

***FACTORS AFFECTING PROFITABILITY OF INSURANCE  
COMPANIES IN ETHIOPIA: PANEL EVIDENCE***

***A THESIS SUBMITTED TO THE DEPARTMENT OF ECONOMICS AS  
PARTIAL FULFILLMENT FOR THE AWARD OF DEGREE OF MASTER  
OF SCIENCE IN ECONOMICS (ECONOMIC POLICY ANALYSIS)***

**By:  
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**JIMMA UNIVERSITY  
COLLEGE OF BUSINESS AND ECONOMICS  
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MSC PROGRAM**

**JIMMA, ETHIOPIA  
MAY 14, 2018**

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## **DECLARATION**

I declare that the thesis entitled “Factors Affecting Profitability of Insurance Companies in Ethiopia: Panel Evidence” submitted to Research and Postgraduate Studies’ Office of Business and Economics College is original and it has not been submitted previously in part or full to any university or other funding organizations.

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Date: 14/05/2018

## **CERTIFICATE**

We certify that the thesis entitled “Factors Affecting Profitability of Insurance Companies in Ethiopia: Panel Evidence” was done by Mr. MengistuTegegn Kibret for the partial fulfillment of Master’s Degree under our Supervision.

**Leta Sera (PHD)**

(Main Advisor)

**Tesfaye Melaku (MSC)**

(Co-Advisor)

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## **ABSTRACT**

*This paper examined the effects of firm specific factors (age of company, size of company, leverage ratio, premium growth rate, liquidity ratio and tangibility of assets) on profitability proxy by ROA. Profitability is dependent variable while age of company, size of company, premium growth rate, leverage, liquidity ratio and tangibility of assets) are independent variables. The sample in this study includes nine of the listed insurance companies for twelve years (2005 to 2016). Secondary data obtained from the financial statements (Balance sheet and Profit/Loss account) of insurance companies, financial publications of NBE are analyzed. Panel data analyzed using Random Effect Model (REM) after testing the appropriateness of the model with Fixed Effect Model. From the regression results; size, premium growth rate and leverage and age are identified as most important determinant factors of profitability hence premium growth rate and size, are positively related. In contrast leverage and age negatively but significantly related with profitability. Lastly, liquidity and tangibility of asset are not significantly related with profitability.*

**Key words:** *Company, insurance, profitability.*

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## **LIST OF ABBREVIATIONS**

GLS: Generalized Least Square

Lev: Financial Leverage

NBE: National Bank of Ethiopia

EEA: Ethiopia Economic Association

OLS: Ordinary Least Square

ROA: Return on Asset

ROE: Return on Equity

ROIC: Return on Invested Capital

TAC: Tangibility of Assets

UAE: United Arab Emirates

UK: United Kingdom

US: United States of America

WACC: Weighted Average Cost of Capital

AGE: Age of company

SZC: size of company

LVC: Leverage of the company

PGR: Premium Growth Rate

LQC: Liquidity of the Company

# **CHAPTER ONE:**

## **INTRODUCTION**

### **1.1 Background of the Study**

The concept of insurance and particularly the “social insurance program” dealing with socio-economic problems has been around Ethiopia for a long time. Members of a community pooled together resources to create an Idir “social insurance fund”. The “premiums” ranged from material to moral support or other payments in kind. From the fund, “drawings were made out” to support the few unfortunate members exposed to perils.

Here more the insurance in its basic essence meant the social investments in which the families in the single village used to prepare drinks, and invite other families in the village, which could join hands on grass cultivations and diggings for that particular’s farm till the end, this process continued for the whole village and the ones who did not participate, were abandoned and could not get the assistance when the matter comes to them on grass farming. Insurance provides protection by compensating financial loss that arises from fortuities. The loss must be measurable in monetary value.

The insurer deals with thousands of insured party a premium in proportion to the degree of risk and the monetary value of the potential loss. Insurance is a risk transfer mechanism. The insurer deals with thousands of insured parties and thus spread the risks he has acquired by placing funds built up from thousands of premiums into a pool. Since it is unlikely that all insured parties will incur financial loss at the same time (or at all), the insurer will be able to draw money from the pool to compensate insured parties’ insurable risks (Malik 2011).

Insurance companies provide economic and social benefits in the society by indemnify losses prevention of losses, reduction in worry, fear and increasing employment.

