overseas. Firm specific determinants like number of branches and dependency on intermediaries are

included in the study because of the nature of the business and literatures available in overseas studies.

The study focuses only on selected private insurance companies. One governmental insurance company which constitutes 40% of the insurance premium in Ethiopia was not included in the study because of the nature of its firm specific influencing factors. For example dependency on intermediaries of Ethiopian Insurance Company is far from private insurance companies. By the nature of its size and structure this exclusion was necessary in order to not distort result of variables.

This study covers 14 years of panel data of 8 private insurance companies which are be 112 observations. This is because the maximum observation that researcher can gate with maximization of number of companies and number of years. It is to be noted that because of different date of establishment of insurance companies one cannot take both maximum number of years and maximum number of companies simultaneously. One of the limitation of these study is it confirms the relation of variables in total sum not by each type of non life insurance which is beyond the scope of the study. In order to have closer look of sensitivity of variables it is very important to study each type of non life insurance with its relevant independent variable.

1.9. Organization of the paper

This study paper was organized in to five chapters. Chapter one covered introduction where overview of the non life insurance in Ethiopia, background of the study, statement of the problem, research hypothesis, objective of the study, scope of the study, significance of the study, limitations, and assumptions. In chapter literature review, empirical evidence and conceptual frame work were discussed. Chapter three dealt with research methodology. In chapter four results, findings and discussion were expressed. Finally, Chapter five, the final chapter, covered the conclusion and the recommendation.

CHAPTER TWO

2. Literature Review

2.1. Theoretical Review: - Gross Written Premium

One of the core businesses of insurance companies is underwriting; Insurance Regulatory Authority (*IRA*), (2013). It is expressed in a written contract called policy. Insurers entered into obligation to cover the value of futures losses not exceeding the sum insured specified under contract. One of the seven basic principles of insurance to apply here is the principle of “*utmost good faith*”; *Gaurav Akrani(2011)*. Both parties of the contract insurer and insured are required by law must observe utmost good faith. It must be utmost good faith because good faith is not enough. The Insured has better knowledge of the property to be insured. And as insurance is intangible product is a promise and it should not be false promise. All party is required to tell the truth of material fact. Fail to disclose information even if not disclosed allow the victimized party to regard the contract as void.

On the other hand insured must be free of moral hazard to claim the outcome of genuine claim incident. Insurers decline claims due to false occurrences and losses beyond the value of incidental loss since it is a violation or exclusion of terms and condition of insurance contract. The principle of insurance that apply here is the principle of “*Indemnity*”. According to *Rob Thoyts (2010)*, indemnity is defined as financial compensation necessary to ensure that the policy holder’s financial position after the loss is the same as their financial position immediately before the loss.

Premium is the price of transferring risk that the insurance companies charge for their service; Insurance Information Institute (III) glossary. Companies, individuals, governmental organizations and nongovernmental organizations are the buyers of insurance policies. Insurers and policy holders would enter into a contract that would be issued for policy holders in exchange for the premium to be paid by the insured. Gross written premium is gross because it is premium before deducting the reinsurance premium to be ceded to reinsurers. Reinsurance premium is a premium to be paid to insurers of insurers which are called reinsurers.

Insurance companies charge equitable premium rate set for each class of business that is sufficient to transfer the risk. Depending on the assessment of risk and risk selection they may charge add-ons or may give discounts. In some circumstances they may use flat rates. To set equitable premium it is very important to look into the hazard analysis to determine the probable frequency and severity of loss for each insured property and liability.

Calculation of equitable premium is critical task of insurance professionals; *Rob Thoyts (2010)*. Each class of business has to be analyzed in its homogeneity of type of risk and

expected volume of sales. As explained by *William C. Spaulding (2017)* insurance price is based on predictions. The actual losses and expenses are not known when the premium is collected. In prediction of insurance price however, the difficulty arises in the case of catastrophic losses in the historical statistical analysis. The accuracy of prediction of future losses as well as determination of expected the volume of risk pool is crucial task of insurers in charging sufficient price or amount to cover the loss that is premium.

Insurance premium considering its influencing factors has to be predictable. Stability in insurance business is a serious matter. Insurance companies are managers of risks transferred to them from policyholders. Prediction of premium and risks associated with it enables insurers to set commensurate premium and earn stable profit. In this study most of the quantitative determinants of insurance premium growth is discussed and analyzed.

2.2. Empirical Evidence: - Macroeconomic Factors that Influence the Growth of Insurance Premium

2.2.1. Foreign Direct Investment

It is an investment made by a company or individual in to another country. FDI has significant positive effect in a given economy. For a country like Ethiopia characterized by emerging economy foreign direct investment has significant effect as a source of insurance business. It is an injection to the economy as a whole and for insurance premium. Especially for the insurance companies it is a source of marine, goods in transit, engineering, motor and other property and causality insurance from incoming companies and individuals. On the other hand it increases the employment opportunities whereby the income of the population increases which boosts the demand for insurance at individual level.

The favorable economic policy in Ethiopia has attracted foreign direct investment at lease for the last ten years. Accordingly the country has registered constant economic growth. The same constant growth of gross written premium was registered among insurance companies businesses. Since financial business is not liberalized in Ethiopia, the premium expected from FDI is to be shared among the existing insurance companies in Ethiopia. In this study the researcher validated the contribution or the significance of foreign direct investment in growth of written premium.

Cuizhen Zhang and Nong Zhu (2010), in their study on determinates of insurance premium found out that Foreign Direct Investment (FDI) has positive and significant effect on insurance premium which confirmed the previous study conclusion of *Ma and Pope (2003)*, on same variables. *Li, Moshirian, and Sim (2003)* indicated that foreign direct investment in insurance services (FDI) is a significant effect on volume of insurance services.

2.2.2. Gross Domestic Product(GDP)

It is a monetary measurement of goods and services produced in a country for a specific period of time. It is an indicator of economic growth of given country. One of the sources of the growth of GDP is the increase in insurance premium and vice versa. However the contribution of insurance premium to the national economy is not significant. In order to contribute its expected share to the national economy the insurance premium has to grow faster than the GDP. Constant increase both in GDP and insurance premium is expected in Ethiopia since the economy is characterized by emerging economy. In this study the searcher proved the trend of both variables for the period under study.

In order to increase insurance premium new source of business has major effect. And an increase in GDP is a potential new source of insurance business.

Casper Christophersen and Petr Jakubik, (2014), in their empirical studies revealed that there is strong link between Gross written premium and economic growth. *Haiss Æ KjellSu`megi (2015)*, investigated there is parallel and rapid growth of total insurance and of total assets relative to GDP growth. *Pradhana, et al (2014)* demonstrated that there is a long-run equilibrium relationship between financial sector development and economic growth

According to *Beenstock, et al (1988)*, on property liability insurance premiums, and per capita GNP, increase in insurance spending differs from country to country and premiums vary directly with the real rates of interest and wealth status of the consumer was significant factor for consumption of property liability insurance. *JF Outreville (1990)*, investigated empirically the relationship between property liability insurance and economic growth and confirmed wealth status of the consumer was significant factor for consumption of property liability insurance.

2.2.3. Inflation

Inflation is the growth rate of consumer price index for each country. As discussed above premium is a price that is going to be charged to cover of expected loss. Although different rate is applied for different class of business, in almost all cases the rate is computed based on the sum insured. Sum insured is the maximum amount that is to be paid to insured property or liability when loss occurred. In the period of inflation the cost of recovering the loss increases from time to time. And the value of products and services tends to increase from time due to inflation. In other words the sum insured increases from time to time. Accordingly it is logical that the premium to be charged increases during the time of inflation.

As far inflation has an effect on sum insured, it is very important to understand the degree of influence of inflation on insurance premium. Insurers has to be conscious the effect inflation in order to plan the expected gross written premium. To have adequate estimation of

expected loss management expenses and the like insurers have to adequate knowledge of the trend of inflation. This study investigates and evaluates the degree of influence of inflation on insurance premium.

According to *Customwritingservice.org (2016)* during high inflationary period customers threatened by losing the value of property may rush to insurance services and will impact on increase insurance premium. An empirical study conducted by the World Bank confirms inflation seems to promote larger non-life premiums (*Lester, 2002*). Similarly, study by *Mihail Petkovski and Kjosevski Jordan (2014)* revealed the same result. According to the empirical study by *Heni Bouker and Nadia Sghaier (2012)* during the inflationary periods, the effects of inflation rate on the non-life insurance premiums are negative.

2.3. Empirical Evidence: - Firm Specific Determinants

2.3.1. Financial Soundness: Solvency

According to *Financial Sector Assessment a Handbook (2005)*, financial soundness indicators (FSI) are indicators of financial stability of the financial institution.

It is a concern of regulatory bodies, large corporate customers and insurance brokers. In order to transfer their risk to reliable insurer, they usually have a look at on the financial soundness of respective insurance company.

As per consumer guide to home insurance by National Association of Insurance commissioners (NICE) (2010), customers' choice in selecting insurers may depend on financial soundness and suggests looking at rating of insurers by rating companies. However this is not practiced in Ethiopia because of the absence of rating companies or it is not mandatory. And hence the researcher tries to analyze the most influential variable from the financial soundness of CARMEL model.

For insurance companies financial soundness is evaluated according to *CARMELS model* (Capital adequacy, Asset quality, Reinsurance, Adequacy of claims and actuarial, Management soundness, Earnings and profitability, Liquidity and Sensitivity to market risk)

It is assumed that all of insurance companies are financially sound since they are under supervisory body that is National Bank of Ethiopia. However if the premium to be charged by insurers is equivalent, the financial soundness would be the competitive advantage to win the offer by large corporate customers.