Therefore, from above expression it can be inferred that, the current business world without financial institutions such as insurance companies are unsustainable because in one way, it is a normal practice that some economic units are in surplus while the others remain in deficit and in

the other way risky businesses have not a capacity to retain all types of risk in current extremely uncertain environment.

Insurance is a form of risk management, used to hedge against the risk of a contingent loss. It involves the transfer of the risk of potential loss from one entity to another, in exchange for a risk premium. Therefore, the insurance sector fosters financial stability by enabling economic agents to undertake various transactions with the facility of transfer and dispersion of risks. The role of insurance as a financial intermediary is particularly important in countries like Ethiopia with low levels of financial penetration and low contributes on GDP. Insurance companies play a large role in the service-based economy. Insurance companies provide unique financial services to the growth and development of every economy. In Ethiopia, the business of insurance plays significant intermediary roles in terms of risk transferring, enhancing private investment, increase of job opportunities and ensuring various development related projects. (Abate and Yuvaraj 2013).

Insurance enables businesses to operate in a cost-effective manner by providing risk transfer mechanisms whereby risks associated with business activities are assumed by third parties. It allows businesses to take on credit that otherwise would be unavailable from banks and other credit-providers fearful of losing their capital without such protection, and it provides protection against the business risks of expanding into unfamiliar territory – new locations, products or services—which is critical for encouraging risk taking and creating and ensuring economic growth (Ward and Zurbruegg, 2002).

The history of the modern development of commercial insurance in Ethiopia is closely related to the historical Emperor Menelik II and a representative of the British owned National Bank of Egypt to open a new bank in Ethiopia. For the last decade, the Ethiopian financial institutions in general and insurance companies in particular have shown the impressive progress in terms of number and service which not only creates the employment opportunities but also enhances the business activities in the Ethiopian economy.

The work of Hailu (2007) searches the historical routes, examines its emergence and indicates the track that the insurance industry in Ethiopia has gone through ever since it's' beginning in

early twentieth century. It is indicated that there has hardly ever been any work in insurance business in Ethiopia that went into the historical and factual aspects of the industry. The history of Insurance service is as far back as modern form of banking service in Ethiopia which was introduced in 1905. At the time, an agreement was reached between Emperor Menelik II and a representative of the British owned National Bank of Egypt to open a new bank in Ethiopia. Similarly, modern insurance service, which were introduced in Ethiopia by foreigners, mark out their origin as far back as 1905 when the bank of Abyssinia began to transact fire and marine insurance as an agent of a foreign insurance company. According to a survey made in 1954, there were nine insurance companies that were providing insurance service in the country. With the exception of Imperial Insurance Company that was established in 1951, all the remaining of the insurance companies were either branches or agents of foreign companies. In 1960, the number of insurance companies increased considerably and reached 33. At that time insurance business like any business undertaking was classified as trade and was administered by the provisions of the commercial code.

According to Hailu, (2007) the first significant event that the Ethiopian insurance market observation was the issuance of proclamation No. 281/1970 and this proclamation was issued to provide for the control & regulation of insurance business in Ethiopia. Consequently, it created an insurance council and an insurance controller's office, its strange impact in the sector. The controller of insurance licensed 15 domestic insurance companies, 36 agents, 7 brokers, 3 actuaries & 11 assessors in accordance with the provisions of the proclamation immediately in the year after the issuance of the law. Accordingly, as stated by the office mentioned above, the law required an insurer to be a domestic company whose share capital (fully subscribed) not to be less than Ethiopian Birr and in the case of a company transacting life insurance business, at least 30% of the paid-up capital must be held by Ethiopian nationals or national companies.

After four years that is after the enactment of the proclamation, the military government that came to power in 1974 put an end to all private enterprises.

Then all insurance companies operating were nationalized and from January 1, 1975 onwards the government took over the ownership and control of these companies & merged them into a single unit called Ethiopian Insurance Corporation. In the years following nationalization, Ethiopian Insurance Corporation became the sole operator.