CARMELS model helps stakeholders to evaluate the financial healthiness and strength of the insurer. Among the FSI, the researcher selected the most influential variable, solvency, to evaluate capital adequacy (solvency) in relation to gross written premium of each insurance company. Solvency is the ability of insurer to settle claims. It is the excess of asset over liability that is a shield for unforeseen circumstances that may occur at time loss incidence. It

is another expression of leverage which is the ratio of debt to equity. Measurement of solvency margin is expressed by the excess of admitted asset over admitted liability. Admitted asset is net balance of total asset after deducting some category of assets to be excluded as per regulatory requirement. A minimum percentage is set by regulatory body for solvency margin to keep healthiness and strong enough to be solvent. This solvency margin must be higher than the required percentage of net premiums written or percentage of technical provisions. Rapid premium growth of insurance premium on the other hand exposes a company for accumulation of high risk. And this accumulation will lead to insolvency: *Janotta-Simons, F(1999), Leflaive, V(2002), Kim et al.(1995)*

Stress situation in this matter is the concern of both insurers, insured and regulatory body. Insurers in the stressful situation of solvency margin have to charge higher premium and this in turn has an influence on premium growth. This in turn limits the level of gross written premium.

According to *investopedia* Solvency ratio, with regard to an insurance company, means the size of its capital relative to the premiums written, and measures the risk an insurer faces of claims it cannot cover. According to *Sanjay Datta (2017)* new entrant insurers need to balance growth with profitability and solvency margins. According to the recommendation of *Fitch (2014)* Insurers with thin capital resources might retreat from those business lines with high capital risk charges and weak underwriting results. Another indicator of solvency is loss ratio according to *BarNiv and McDonald (1992)*. Continued increase in loss ratio will lead to insolvencies. *Peter M. Ellis (1998)*.

In this study the researcher tests the sensitivity of solvency margin in the growth of insurance premium. This is because solvency is driver of insurance premium growth and a concern of stakeholders that influences the main purpose of the insurer.

2.3.2. Loss Ratio

Loss ratio is the amount of loss to be paid for corresponding premium earned by insurers for a given period of time; Insurance Information Institute (III) glossary. Loss ratio it is very important in measuring the financial strength of an insurer and it easily indicates the balance between premiums and losses. *BarNiv and McDonald (1992)* concluded loss ratio is an important determinant of solvency. Continued increase in loss ratio will lead to insolvencies; *Peter M. Ellis (1998)*.

Loss ratio can be measured for a company and for the industry as a whole. However more realistic loss ratio is depicted when it is measured for specific class of business. But the scope of this study is to measure the behavior of the premium charged in relation to the aggregate loss ratio at company level. One of the limitations of the loss ratio is that it might be influenced by catastrophic loss. However it is a practice of insurers to transfer such type of risks which are beyond their capacity limit. In calculating loss ratio of insurers, the

reinsurers' share of premium and loss is deducted. However insurers would be exposed to the extent of the loss for the retained premium by themselves.

A rate is the price per unit of insurance for each exposure unit; *William C. Spaulding (2017)*. Exposure unit used depends on the type of insurance by which its homogeneity is reflected in to frequency of loss occurrence and severity. Rate making is also called insurance pricing. One of the rate making methods in insurance business is the loss ratio method; *Society of Actuaries (Arch2014.1)*. Under this method the actual loss ratio is compared with the expected loss ratio, and the rate is adjusted accordingly. By applying loss change factor, the rate is determined for intended purpose. And rate in turn has an effect on premium growth.

Various studies have been conducted in the relation of premium growth and loss ratio. As per the *Record of Society of actuaries (1980)*, an unexpected increase in production may also indicate an underpriced product which will quickly become apparent in loss ratio analysis. According to *Barth and Eckles (2009)* an empirical investigation revealed that there is negative relationship between premium growth and changes in loss ratios. Too good loss ratio is an indication of high insurance price; *Chris Burand (2013)*. According to *Carl Niedbala (2016)* Losses and claims can have a major effect on your insurance premiums.

Competitive pricing exposes the insurance business for losses unless otherwise adequate premium is charged. According to the study of motor insurance in Indonesia conducted by *Ernst & Young (2011)*, many insurers which are volume-focused and competitive pricing have been suffering losses after charging inadequate premiums. Cutting of insurance prices will speed up subsequent periods of rapid premium growth, *Harrington, Danzon, and Epstein (2008)*. However, Wrong forecast of loss ratio will end up with wrong rating and will result unexpected result. *Harrington and Danzon (1994)* also found out cross-sectional analysis of insurer loss forecast revisions and premium growth that provides evidence that is consistent with low pricing which implies loss distribution produced large industry-wide forecast error.

Choi and Weiss (2005) examined property-liability insurers over the period 1992-1998 and found that cost-efficient firms charge lower prices than competitors, which enabled them to capture larger market share. However prices and profits were found to be higher on revenue efficient firms. *Weiss and Choi (2008)* has compared rate regulated states and non regulated states and found that insurers in rate regulated states able to get less revenue than insurers in competitive states. Empirical study conducted by *Peter M. Ellis (1998)* in United States for 55 years in property and casualty insurance revealed that the industry net premium volume and aggregate losses are quite similar.

2.3.3. Dependency on Intermediaries

Insurers usually acquire business through intermediaries or direct from customers. The role of intermediaries' is to say the role of sales agents and insurance brokers. It is depicted by the sales commission. Sales commission is a commission paid to sales agents and insurance brokers for their service in the process of acquiring of insurance premium and assisting claim handling to customers. Insurance agents are licensed individuals to promote business by the side of insurance companies. They exclusively work for a single company. Whereas insurance brokers work for the policyholders supposed to act independently in relation to insurers. Insurers in Ethiopia have to pay a commission for brokers for the business they acquire through insurance broker. Business acquired from sales agents and brokers vary from time to time. This is because mainly the insurance companies have an option to underwrite directly to the insured. The commission is paid usually as percentage of the premium underwritten. And the percentages vary by the type of insurance business acquired. The dependency of agent's contribution as a total of premium underwritten varies from company to company.

Insurers acquiring business by contacting directly customers will save the cost of business canvassing and sales commission. On the other hand by incurring the cost of auxiliaries' commission would have the impact of boosting the insurers' premium. Although the dependency varies, insurance companies are dependent on the intermediaries to increase their premium. It is assumed that agents and insurance brokers influential to canvass and persuade customers to acquire business. According to *Insurance Europe (2015)*, the distribution of non-life policies in Europe is mainly carried out through intermediaries (agents and, to a lesser extent, brokers) and direct writing by employees and distance-selling. According to *Insurance Brokers Association of India (IBAI) (2016)*, the increase from year 2010 (53%) to 2014 (70%) in motor and health was achieved channel due to major contribution in overall non-life insurance premium though broking channel. In America, based on the report of *Independent Insurance Agents and Brokers of America (2016)*, 35% of personal line premium and 80% of commercial insurance sales were undertaken bay insurance agents. Therefore cost incurred as a commission is assumed to have significant effect on premium growth. Accordingly, the researcher has introduced cost of auxiliaries (agents and brokers) as a variable to determinant of the growth of insurance premium. There is a gap of study in to investigate the premium growth with corresponding increase in sales commission. In this study the researcher evaluate the degree of influence of the sales commission on the growth of insurance premium.

2.3.4. Investment Return

Insurance premium charged from customers must be sufficient to cover future losses that insurance companies are facing. In the absence of investment return the premium to be charged must cover all insurance claims, reinsurance costs, handling costs, sales commission,

administrative costs and profit to be paid to share holders. In the absence of adequate investment return, and in order to be profitable, insurance companies are forced to charge higher premium or be stressed in risk selection. Had it been no investment return the profitability of some insurance companies may be questionable. In order to continue the business profitable insurance companies have to charge sufficient premium. On the other hand higher premium rate has adverse effect on premium growth. To mitigate business risk and to charge competitive premium and increase their profit, insurance companies are investing in optimum investment portfolio. The level and consistency of yield in investment helps as hedging for underwritings risk. The investment return supports and makes comfortable the profitability of insurers. Insurance companies with high investment return have the power to reduce premium rates so as to boost premium growth. *Andreas Kull (2002)* explained, Pricing of contracts and assessing reserves depends directly on the anticipated investment return. Assuming the competitive advantage of investment return the price of the premium can be adjusted to influence premium growth. According to the study of *Confederation of Insurance Industry (CII) and Ernst & Young, (2012)*, insurers have been operating at extremely low prices, with certain players invariably depending on investment income to offset operational losses, thus increasing loss ratios. As a result we can assume that insurers with better investment return can perform with low price which will lead to high premium growth.

2.3.5. Number of Branches

Increase in premium can be achieved through exploring new market by way of opening of new branches in new territory. This is because accessibility is the most significant factor for insurance business whereby customers get services in nearby offices. Opening new branches may be very costly in terms of labor and office rent. However business canvassing due to increase in urbanization pulls insurance companies to open new branches in potential areas.

Lietivos Bankas (2015) demonstrated large volumes of the insurance market were due to growth in insurance branches. According to *McKinsey's Global Insurance Industry Insights* insurers must concentrate their resources to increase their market share on the segments and regions that offer the most potential for high growth, such as big cities in emerging markets. As per *Swiss Re (2015)* global insurance review the growth of insurance sector in Philippine is attributed to establishment of new branches. In this study the researcher investigated the sensitivity of the number of branches in premium growth.

2.4. Summary of Literature Review and Knowledge Gap

All of the above studies indicate that the higher the GDP, FDI, and inflation is the higher for insurance premium and the increase in demand for the safeguarding of the property acquired. Foreign Direct Investment has positive and significant effect on insurance premium was

studied and proved by, Zhang et al (2010), Ma and Pope (2003), and Li, et al (2003). Gross domestic product has significant influence of the gross written premium was studied and verified by Christophersen et al , (2014), Kjell et al (2015), Pradhana,et al (2014), Beenstock, et al (1988) . Inflation promote larger non-life premiums was studied by (Lester, 2002), Petkovski et al (2014), Bouker et al (2012).