After the change in the political environment in 1991, the proclamation for the licensing and supervision of insurance business heralded the beginning of a new era. Immediately after the enactment of the proclamation in the 1994, private insurance companies began to increase. Currently, there are 17 insurance companies in operation. Both public owned (1) and private (16) insurance companies which are operating as on December, 2016 throughout The country are listed in the following table 1.1

**Table 1.1 Lists of Insurance Companies Operating in Ethiopia as on 2016**

S/N	Name	Type	Establishment Year
1	Ethiopian Insurance Corporation	GENERAL	01/01/1975
2	National Insurance Company Of Ethiopia S.C	GENERAL	23/09/1994
3	Awash Insurance Company S.C	GENERAL	01/10/1994
4	Africa Insurance Company S.C	GENERAL	01/12/1994
5	Nyala Insurance Company S.C	GENERAL	06/01/1995
6	Nile Insurance Company S.C	GENERAL	11/04/1995
7	Global Insurance Company S.C	GENERAL	11/01/1997
8	The United Insurance S.C	GENERAL	01/04/1997
9	Nib Insurance Company S.C	GENERAL	11/04/2002
10	Lion Insurance Company S.C	GENERAL	01/07/2007
11	Ethio-Life And General Insurance S.C	GENERAL	23/10/2008
12	Oromia Insurance Company S.C	GENERAL	26/01/2009
13	Abay Insurance Company S.C	GENERAL	26/07/2010
14	Berhan Insurance Company S.C	GENERAL	24/05/2011
15	Tsehay Insurance S.C	GENERAL	28/03/2012
16	Lucy Insurance S.C	GENERAL	28/03/2012
17	Bunna Insurance S.C	GENERAL	21/05/2013

**Source: website and NBE Dec 1, 2016**

According to Abate (2012), the profitability of insurance companies can be affected by a number of factors such as age, size, leverage ratio, premium growth, capital growth, tangibility ratio,



liquidity ratio, and GDP growth and inflation rate. Some of these factors might have a positive impact on the insurers' profitability while others could have a negative effect. Furthermore, some of these factors that affect insurers' profitability could be under the control of the insurers' management (internal factors) whereas others might be out of its control (external factors). Understanding the internal and external factors that can have an impact on the profitability of insurers is essential not only for the insurance managers and supervisors but also for policy makers and regulators.

A number of factors, which can be classified as internal factors, factors of industry and macroeconomic factors, Inflation, Interest rate might affect the profitability of insurance companies. In most financial literature that addresses the topic of profitability of insurance companies, profitability studied in view of internal factors.

According to Naveed (2011), financial institution, Funds and transfers risks from one economic unit to another economic unit so as to facilitate trade and resources arrangement. The efficiency of financial intermediation and transfer of risk can affect economic growth while at the same time institutional insolvencies can result in systemic crises which have unfavorable consequences for the economy as a whole.

Hence, the important role those financial institutions such as insurance companies and Bank remain in financing and insuring economic activity and contribute to the consistency stability of the financial system. In particular and the stability of the economy of concerned country in short run and long run general is part of invulnerable and repair system of the economy.

According to Malik (2011) Profitability is one of the most important objectives of financial management since one goal of financial management is to maximize the shareholder's wealth. Profitability is very important determinant of financial performance. Therefore, insurance companies have importance both for businesses and individuals as they channel funds and indemnify the losses of other sectors in the economy and put them in the same positions as they were before the occurrence of the loss respectively.

In previous paper, 'Factors affecting the profitability of insurance companies in Ethiopia Teklit (2015), he concluded that insurance companies in Ethiopia should avoid high levels of liabilities, liquidity and fixed assets, because these factors were negatively correlated with their profitability. We also saw that company size and the volume of capital were positively correlated with profitability, but their impact was statistically insignificant. Premium Growth rate was positively correlated with profitability, as an increase on the amount of written premiums causes an increase on the profitability of insurance companies in our country.

The financial guarantee services that insurance companies provide are now being integrated into the wider financial industry. Non-life insurance companies (both private and public) provide fire, marine, accident, causality and many other forms of insurance. In order to track their financial performance, one crucial measure monitored is profitability of the institution.

The performance of the life insurance industry in Ethiopia seems to be poor yet the industry's importance of the insurance sector cannot be underrated. Insurance provides employment opportunities through its marketing and the distribution networks such as direct insurance companies, insurance brokers, insurance agents, insurance investigators, insurance surveyors, loss adjusters, loss assessors and risk managers.

Insurance sector continues on its inactive pace of growth and gradually increasing penetration of insurance services. The insurance industry has enjoyed full-bodied growth in the last few years, driven by favorable economic conditions, expansion of the financial sector as a whole, privatization of large state-owned entities and foreign investments. Institutional and political environments also play vital role besides firm specific factors of firm behavior.

For insurance companies to be sustainable in the competitive globalized environment, earning profit is a pre requisite. In the absence of profit, insurers can't attract outside capital so as to meet their objectives.

Performance of financial institutions can affect economic growth while at the same time institutional insolvencies can result in systemic crises which have unfavorable consequences for the economy as a whole. Therefore, it requires empirical investigation so as to sort out what are the important factors affecting profitability of insurance companies and this is help concerned

bodies to focus on the relevant factors. Hence the efficient performance of the institutions has become important and investigations by different researchers focus on what factors determine the performance especially the financial performance of the sector.

The variation between profits of insurance companies over the years, within a country, makes you think that domestic factors or firm-specific factors play a major role in determining profitability. Therefore, important to define what these internal factors are and what is the nature of their impact, in order to help insurance companies to take measures to increase their profitability. Therefore, the purpose of this paper is to clearly identify the key determinants of profitability of insurance companies in the country. It is important to emphasize the importance of financial institutions in the economy of a country and specially the importance of insurance companies in financing and insuring economic activity. Being aware of this fact, decided to further develop our study according factors affecting the profitability of insurance companies in Ethiopia. In this further research, we seek to assess the impact of the above mention internal factors on the profitability of insurance companies operating in our country. The methodology used to reach the objective of this paper, is using multiple regression analysis tool, with panel data.

## **1.2 Statement of the Problem**

Profitability is one of the most important objectives of financial management. Goal of financial management is to maximize the owner`s wealth and profitability which is very important determinants of performance. Measuring the performance of financial institutions has gained the relevance in the corporate finance literature because as intermediaries, these companies in the sector are not only providing the mechanism of saving money and transferring risk but also helps to channel funds in an appropriate way from surplus economic units to deficit economic units so as to support the investment activities in the economy.

The insurance industry has an important role to resistant and keeps an economic system to have a successful operation of the industry by setting energy for other industries and development of an economy. To do so the insurance industry is expected to be financially flush and strong through being profitable in operation. Hence, not only measuring the financial performance of insurance companies but also to have a clear insight about factors affecting financial performance in the

industry which, is the main problem to be investigated. Therefore, the determinants of insurance company's performance have attracted the interest of various academicians, practitioners and institutional supervisors (abate 2012).

The profitability of insurance companies in Ethiopia has been fluctuating over time since their establishment. In developing countries, only smaller group of studies examined financial performance of insurance companies this is because identifying the factors of financial performance help to avoid losses Malik, (2011). Moreover, as noted in NBE (2016) annual report total insurance company Ethiopia gained profit is less than compare one bank company gain profit and low contribution of the sector to Gross Domestic Product (GDP) despite the increasing contribution of the service sector to GDP is also another indicator of low performance of the sector. Hence there is a need for such studies in insurance sector in developing countries.

Some of internal factors that affecting profitability in insurance sector are age of company, leverage, size of company, Growth rate, volume of capital, and liquidity growth rate according to some studies Camelia (2011) and Hifza (2011). However, others scholars also arguing that there are external factors which affecting profitability like GDP, inflation and interest rate in a given country at a national (Riaz and Mehar, 2013) and Fadzlan and Chong 2008). Lee (2014) measured insurance company profitability by using operating ratio and return on assets (ROA) for the two kinds of profitability indicators to measure insurer's profitability while others also used the combination of ROA and ROE as indicator of profitability.

Hifza (2011), in her research article, had analyzed the various factors affecting profitability of insurance companies in Pakistan for the period 2004 to 2008 by selected a sample of 35 listed life and non-life insurance companies and specifically examined the effects of firm specific factors such as age of company, size of company, volume of capital, leverage ratio and loss ratio on profitability. The findings of the study showed that there was no relationship between profitability and age of the company but there was positive association between size of the company and profitability. The study also showed that the volume of capital was positively related with profitability whereas loss ratio and leverage ratio indicated negative relationship with profitability.

Amal (2012), in his research article, investigated various factors that affect financial performance of twenty-five Insurance Companies in Jordan during the period 2002 to 2007. The results showed that variables such as leverage ratio, liquidity, Size of company, and management competence have a positive statistical effect on the financial performance of insurance Companies. However, age of the company was found to have no influence on their performance that encourages new entrants into insurance industry. The researcher suggested that insurance companies should have high consideration of increasing assets and well qualified employees in the top managerial positions that leads to a better financial performance.