All of firm specific factors: Solvency margins, claim ratio, number of branches, dependency on intermediaries and investment return have positive effect on insurance premium growth. Treat of insolvency refrain the growth of insurance premium was discussed by Janotta-Simons, F(1999), Leflaive, V(2002), Kim et al.(1995), , Fitch (2014), Loss ratio as reflection of insurance price and influencing factor of premium was examined by Record of Society of actuaries (1980), Barth and Eckles (2009), Chris Burand(2013) , Carl Niedbala (2016) , Harrington et al(2008) , Ellis (1998). Intermediaries as influential to canvass business were assessed and reported by Insurance Key Facts (2015), Insurance Brokers Association of India -Vision 2025, Independent Insurance Agents and Brokers of America (2016). Pricing of contracts depends on the anticipated investment return or dependency on investment income was examined by Andreas Kull (2002), Confederation of Insurance Industry (CII) and Ernst &Young, (2012). Large insurance market were due to growth in insurance branches was assessed and reported by Lietivos Bankas (2015), Swiss Re (2015) and , McKinsey's Global Insurance Industry Insights(2015).

Many studies conducted in the growth of insurance premium overseas have been focusing on macroeconomic determinants. On the other hand the profitability of insurance companies was studied globally and locally both from view point of macroeconomic and firm specific factors. However statistical analysis of firm specific factors as determinant of gross written premium of non life insurance was not adequately studied. In this study the researcher tried to confirm both macroeconomic and firm specific factors using statistical analysis from the view point of growth of gross written premium.

CHAPTER THREE

3. Research Design and Methodology

In this chapter research design, population, sampling technique, data source and method of collection and model specification, variables and their measurements and the methodology used for analysis are discussed.

3.1. Research design

It is a road map of the research discussed in this section. The study is casual research designed to conduct quantitative research analysis. The study is to evaluate determinants of insurance premium their degree of significance and how they are correlated. The data necessary for the quantitative research are determined based on the variables to be analyzed. The population and sample is determined followed by data collection. Model specification and conceptual framework is developed that would help for analysis.

3.2. Population

The population is the total of the collection of all elements having similar characteristic; *Cooper and Schindler (2001)*. The population of the study is non life insurance premium of all private insurance companies in Ethiopia. Among the all insurance companies the non life insurance premium is selected for study as discussed on the objective of the study. Accordingly the population of the study is the non life insurance premium of 16 private companies in Ethiopia for the period of 1994/95 to 2015/16.

3.3. Sample design

Among 16 insurance companies in Ethiopia, 8 private insurance companies are selected. As discussed in the scope of the study the selected insurance companies are Awash Insurance Company S.C, Africa Insurance Company S.C, National Insurance Companies of Ethiopia (NICE) S.C., Nyala Insurance Company S.C., Nile Insurance Company S.C., The United Insurance Company S.C., Global Insurance Company S.C., NIB Insurance Company S.C. these companies are selected purposely because of their age. In order to have a long time series, recently established companies has to be excluded from the study. Accordingly the period of study is 14 years that is non life insurance premium for the year 2012/3 to 2015/16.

Figure 3 The Population and sample of Insurance companies with sample period

| sn | Insurance Companies in Ethiopia | Date of Establish. | Years of Operation | | | | | | | | | | | | | | | | | | | | | | |
|----|----------------------------------|--------------------|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| 1 | Ethiopian Insurance Corporation | 1975 | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Awash Insurance Comp. S.C | 1/10/1994 | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Africa Insurance Comp. S.C | 1/12/1994 | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | National Ins. Comp. of Eth. S.C. | 23/09/1994 | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Nyala Insurance Comp. S.C | 6/1/1995 | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Nile Insurance Comp. S.C | 11/4/1995 | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | The United Insurance S.C | 1/4/1997 | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Global Insurance Comp. S.C. | 11/1/1997 | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | NIB Insurance Comp. | 1/5/2002 | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Lion Insurance Comp. S.C | 1/7/2007 | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Ethio-Life and General Ins. S.C. | 23/10/2008 | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Oromia Insurance Comp. S.C. | 26/01/2009 | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Abay Insurance Comp. | 26/07/2010 | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Berhan Insurance S.C. | 24/05/2011 | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Tsehay Insurance S.C. | 28/03/2012 | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Lucy Insurance S.C. | 1/10/2012 | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Bunna Insurance S.C. | 21/05/2013 | | | | | | | | | | | | | | | | | | | | | | | |

Research data collected and studied
 years of operation

Source| National Bank of Ethiopia, figure by researcher

3.4. The data, data source and method of data collection

The data is a secondary data required for quantitative research. The data collected is panel data which have the dimensions of both time series and cross-sections. The panel data covers all dependent and independent variables. The independent variable is non life insurance premium. And the independent variables are GDP, annual inflation, foreign direct investment (FDI), solvency margin, claim ratio, investment return, number of branches, and dependency on intermediaries.

The data is canvassed form potential sources. Accordingly National Bank of Ethiopia, Ministry of Finance and Economic Development as reference in website of National Bank of Ethiopia, Central Statistical Agency as referenced in website of National Bank of Ethiopia, financial statement of insurance companies are used as a data source. Panel data is constructed consisting matrix of time series with selected 8 companies.

3.5. Variables and their measurements

Based on literature review and empirical studies the researcher had identified relevant influential factors to be included in the quantitative research. This identification may not be exhaustive. However the researcher suggests at this point that further indicators may be explored and discussed in the future. It is also to be noted that this study is only focused on quantitative analysis.

3.5.1. Solvency margin

According to Insurance Information Institute (III) glossary, solvency is Insurance companies' ability to pay the claims of policyholders. And the solvency margin is measured as the amount by which the assets of the insurance company, at fair values, are considered to exceed its liabilities and other comparable commitments; *finanssivalvonta*, definitions of the financial ratios. Thus the excess of total asset over liabilities of selected insurance companies is taken as solvency margin. Accordingly the ratio of the increase in solvency margin is taken for analysis. It is the image of the company and would raise competitive advantage of company. Thus it has positive impact on gross written premium.

3.5.2. Loss ratio

According to glossary of insurance terms of National Association of Insurance Commissioners (NAIC), loss ratio is the percentage of incurred losses to earned premiums. It is an expression of price charged in relation to loss absorbed by each company. It is assumed that lower loss ratio means high premium rate is charged and it would impact to decrease potential customers which ultimately decrease premium. Losses and claims can have a major effect on your insurance premiums, *Carl Niedbala (2016)*. When loss ratios are too good, it may mean rates are too high resulting in too little growth *Chris Burand(2013)*. *Barth and Eckles (2009)* an empirical investigation revealed that there is negative relationship between premium growth and changes in loss ratios. But in this study the researcher investigates the amount of premium in relation to loss ratio hence loss ratio is positively correlated to premium growth.

3.5.3. Investment return

In the course of business insurance companies mobilizes huge amount money that would enable them to invest. On the other hand the investment return supports the profitability of insurers. With this pulling factor and competitive advantage, insurers with high return have the possibility of decreasing premium. Empirical studies also support this practice. The financials statement of insurance companies demonstrated the investment return. These are dividend income, interest income and rent income. Thus the researcher has compiled this result to evaluate investment return.

The study of *Confederation of Insurance Industry (CII) and Ernst & Young, (2012)*, revealed that insurers have been operating at extremely low prices, with certain players invariably

depending on investment income. High investment return creates the opportunity of decreasing premium rate to increase premium. Thus investment returns has positive impact on insurance premium.

3.5.4. Dependency on intermediaries

It is to say the sales force both internal and external. Agents are licensed agents who work with solely for a particular company. Whereas insurance brokers are external sales force and they are independent of insurance companies. They are one of the factors for insurance premium growth. On the other hand insurance companies perform their business with direct contact of customers. Although intermediaries have a positive impact of insurance premium, it has to be study how significant it is. Sales commission is paid as percentage of insurance premium acquired through these sales forces. The researcher took cost of sales commission paid to intermediaries as a demonstration of dependency of intermediaries since it is a reflection their contribution. According to *Insurance Europe (2015)*, the distribution of non-life policies in Europe is mainly carried out through intermediaries (agents and, to a lesser extent, brokers) and direct writing by employees and distance-selling.

3.5.5. Number of branches

One of the influential factors of insurance business is customer services. Serving a customer to its nearby office is very important and a sign of good customer service. It is known that customer service has qualitative nature. Since this study is quantitative research, the quantitative nature of customer service is incorporated in this study. The number of branches has a positive impact on increasing premium. However it does not assure this if the rivals also has an office in next door. In this study the researcher examine the degree of the significance of number of branches in insurance premium. According to the review of *Lietivos Bankas (2015)* and *Swiss Re (2015)* large volumes of the insurance market were due to growth in insurance branches.

3.5.6. Gross Domestic Product (GDP)

Gross domestic product is a monetary expression of goods and services produced in a country for a specific period of time. The economic growth of given country has significant impact on insurance premium. The increase in GDP is additional potential source of market for insurance companies and increase in insurance premium. *Bunny et al (2013)* took GDP as explanatory variable for insurance premium and found positive relationship. Accordingly, the researcher took the GDP of the sample period as variable to explain the determinant of non life insurance premium.

According to the empirical study by *Heni Bouker and Nadia Sghaier(2012)* during the inflationary periods, the effects of inflation rate on the non-life insurance premiums are negative. The researcher assumed that the impact of interest rate on premium could be both positive and negative. The variable taken as interest rate is extracted from average lending annual interest rate as described in the National Bank of Ethiopia website.

3.5.7. Foreign direct investment (FDI)

In emerging economy foreign direct investment (FDI) has significant effect on overall economic growth and on source of insurance business. Especially for the insurance companies it is a source of marine, goods in transit, engineering, plant and machinery, motor and other property and causality insurance premium. For a country whose the finance sector is not liberalized, FDI has become the influential source of insurance premium. In the case of Ethiopia it is clearly demonstrated in the manufacturing sector and construction sector. The demand for insurance business also increases as the employment opportunity and income of the society increases. Many researchers confirmed that FDI is influential and has positive impact on insurance premium. The researcher extracted the annual FDI amount as a variable as stated on National Bank of Ethiopia website.

3.5.8. Inflation

Inflation is the growth rate of consumer price index for each country. The premium that is going to be charged to cover of expected loss in the period of inflation. This is mainly because of the cost of recovering the loss increases from time to time and the value of products and services tends to increase from time to time. *Porntida Poontirakul (2012)* found price index is positively correlated with motor insurance premium. Annual inflation rate is taken by various researchers to explain the determinant of non life insurance premium

3.6. Summary of variables and hypothesis

Based on the above findings the following hypothesis is tested by researcher.

The type of variables, the measurement taken in the analysis and the expected influence is summarized in the following table.

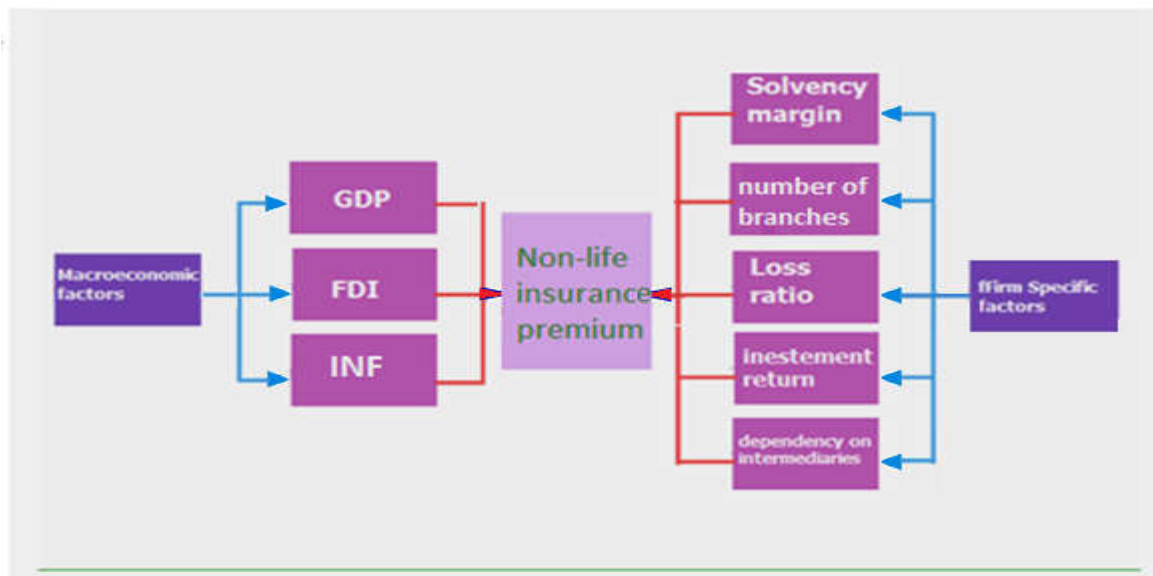
Table 3 Variables measurements and expected impact

| Variables | Measurement used | expected Impact |
|-----------------------------------|----------------------|------------------------|
| GWP= gross written premium | log GWP | explained variable |
| GDP = gross domestic product | Log GDP | + explanatory variable |
| FDI= foreign direct investment | Log FDI | + explanatory variable |
| INF= inflation | INF | + explanatory variable |
| SLM= solvency margin | Log SLM | + explanatory variable |
| LOR= loss ratio | Loss Ratio | + explanatory variable |
| NBR= number of branches | Number of branches | + explanatory variable |
| INR= investment return | log INR | + explanatory variable |
| DOI= dependency on intermediaries | log Sales Commission | + explanatory variable |

3.7. Conceptual framework

As discussed above insurance gross written premium is influenced by both internal and external factors. The researcher identified and included in his studies determinants of gross written premium are macroeconomic factors and firm specific factors. Among macroeconomic factors, GDP, foreign direct investment, inflation are studied in this study. Among firm specific factors, solvency margin, loss ratio, number of branches, investment return, and dependency on auxiliaries are considered in this study. This conceptual framework, that is the relation between gross written premium and macroeconomic and firm specific factors are illustrated below.

Figure 4 Conceptual framework of the study



Model developed by researcher based on literature review

3.8. Methodology

The degree of relationship between two variables can be studied using correlation analysis. However since gross written premium has a probability of distribution, to determine the impact of different variables regression analysis is required. Thus in order to point out the relation between variables regression analysis is the most important techniques as discussed by **Brook (2008)**. The researcher also reviewed the methodology used in previous studies in similar subject matter. The following accordingly the growth model of previous researchers is adopted and **Webb et al. (2002) and Eller et al.(2006) Wien(2015)** assuming constant returns to scale and perfect competition are sample of studies and the methodology used by previous researchers.

$$GWP = \alpha + \beta_1 GDP_{it} + \beta_2 INF_{it} + \beta_3 FDI_{it} + \beta_4 SLM_{it} + \beta_5 LOR_{it} + \beta_6 NBR_{it} + \beta_7 INR_{it} + \beta_8 DOI_{it} + \epsilon$$

Where: variables as represented by

GWP = gross written premium

GDP = gross domestic product

FDI = foreign direct investment

INF = inflation

SOLM = solvency margin

LOR = loss ratio

NBR = number of branches

INR = investment return

DOI = dependency on intermediaries

i is insurance companies 1.....8

t is number of years the number of years 1...14

And also

α = Constant or interpretation of the parameters

β is a coefficient of variables relationships where the estimator is true or efficient, linear or consistent, and unbiased.

And assuming

ϵ is error term assuming average value of the errors is zero, errors have constant variance and covariance between the error terms over time is zero. ie errors are uncorrelated; **Brook (2008)**

Accordingly the researcher selected and assumed multiple regressions model (MRM) is best fit for the study conducted. This model is appropriate where dependent variable is influenced by more than one independent variable.

3.9. Analysis techniques

It is known that data to be analyzed is a panel data of time serious with cross section of insurance companies. In this type of distribution of data analysis techniques that could be conducted are descriptive statistics, correlations, multiple linear regression analysis and inferential statistics. The researcher used “EViews” statistical software to analyze the data. In distractive statistics, the maximum, minimum, mean, and standard deviation of the 8 insurance companies panel data of dependent and independent variables to be discussed. Ordinary least square (OLS) method is used to identify the degree of significance of independent variables over the dependent variable. Inferential statistics are presented and described in the appropriate section of the study.

3.10. The Choice of Random or Fixed Model

The random model is appropriate where companies selected in the sample are selected randomly. On the other hand on fixed model, the entities in the sample effectively constitute the entire population; *Brooks (2008)*. To select the appropriate model, the common practice is conducting Hausman test. Hausman test is to be conducted where the number of cross section is greater than the number of coefficients to be estimated. In this study the coefficient is greater than the number of cross section. Therefore fixed effect model is used in the regression analysis.

CHAPTER FOUR

4. Analysis And Discussions

The following steps and analysis are conducted in this methodology.

4.1. Test for Classical linear regression model (CLRM) Assumptions

Regression is concerned with describing and evaluating the relationship between a given variable and one or more other variables. An assumption of the CLRM, has the appropriate theoretical interpretation, and has the right 'shape' (i.e. all signs on coefficients are correct' and all sizes of coefficients are 'correct' *Chris Brooks(2008)*

4.1.1. *The average value of the errors to be zero*

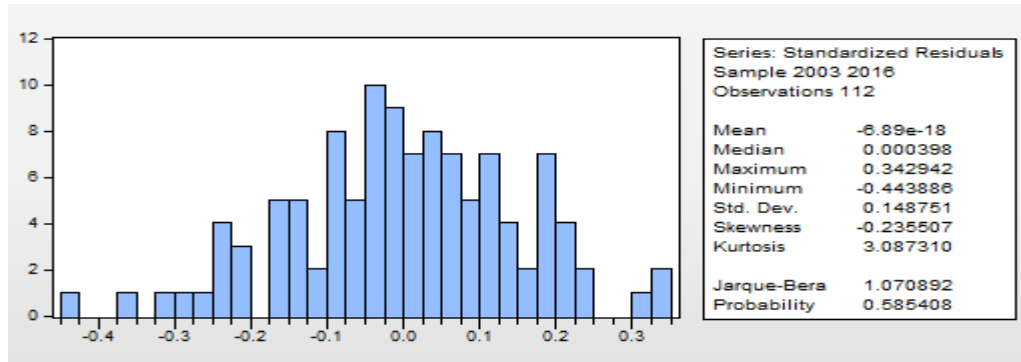
The regression equation has to include constant terms. If this is fulfilled the regression equation will never be violated. Thus in the model of this study a constant term is included. As a result this assumption was not violated.

4.1.2. *Normality Testing*

The values for Skewness and the Kurtosis indices have to be examined. Thus the normality assumption is to be tested. In this analysis the distribution of the independent variables measured at the interval or ratio-levels and dependent variables to check the normality assumption (*Gujarati, 2009*). If residuals or disturbance are normally distributed the histogram would be bell shaped. A normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3, p value would be >5% and skewness to be close to=0 meaning that data is distributed with normal distribution.

According to Eviews.8 result the descriptive statistics of all variables 14 years which have 112 observations is as follows.

Table 4 Jarqu-Bera Normality Test



Source| Financial Statement of Insurance Companies, NBE; Result| Eviews8; Own estimation

From the above the statistical results we can see that the normality assumption holds true. The histogram is a parabola diagram which confirms the normality assumption. The coefficient of kurtosis of closer to 3, p value is higher than 5% and skewness is small. According to statistical analyses we confirm normality and null hypothesis is to be accepted at significance level of 5%.

4.1.3. Heterokedasticity Test

In the presence of heteroscedasticity, the standard errors could be wrong and hence any inferences made could be misleading. It measures if regression has major difference from the residue of observation. To check this assumption White test was conducted for the model as shown below. The test result of F-statistic and Chi-Square proved there is no evidence for the presence of heteroscedasticity. This result is demonstrated by P value has >0 value. Accordingly the null hypothesis was not rejected which says that the error variance is constant.

Table 5. Heteroscedasticity Test

Heteroskedasticity Test: White

| | | | |
|---------------------|----------|---------------------|--------|
| F-statistic | 1.808117 | Prob. F(8,103) | 0.0838 |
| Obs*R-squared | 13.79197 | Prob. Chi-Square(8) | 0.0874 |
| Scaled explained SS | 9.228361 | Prob. Chi-Square(8) | 0.3234 |

Test Equation:
 Dependent Variable: RESID^2
 Method: Least Squares
 Date: 06/11/17 Time: 10:11
 Sample: 1 112
 Included observations: 112

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|--------|
| C | -0.094038 | 0.101088 | -0.930264 | 0.3544 |
| GDP^2 | 0.000330 | 0.000207 | 1.595744 | 0.1136 |
| FDI^2 | -0.000175 | 9.49E-05 | -1.843493 | 0.0681 |
| INR^2 | -9.99E-05 | 0.000258 | -0.387722 | 0.6990 |
| NBR^2 | -2.70E-05 | 2.40E-05 | -1.124112 | 0.2636 |
| SLM^2 | 0.000110 | 0.000282 | 0.389598 | 0.6976 |
| LOR^2 | 0.056044 | 0.032618 | 1.718199 | 0.0888 |
| INF^2 | -0.005942 | 0.108451 | -0.054787 | 0.9564 |
| DOI^2 | -0.000170 | 0.000258 | -0.658791 | 0.5115 |

| | | | |
|--------------------|----------|-----------------------|-----------|
| R-squared | 0.123143 | Mean dependent var | 0.035751 |
| Adjusted R-squared | 0.055037 | S.D. dependent var | 0.045173 |
| S.E. of regression | 0.043913 | Akaike info criterion | -3.336278 |
| Sum squared resid | 0.198618 | Schwarz criterion | -3.117827 |
| Log likelihood | 195.8316 | Hannan-Quinn criter. | -3.247645 |
| F-statistic | 1.808117 | Durbin-Watson stat | 1.476058 |
| Prob(F-statistic) | 0.083818 | | |

Source| Financial Statement of Insurance Companies, NBE; Result| Eviews8; Own estimation

4.1.4. *Multicollinearity Test*

Multicollinearity describes the relationship among explanatory variables. It is to test if substantial correlations exist among the independent variable. If there is substantial correlation exists among independent variables, the estimate of sample variables would be inefficient since it would likely to have high standard errors. Under this situation the estimation would lead to undesirables result. Moreover the result of correlated independent variable would be redundant and add no additional value the analysis.

Table 6. Multicollinearity Test

| | GDP | FDI | INR | NBR | SLM | LOR | INF | DOI |
|-----|------|------|------|-------|-------|------|------|-----|
| GDP | 1 | | | | | | | |
| FDI | 0.85 | 1 | | | | | | |
| INR | 0.80 | 0.68 | 1 | | | | | |
| NBR | 0.66 | 0.55 | 0.75 | 1 | | | | |
| SLM | 0.78 | 0.63 | 0.86 | 0.68 | 1 | | | |
| LOR | 0.13 | 0.12 | 0.25 | 0.13 | 0.03 | 1 | | |
| INF | 0.11 | 0.22 | 0.01 | -0.01 | -0.04 | 0.19 | 1 | |
| DOI | 0.69 | 0.62 | 0.85 | 0.83 | 0.71 | 0.34 | 0.08 | 1 |

Source| Financial Statement of Insurance Companies, NBE; Result| Eviews8; Own estimation

The Eviews result of multicollinearity indicated that there is high correlation between in few independent variables. For example highest multicollinearity was shown between investment return with solvency margin with a value of 0.86. The researcher ignored this multicollinearity because of the way of the amount of independent variable generated is different. On the other hand the threshold of multicolliniarity and no multicollinearity problem is considered among the independent and the dependent variables as 0.80 (*Bryman and Cramer, 2009*) and 0.90(*Hair et al., 2009*).

4.1.5. Correlation Test

In this section Pearson correlation analysis is conducted. The correlation of all dependent and independent variable is tested. If it is stated that y and x are correlated, it means that y and x are being treated in a completely symmetrical way. *Brooks(2008)*. Therefore the correlation between dependent variable and independent variable is high means the model fits the data well. Eviews output is for this analysis is shown below.

Table 7. Correlation Test

| | GWP | GDP | FDI | DOI | INF | INR | LOR | NBR | SLM |
|-----|------|------|------|------|-------|------|------|------|-----|
| GWP | 1 | | | | | | | | |
| GDP | 0.78 | 1 | | | | | | | |
| FDI | 0.66 | 0.85 | 1 | | | | | | |
| DOI | 0.95 | 0.69 | 0.62 | 1 | | | | | |
| INF | 0.10 | 0.11 | 0.22 | 0.08 | 1 | | | | |
| INR | 0.93 | 0.80 | 0.68 | 0.85 | 0.01 | 1 | | | |
| LOR | 0.30 | 0.13 | 0.12 | 0.34 | 0.19 | 0.25 | 1 | | |
| NBR | 0.82 | 0.66 | 0.55 | 0.83 | -0.01 | 0.75 | 0.13 | 1 | |
| SLM | 0.82 | 0.78 | 0.63 | 0.71 | -0.04 | 0.86 | 0.03 | 0.68 | 1 |

Source| Financial Statement of Insurance Companies, NBE; Result| Eviews8; Own estimation

The Eviews result shows the correlation between gross written premium and dependant variables have high correlation except inflation and loss ratio. Among the independent variables the dependency on intermediaries found to be the best fit to express the result in the model.

4.1.6. Autocorrelation Test

Autocorrelation test is test for correlation between the errors in period t with bullies' error in periodt-1 (previous period) in the linear regression model. **(Rafika and Muhamad,(2012)**. It is assumed that errors are linearly independent of one another. If the errors are not uncorrelated with one another, it would be stated that they are 'auto correlated' or that they are 'serially correlated **Brooks (2008)**.In other words covariance between error terms is 0 overtime. $Cov(u_i, u_j) = 0$ for $i = j$ For this Durbin-Watson (DW) is used to test the independent variables of errors (autocorrelation).

As discussed before the model to be used for this quantitative research is multiple regression analysis using Ordinary Least Squares (OLS). Before conducting this analysis the researcherhave tested the entire necessary precondition with regard to the distribution of data distribution and behaviors with one another. As discussed above these are: normality tests, heterokedasticity test, multicollinarity test. Now again the Eviews8 software is used to conduct the autocorrelation analysis. Here is the result of estimation of dependent and independent variables selected by the researcher.

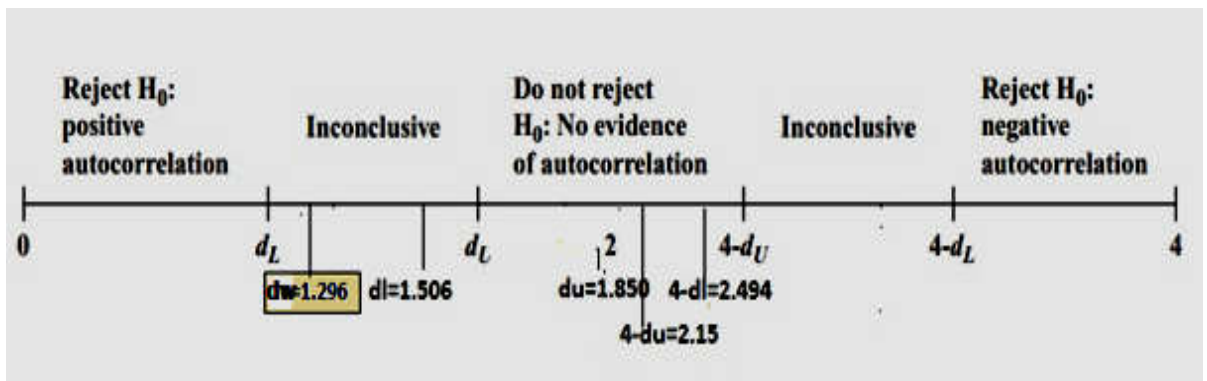
The aggregate result of 8 selected companies over the period of 14 years (112 observations) is analyzed and estimated using ordinary least squares (OLS) regression analysis as follows.

Table 8. Ordinary least square (OLS) Estimation

| Dependent Variable: GWP Method: Panel Least Squares Date: 06/11/17 Time: 08:59 Sample: 2003 2016 Periods included: 14 Cross-sections included: 8 Total panel (balanced) observations: 112 | | | | |
|---|-------------|-----------------------|-------------|--------|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| GDP | 0.352012 | 0.075294 | 4.675167 | 0.0000 |
| FDI | -0.031020 | 0.014104 | -2.199326 | 0.0303 |
| INR | 0.090003 | 0.038262 | 2.352277 | 0.0207 |
| NBR | 0.010479 | 0.006995 | 1.497947 | 0.1374 |
| SLM | 0.016154 | 0.094144 | 0.171590 | 0.8641 |
| LOR | -0.026123 | 0.181649 | -0.143813 | 0.8859 |
| INF | 0.398099 | 0.184786 | 2.154381 | 0.0337 |
| DOI | 0.365110 | 0.053953 | 6.767215 | 0.0000 |
| C | 2.238344 | 1.045387 | 2.141163 | 0.0348 |
| Effects Specification | | | | |
| Cross-section fixed (dummy variables) | | | | |
| R-squared | 0.979325 | Mean dependent var | 18.36632 | |
| Adjusted R-squared | 0.976095 | S.D. dependent var | 1.034520 | |
| S.E. of regression | 0.159951 | Akaike info criterion | -0.696337 | |
| Sum squared resid | 2.456090 | Schwarz criterion | -0.307980 | |
| Log likelihood | 54.99486 | Hannan-Quinn criter. | -0.538768 | |
| F-statistic | 303.1540 | Durbin-Watson stat | 1.295720 | |
| Prob(F-statistic) | 0.000000 | | | |

Source| Financial Statement of Insurance Companies, NBE; Result| Eviews8; Own estimation

Hence, $\hat{\rho} = 0$, DW result the estimation is to be =1.296 which falls in below the lower DL, this is an indicator of positive autocorrelation.



Then the researcher forced to test Breusch Godfrey Serial correlation LM test form 1 to 5 lags and found the following.

Table 9 Breusch Godfrey Serial correlation LM test

| Breusch-Godfrey Serial Correlation LM Test | | | | |
|---|-------------|-----------------------|-------------|--------|
| F-statistic | 6.223089 | Prob. F(5,98) | 0.0000 | |
| Obs*R-squared | 26.99081 | Prob. Chi-Square(5) | 0.0001 | |
| Test Equation: | | | | |
| Dependent Variable: RESID | | | | |
| Method: Least Squares | | | | |
| Date: 06/11/17 Time: 10:42 | | | | |
| Sample: 1 112 | | | | |
| Included observations: 112 | | | | |
| Presample missing value lagged residuals set to zero. | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| GDP | -0.022125 | 0.041772 | -0.529666 | 0.5975 |
| FDI | 0.011437 | 0.014899 | 0.767687 | 0.4445 |
| DOI | -0.014269 | 0.032209 | -0.443021 | 0.6587 |
| INF | -0.167954 | 0.185040 | -0.907663 | 0.3663 |
| INR | -0.008520 | 0.030653 | -0.277966 | 0.7816 |
| LOR | 0.066323 | 0.177418 | 0.373821 | 0.7093 |
| NBR | 0.002607 | 0.004436 | 0.587656 | 0.5581 |
| SLM | 0.010834 | 0.039666 | 0.273144 | 0.7853 |
| C | 0.425855 | 0.811404 | 0.524837 | 0.6009 |
| RESID(-1) | 0.488379 | 0.102007 | 4.787704 | 0.0000 |
| RESID(-2) | 0.024664 | 0.112712 | 0.218825 | 0.8272 |
| RESID(-3) | -0.111227 | 0.112723 | -0.986733 | 0.3262 |
| RESID(-4) | -0.113804 | 0.112053 | -1.015624 | 0.3123 |
| RESID(-5) | 0.091453 | 0.102865 | 0.889052 | 0.3762 |
| R-squared | 0.240989 | Mean dependent var | -1.18E-15 | |
| Adjusted R-squared | 0.140304 | S.D. dependent var | 0.189930 | |
| S.E. of regression | 0.176102 | Akaike info criterion | -0.519032 | |
| Sum squared resid | 3.039185 | Schwarz criterion | -0.179220 | |
| Log likelihood | 43.06582 | Hannan-Quinn criter. | -0.381160 | |
| F-statistic | 2.393496 | Durbin-Watson stat | 1.962725 | |
| Prob(F-statistic) | 0.007737 | | | |

Source| Financial Statement of Insurance Companies, NBE; Result| Eviews8; Own estimation

The p value of Breusch-Godfrey Serial Correlation LM test is less than 0. The problem of serial correlation is exists and the OLS estimation method is dropped by the researcher and tried to find appropriate method of estimation.

4.2. Dynamic Panel Regression: - the Generalized Method of Moments (GMM)

As shown above the autocorrelation problem has to be removed in order to estimate the gross written premium. The researcher used generalized method of moments (GMM) which deals with removal of autocorrelation with **first difference**. The researcher used this estimation following the method of estimation was used by Arellano-Bond estimation applied by Arellano & Bond (1991), Arellano Bover estimation by Arellano & Bover (1995) and Lenka Cepelakova(2015). More over the researcher used GMM model because it can be used as statistical method for analyzing of economic data to estimate unknown parameter, it can be used for time series, panel or cross sectional data and it is equivalent to OLS estimator.

After application of the transformation the following equation exists which is autoregressive with first difference.

$$\Delta GWP_i = \alpha \Delta GWP_{it-1} + \beta_1 \Delta GDP_{it} + \beta_2 \Delta INF_{it} + \beta_3 \Delta FDI_{it} + \beta_4 \Delta SLM_{it} + \beta_5 \Delta LOR_{it} + \beta_6 \Delta NBR_{it} + \beta_7 \Delta INR_{it} + \beta_8 \Delta DOI_{it} + \Delta \epsilon$$

Table 10 Generalized Method of Moments (GMM) Estimation

| Dependent Variable: GWP | | | | |
|---|-------------|--------------------|-------------|--------|
| Method: Panel Generalized Method of Moments | | | | |
| Transformation: First Differences | | | | |
| Date: 06/11/17 Time: 11:43 | | | | |
| Sample (adjusted): 2005 2016 | | | | |
| Periods included: 12 | | | | |
| Cross-sections included: 8 | | | | |
| Total panel (balanced) observations: 96 | | | | |
| Difference specification instrument weighting matrix | | | | |
| Instrument specification: GWP GWPLAG1 GDP FDI DOI INF INR LOR NBR SLM | | | | |
| Constant added to instrument list | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| GWPLAG1 | -0.106900 | 0.087917 | -1.215921 | 0.2273 |
| GDP | 0.466980 | 0.119006 | 3.924001 | 0.0002 |
| FDI | -0.039810 | 0.013014 | -3.059117 | 0.0030 |
| DOI | 0.449244 | 0.059281 | 7.578214 | 0.0000 |
| INF | 0.224537 | 0.151792 | 1.479241 | 0.1427 |
| INR | 0.083010 | 0.037885 | 2.191082 | 0.0311 |
| LOR | -0.042177 | 0.177243 | -0.237963 | 0.8125 |
| NBR | -0.002123 | 0.010119 | -0.209799 | 0.8343 |
| SLM | -0.033928 | 0.114729 | -0.295727 | 0.7681 |
| Effects Specification | | | | |
| Cross-section fixed (first differences) | | | | |
| Mean dependent var | 0.187357 | S.D. dependent var | 0.209783 | |
| S.E. of regression | 0.156956 | Sum squared resid | 2.143275 | |
| J-statistic | 76.98365 | Instrument rank | 10 | |
| Prob(J-statistic) | 0.000000 | | | |

Source| Financial Statement of Insurance Companies, NBE; Result| Eviews8; Own estimation

Test of autocorrelation

In using generalized method of moments (GMM) the autocorrelation test is to be conducted using Arellano-Bond test because it is valid for GMM estimation with fixed effects. Accordingly the following result is obtained.

Table 11 Arellano-Bond Serial Correlation Test

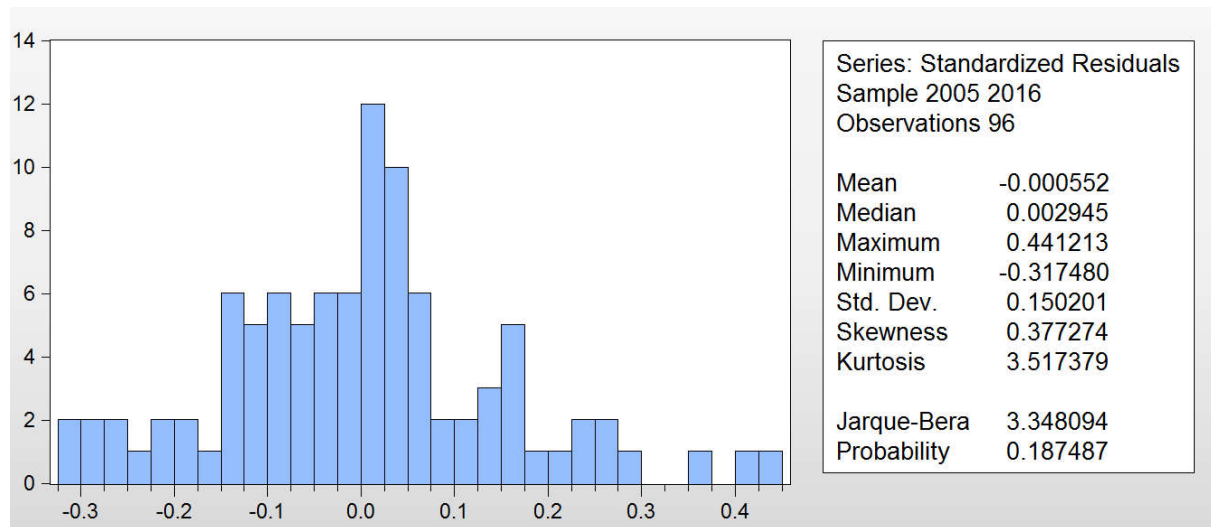
| Arellano-Bond Serial Correlation Test | | | | |
|---------------------------------------|-------------|-----------|----------|--------|
| Equation: Untitled | | | | |
| Date: 06/11/17 Time: 11:49 | | | | |
| Sample: 2003 2016 | | | | |
| Included observations: 96 | | | | |
| Test order | m-Statistic | rho | SE(rho) | Prob. |
| AR(1) | -2.564204 | -0.483061 | 0.188387 | 0.0103 |
| AR(2) | 0.758528 | 0.173722 | 0.229025 | 0.4481 |

Source| Financial Statement of Insurance Companies, NBE; Result| Eviews8; Own estimation

As shown above the Arellando bond serial correlation test indicates the p value is more than 5%. Thus it is now possible to do estimation using GMM model.

The following is the result of normality test of generalized method of moments estimation result.

Table 12 Normality Test as per GMM Estimation



Source| Financial Statement of Insurance Companies, NBE; Result| Eviews8; Own estimation

The following is generalized method of moments estimation

Table 13 GMM estimation indicating significant influencing factors

Dependent Variable: GWP
 Method: Panel Generalized Method of Moments
 Transformation: First Differences
 Date: 06/11/17 Time: 11:43
 Sample (adjusted): 2005 2016
 Periods included: 12
 Cross-sections included: 8
 Total panel (balanced) observations: 96
 Difference specification instrument weighting matrix
 Instrument specification: GWP GWPLAG1 GDP FDI DOI INF INR LOR NBR SLM
 Constant added to instrument list

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|---------|
| GWPLAG1 | -0.106900 | 0.087917 | -1.215921 | 0.2273 |
| GDP | 0.466980 | 0.119006 | 3.924001 | 0.0002* |
| FDI | -0.039810 | 0.013014 | -3.059117 | 0.0030* |
| DOI | 0.449244 | 0.059281 | 7.578214 | 0.0000* |
| INF | 0.224537 | 0.151792 | 1.479241 | 0.1427 |
| INR | 0.083010 | 0.037885 | 2.191082 | 0.0311* |
| LOR | -0.042177 | 0.177243 | -0.237963 | 0.8125 |
| NBR | -0.002123 | 0.010119 | -0.209799 | 0.8343 |
| SLM | -0.033928 | 0.114729 | -0.295727 | 0.7681 |

Effects Specification

| Cross-section fixed (first differences) | | | |
|---|----------|--------------------|----------|
| Mean dependent var | 0.187357 | S.D. dependent var | 0.209783 |
| S.E. of regression | 0.156956 | Sum squared resid | 2.143275 |
| J-statistic | 76.98365 | Instrument rank | 10 |
| Prob(J-statistic) | 0.000000 | | |

Source| Financial Statement of Insurance Companies, NBE; Result| Eviews8; Own estimation

*Denotes that there is significant influence on gross written premium more than 95% confidence level.

And the estimated command and the estimated equation for the GMM model are as follows.

Estimation Command:

```

=====
GMM(?,CX=FD) GWP GWPLAG1 GDP FDI DOI INF INR LOR NBR SLM C @ GWP GWPLAG1 GDP FDI DOI
INF INR LOR NBR SLM
  
```

Estimation Equation:

```

=====
@DADJ(GWP) = C(1)*@DADJ(GWPLAG1) + C(2)*@DADJ(GDP) + C(3)*@DADJ(FDI) + C(4)*@DADJ(DOI) +
C(5)*@DADJ(INF) + C(6)*@DADJ(INR) + C(7)*@DADJ(LOR) + C(8)*@DADJ(NBR) + C(9)*@DADJ(SLM)
  
```


Substituted Coefficients:

=====

@DADJ(GWP) = -0.106899634712*@DADJ(GWPLAG1) + 0.466980238392*@DADJ(GDP) - 0.0398103185591*@DADJ(FDI) + 0.449243968706*@DADJ(DOI) + 0.224536675308*@DADJ(INF) + 0.0830097767321*@DADJ(INR) - 0.0421771103636*@DADJ(LOR) - 0.00212287046836*@DADJ(NBR) - 0.0339284958384*@DADJ(SLM)

4.3. Result Analysis, Comparison with Previous Studies And Discussions

1. Gross domestic product(GDP)

In this section determinants of the growth of non life insurance premium is described as per each hypothesis. What was hypothesized and what is the actual relationship is revealed based on the analysis.

Hypothesis 1 (H1)

| Variable | Coefficient | Prob. |
|------------------------------|-------------|--------|
| Gross Domestic Product (GDP) | 0.46698 | 0.0002 |

The growth of gross domestic product (GDP) has positive relationship and found to be very significant determinant of the growth of non life insurance premium of private insurance companies of Ethiopia. Therefore, H1 is accepted.

Many studies confirmed that gross domestic product has significant influence of the gross written premium. As stated in the literature review, *Casper Christophersen and Petr Jakubik, (2014)*, *Haiss Æ KjellSu`megi (2015)*, *Pradhana, et al (2014)*, *Beenstock, M. Dickinson, G. and Khajuria, S. (1988)*, *JF Outreville (1990)* investigated that there is parallel and rapid growth in both gross domestic product and insurance premium growth. In this study the researcher also found and confirmed that there is strong relationship and positive impact of gross domestic product and non life insurance premium of private insurance companies of Ethiopia.

2. Foreign Direct Investment(FDI)

Hypothesis 2 (H2)

| Variable | Coefficient | Prob. |
|---------------------------------|-------------|-------|
| Foreign Direct Investment (FDI) | -0.03981 | 0.003 |

The growth of foreign direct investment (FDI) has negligible negative impact but have significant determinant of growth of non life insurance premium of private insurance companies in Ethiopia. However this impact is insignificant as the percentage is the coefficient is nearly = 0. Therefore, H2 is accepted.

Foreign direct investment is a speed up the growth of emerging economy. It is an injection of resources by which insurance companies boost their production. Accordingly the researcher assumed it has significant effect on growth of insurance premium. Empirical studies conducted by previous researchers had confirmed this fact; *Cuizhen Zhang and Nong Zhu (2010)Ma and Pope (2003)Li, Moshirian, and Sim (2003)*. According this study, the p value is 0 which means the variable has strong relationship with non life gross written premium.

3. Inflation (INF)

Hypothesis 3 (H3)

| Variable | Coefficient | Prob. |
|-----------------|-------------|--------|
| Inflation (INF) | 0.224537 | 0.1427 |

The growth of inflation (INF) has positive impact on growth of non life insurance premium with confidence level of 86% in private insurance companies in Ethiopia. Therefore, H3 is not accepted.

According to previous studies the impact of inflation on gross written premium varies depending on the inflationary period. An empirical study conducted by the World Bank confirms inflation seems to promote larger non-life premiums (*Lester, 2002*) similarly, by *MihailPetkovski and Kjosevski Jordan (2014)*. The result of this study also confirmed that inflation has positive impact with 86% confidence level.

4. Solvency Margin (SLM)

Hypothesis 4 (H4)

| Variable | Coefficient | Prob. |
|-----------------------|-------------|--------|
| Solvency Margin (SLM) | -0.033928 | 0.7681 |

The growth of solvency margin has negative but negligible relationship with 24% confidence level with growth of non life insurance premium of private insurance companies in Ethiopia. The sign of negative can be interpreted as the growth rate of solvency margin is diminishing as compared to the growth rate of premium over time. This shows that the rate of absorption of risk (liability) of private insurance companies increases as the rate of growth of non life insurance premium of private insurance companies in Ethiopia. Therefore, H4 is not accepted.

The researcher introduced this variable since it is the major influential factor for insurance companies' image. It is the main factor to evaluate the financial soundness. However as insurance companies are under supervision of regulatory body, it might be assumed all

insurance companies are financially sound. However the researcher wants to test its sensitivity to gross written premium if it has comparative advantage to those who have better position. On the other hand rapid premium growth would lead to insolvency; *Janotta-Simons, F (1999), Leflaive, V (2002), Kim et al.(1995)*. Accordingly with fear of insolvency the researcher assumed some insurance companies may adjust their rapid growth also. According to the imperial analysis of this study it is found that it is not influential factor for the growth of insurance premium. On the contrary, although it very insignificant coefficient it is negatively correlated with growth of non life insurance premium. This indicates that insurance companies are accumulating high risk through time as compared to the growth of insurance premium.

5. Loss Ratio (LOR)

Hypothesis 5 (H5)

| Variable | Coefficient | Prob. |
|------------------|-------------|--------|
| Loss Ratio (LOR) | -0.042177 | 0.8125 |

The growth of loss ratio has negligible negative impact with 19% confidence level on growth of non life insurance premium of private insurance companies in Ethiopia. However the coefficient is nearly = 0 that means that although it has negative impact the effect is negligible. Therefore, H5 is not accepted.

As discussed in the literature review loss ratio is reflection of the price of insurance. Since price is the major determinant factor for sales, the researcher introduced this variable to test its impact on non life insurance premium. Previous study on such relationship revealed that there is negative relationship between premium growth and change in loss ratio; *Barth and Eckles (2009)*. This study also confirmed same result. As researcher refer in previous chapter that the market of Ethiopian non life insurance sector is characterized by continues price cutting by all insurance companies, it become difficult to point out its effect from the analysis. The study result showed that it is not the major determinant factor as all companies behave in similar fashion.

6. Number of Branches (NBR)

Hypothesis 6 (H6)

| Variable | Coefficient | Prob. |
|--------------------------|-------------|--------|
| Number of branches (NBR) | -0.002123 | 0.8343 |

The growth of number of branches has negligible impact with 17% confidence level on growth of non life insurance premium of private insurance companies in Ethiopia. Therefore, H6 is not accepted.

The researcher wants to test accessibility is one of the characteristics of insurance services. There were also evidences that market expansion through branch network has demonstrated positive result in premium growth; *Lietivos Bankas (2015), Swiss Re (2015)*. According to this study numbers of branches are not the major significant factor for premium growth. This is maybe they are working door to door or their attachments to customers are influenced by other factors. For example according to this study dependency on intermediaries is the most influential factor

7. Investment Return (INR)

Hypothesis 7 (H7)

| Variable | Coefficient | Prob. |
|-------------------------|-------------|--------|
| Investment return (INR) | 0.08301 | 0.0311 |

The growth of investment return has slightly positive impact with very significant level of 97% on growth of gross written premium. Therefore, H7 is accepted.

There are evidences where insurance companies are reducing their premium with a dependency on the investment return; *Confederation of Insurance Industry (CII) and Ernst & Young, (2012)*, On the other hand grabbing more premiums boosts their capacity of investment. Accordingly the researcher wants to test the behavior of investment return in relation to growth of non life insurance premium. The study result showed that investment return has direct and significant relationship with growth of non life insurance premium.

8. Dependency on Intermediaries (DOI)

Hypothesis 8 (H8)

| Variable | Coefficient | Prob. |
|------------------------------------|-------------|--------|
| Dependency on intermediaries (DOI) | 0.449244 | 0.0000 |

The growth of dependency on intermediaries has very significant impact on growth of non life insurance premium of private insurance companies in Ethiopia. Therefore, H8 is accepted.

Many assessments and reports showed that the role of intermediaries that is agents and brokers are the most influential factor for growth of non life insurance premium; *Insurance Europe (2015), Insurance Brokers Association of India (IBAI) (2016) and Independent Insurance Agents and Brokers of America (2016)*. The researcher wants to confirm this relationship with practical evidences in with Ethiopian context. Accordingly the study result showed that among all the independent variables the role of intermediaries become the most influential factor for growth of non life insurance premium.

CHAPTER FIVE

5. Conclusion and Recommendation

Conclusion

In summary the study result confirmed the significant determinants of non life insurance premium in Ethiopia. Accordingly gross domestic product, foreign direct investment, investment return and dependency on intermediaries are the most significant influential factors of non life insurance premium growth of private insurance companies of Ethiopia. Next to these most influential factors inflation follows with 86% confidence level. Other factors that were assumed to be determinants of non life insurance premium like loss ratio, solvency and number of branches are found to be not significant influencing factor of non life insurance premium in Ethiopia according to this study.

In to arrive on this conclusion the researcher conducted quantitative analysis in the subject matter. Due to serial correlation problem found in the data the researcher dropped ordinary least square (OLS) method of regression analysis and used Dynamic Panel Regression using the Generalized Method of Moments (GMM). The data collected and used for estimation covers 8 private insurance companies from year 2002/03 to 2015/16.

In the course of the study the researcher identified that loss ratio was not and should not have been competitive factor for growth of insurance premium as the coefficient of solvency margin is negatively correlated to gross written premium although it is very small, -0.04. The study revealed that loss ratio was not the significant factor for premium increase. On the other hand the empirical analysis pointed out that solvency margin was not influential factor for the growth of insurance premium. On the contrary, it is negatively correlated with growth of non life insurance premium. This indicates the rate of accumulation of risk of private insurance companies' increases as compared to the growth of insurance premium.

Recommendation

During literature review the researcher faced many problems in finding references of study results on the same topic. This indicates that the determinants of non life insurance premium in Ethiopia were not extensively studied so far. This study have its own contribution for future reference in the field of the same study as many studies were not conducted on the determinants of non life insurance premium in Ethiopia. However this study is not and cannot be comprehensive study to conclude the major determinants of non life insurance premium of private insurance companies of Ethiopia. Insurance companies, other stakeholders would benefit from the result of the study in considering the determinants of the growth of non life insurance premium in private insurance company in Ethiopia.

In order to close the research gap in this field of study I recommend more research must be conducted in the future. In order to maintain steady growth in insurance premium insurers have to draw their attention on study results of determinant factors in different economic situation and period.

As discussed in non life insurance in Ethiopia overview, the penetration and density of non life insurance in Ethiopia is insignificant as compared to developed countries. Besides to the determinants confirmed by this study, extensive studies have to be done in area of public awareness new product development and the like to boost insurance premium. As shown in this study price cut or loss ratio was not the determinant factor for non life insurance premium growth in Ethiopia. Instead the researcher suggests harvesting of new business has to be given more attention through tapping of economic growth and other determinant factors as shown in this study. Steady growth of premium could be achieved through market strategy based on adequate quantitative and qualitative research conducted on the subject matter. More over as insurance business is a service providing sector it has much qualitative nature. The researcher recommends more quantitative and qualitative research to be conducted on the subject matter.

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Appendices

Appendix 1 List of Insurance companies and their date of establishment

| sn | Insurance Companies in Ethiopia | Date of Establishment |
|----|----------------------------------|-----------------------|
| 1 | Ethiopian Insurance Corporation | 1975 |
| 2 | Awash Insurance Comp. S.C | 1/10/1994 |
| 3 | Africa Insurance Comp. S.C | 1/12/1994 |
| 4 | National Ins. Comp. of Eth. S.C. | 23/09/1994 |
| 5 | Nyala Insurance Comp. S.C | 6/1/1995 |
| 6 | Nile Insurance Comp. S.C | 11/4/1995 |
| 7 | The United Insurance S.C | 1/4/1997 |
| 8 | Global Insurance Comp. S.C. | 11/1/1997 |
| 9 | NIB Insurance Comp. | 1/5/2002 |
| 10 | Lion Insurance Comp. S.C | 1/7/2007 |
| 11 | Ethio-Life and General Ins. S.C. | 23/10/2008 |
| 12 | Oromia Insurance Comp. S.C. | 26/01/2009 |
| 13 | Abay Insurance Comp. | 26/07/2010 |
| 14 | Berhan Insurance S.C. | 24/05/2011 |
| 15 | Tsehay Insurance S.C. | 28/03/2012 |
| 16 | Lucy Insurance S.C. | 1/10/2012 |
| 17 | Bunna Insurance S.C. | 21/05/2013 |

Source| National Bank of Ethiopia

Appendix 2 Number of Branches of Ethiopian Insurance Companies

| | EIC | Awash | Global | Nile | NICE | Africa | NIB | Nyala | UNIC | Lion | Ethio-Life | Oromia | Abay | Berhan | Tsehay | Lucy | Bunna |
|---------|-----|-------|--------|------|------|--------|-----|-------|------|------|------------|--------|------|--------|--------|------|-------|
| 2002/03 | 27 | 13 | 4 | 16 | 8 | 9 | 4 | 11 | 14 | | | | | | | | |
| 2003/04 | 28 | 13 | 5 | 17 | 11 | 9 | 9 | 12 | 17 | | | | | | | | |
| 2004/05 | 32 | 14 | 5 | 18 | 11 | 9 | 13 | 14 | 17 | | | | | | | | |
| 2005/06 | 34 | 15 | 5 | 18 | 12 | 9 | 13 | 15 | 17 | | | | | | | | |
| 2006/07 | 36 | 18 | 6 | 18 | 12 | 9 | 14 | 15 | 18 | | | | | | | | |
| 2007/08 | 37 | 21 | 7 | 19 | 14 | 13 | 16 | 16 | 19 | 10 | | | | | | | |
| 2008/09 | 39 | 22 | 7 | 20 | 16 | 13 | 21 | 16 | 21 | 10 | | 9 | | | | | |
| 2009/10 | 39 | 26 | 10 | 20 | 16 | 13 | 21 | 16 | 22 | 11 | | 14 | 3 | | | | |
| 2010/11 | 41 | 29 | 10 | 21 | 16 | 13 | 22 | 16 | 23 | 11 | | 16 | 3 | | | | |
| 2011/12 | 46 | 31 | 10 | 21 | 17 | 13 | 22 | 18 | 23 | 11 | | 19 | 3 | 6 | 3 | | |
| 2012/13 | 48 | 32 | 11 | 24 | 19 | 13 | 23 | 21 | 24 | 16 | 4 | 21 | 7 | 7 | 5 | | |
| 2013/14 | 62 | 33 | 11 | 28 | 21 | 15 | 25 | 21 | 28 | 20 | 7 | 25 | 14 | 7 | 8 | 3 | 4 |
| 2014/15 | 66 | 36 | 12 | 31 | 22 | 18 | 28 | 23 | 28 | 25 | 12 | 29 | 17 | 7 | 8 | 5 | 10 |
| 2015/16 | 70 | 38 | 13 | 36 | 29 | 22 | 30 | 23 | 28 | 28 | 16 | 33 | 19 | 8 | 12 | 8 | 13 |

Source| National Bank of Ethiopia, Financial Statement of Insurance Companies

Appendix 3 Descriptive Statistics of Variables as per measurements used by researcher

| | GWP | GDP | FDI | DOI | INF | INR | LOR | NBR | SLM |
|--------------|--------|--------|--------|--------|------|--------|------|--------|--------|
| Mean | 18.4 | 26.6 | 22.4 | 15.2 | 0.1 | 15.7 | 0.7 | 17.5 | 17.7 |
| Median | 18.5 | 26.6 | 23.1 | 15.3 | 0.1 | 16.0 | 0.7 | 16.5 | 17.6 |
| Maximum | 20.0 | 28.1 | 24.6 | 17.2 | 0.4 | 18.2 | 0.9 | 38.0 | 19.6 |
| Minimum | 15.5 | 25.0 | 16.1 | 11.0 | 0.0 | 11.6 | 0.4 | 4.0 | 15.8 |
| Std. Dev. | 1.0 | 1.0 | 2.3 | 1.3 | 0.1 | 1.5 | 0.1 | 7.4 | 0.9 |
| Skewness | -0.6 | -0.1 | -1.5 | -0.9 | 1.1 | -0.6 | 0.0 | 0.5 | 0.1 |
| Kurtosis | 2.8 | 1.6 | 4.5 | 3.8 | 2.9 | 2.7 | 2.4 | 3.0 | 2.3 |
| Jarque-Bera | 6.1 | 8.8 | 54.2 | 17.6 | 21.7 | 7.0 | 1.5 | 5.0 | 2.5 |
| Probability | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.1 | 0.3 |
| Sum | 2057.0 | 2975.0 | 2505.5 | 1701.8 | 16.5 | 1758.0 | 73.2 | 1963.0 | 1983.5 |
| Sum Sq. Dev. | 118.8 | 113.4 | 593.8 | 190.8 | 1.1 | 259.7 | 1.5 | 6049.9 | 98.1 |
| Observations | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |

Source| National Bank of Ethiopia, Financial Statement of Insurance Companies

Appendix 4 Type of non life insurance service provided by Ethiopian insurance companies

Fire and Allied Perils
Burglary & House Breaking
Consequential Loss (Business Interruption)
Motor-Commercial Vehicle (own damage and third party)
Motor-Private Vehicle (own damage and third party)
Marine (Cargo and Hull)
Goods-in-Transit
Bonds
Engineering
Horticulture
Personal/Group Personal Accident
Fidelity Guarantee
Money
Plate Glass
Product Liability
Professional Indemnity
Public Liability
Condominium Insurance (recently introduced by few companies)
Crop Insurance (recently introduced by few companies)

Appendix 5 Generalized Method of Moments (GMM) Estimation

Dependent Variable: GWP

Method: Panel Generalized Method of Moments

Transformation: First Differences

Date: 06/11/17 Time: 11:43

Sample (adjusted): 2005 2016

Periods included: 12

Cross-sections included: 8

Total panel (balanced) observations: 96

Difference specification instrument weighting matrix

**Instrument specification: GWP GWPLAG1 GDP FDI DOI INF INR LOR NBR
SLM**

Constant added to instrument list

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|--------|
| GWPLAG1 | -0.106900 | 0.087917 | -1.215921 | 0.2273 |
| GDP | 0.466980 | 0.119006 | 3.924001 | 0.0002 |
| FDI | -0.039810 | 0.013014 | -3.059117 | 0.0030 |
| DOI | 0.449244 | 0.059281 | 7.578214 | 0.0000 |
| INF | 0.224537 | 0.151792 | 1.479241 | 0.1427 |
| INR | 0.083010 | 0.037885 | 2.191082 | 0.0311 |
| LOR | -0.042177 | 0.177243 | -0.237963 | 0.8125 |
| NBR | -0.002123 | 0.010119 | -0.209799 | 0.8343 |
| SLM | -0.033928 | 0.114729 | -0.295727 | 0.7681 |

Effects Specification

Cross-section fixed (first differences)

| | | | |
|--------------------|----------|--------------------|----------|
| Mean dependent var | 0.187357 | S.D. dependent var | 0.209783 |
| S.E. of regression | 0.156956 | Sum squared resid | 2.143275 |
| J-statistic | 76.98365 | Instrument rank | 10 |
| Prob(J-statistic) | 0.000000 | | |