Abate and Yuvaraj (2013), in their research article, examined the effects of firm specific factors such as age of company, size of company, volume of capital, leverage ratio, liquidity ratio, growth and tangibility of assets on the performance of nine insurance companies in Ethiopia for the period of nine years i.e. from 2002 to 2010. The researcher revealed that variables such as growth, leverage, volume of capital, size, and liquidity were identified as most important determinant factors of profitability. However, age of the companies and tangibility of assets were not significantly related with profitability.

Hailu (2007) has found that the insurance industry is not growing in line with the growth of the Ethiopian economy. Bayeh (2011) revealed that the Ethiopian insurance industry is among the lowest in the world and African countries. The contribution of insurance sector in the country for gross domestic product is insignificant for several years. The range of insurance products offered is limited indicating that the sector is still at an early stage of development.

Various researchers from both developed and developing countries have showed an interest to do study on the profitability of banking sector rather than to investigate the financial performance of insurance industries. Hence, this results insufficient literatures availability in the study area. The financial performance of insurance companies is also relevant within the macroeconomic context since the insurance industry is one of the financial system' components, fostering economic growth and stability. Therefore, the determinants of insurance company's performance have attracted the interest of academicians, practitioners and institutional supervisors. Hence, these are important issues to be investigated for the insurance managers,

professionals, regulators and policy makers to support the sector in achieving the excellence so that required economic outcomes could be obtained from the help of the sector in Ethiopia by understanding the success and failure factors of profitability.

Though it is obvious that the financial sector in general and the insurance sector in particular has been recognized as an infant sector with negligible contribution to macroeconomic performance in Ethiopia, the underlying reason behind the low performance of the sector has not been well studied and hence there is a knowledge gap in the sector that this research is intending to fill. In Ethiopia factors affecting financial performance of insurance companies has not been adequately investigated which in turn motivated the researcher in finding out the determinants of insurance company's profitability. Therefore, to achieve the intended objective of the study, the paper has included premium growth rate and other related company specific variables as an explanatory variable which has been reviewed in this study.

Given plenty literatures in the area this study has assumed the profitability of insurance companies in Ethiopia is being affected by internal factors like: age of company, size of company, Premium growth rate, leverage ratio, liquidity ratio, and tangibility of assets, where the logic behind selecting these variables is discussed in detail in the literature part of this paper.

### **1.3 Objectives of the Study:**

#### **1.3.1 General Objective of the Study**

The main objective of the study is that to identify the major determinants of profitability of Ethiopian insurance companies for the period 2005 to 2016.

#### **1.3.2 Specific Objectives of the Study**

Based on the above general objective, the researcher tries to examine the following specific objectives:

- To measure the disparities of the insurance sector in Ethiopia based on their company specific variables.
- To examine the effect of company specific variables on the financial performance of Ethiopian insurance companies.

- To measure the extent and direction of the relation between the determinants and the insurance Companies' Profitability.
- To draw the policy implications on the insurance industry in Ethiopia

#### **1.4 scope of the Study**

The study covered all insurance companies registered and recognized by the NBE at Dec.2, 2016 and operating in Ethiopia. The method adopted consists of the survey of financial statements of individual insurance companies. With regard to the survey, the target population consists of 9 insurance companies. The number of total insurance companies under study is 9 and observation is also for 12 years and then 9 times 12, becomes 108 total observations included.

Even though there are other formal, semiformal and informal financial institutions, the study focus only on the determinants of profitability of insurance companies in Ethiopia. As the study tried to point out the scope of the study, the horizon of the study confined merely on the quantitative measure of determinates of insurance company's profitability (financial performance) in Ethiopia without any overall performance measurement tool

#### **1.5 Significance of the Study**

The main reason for this study is that the researchers have not paid enough attention to this subject in Ethiopia. Most of the studies previously focused on banks not on insurance companies as well as some focused on only analysis of financial performance not on factors affecting financial performance; therefore, this study is expected to provide empirical evidence on the profitability (financial performance) of insurance companies in Ethiopia.

Furthermore, many parties would benefit from the results that will emerge from the results of the study and these parties are: Management: Administration interested in identifying indicators of success and failure to take the necessary actions to improve the performance of the company and choose the right decisions.

## **1.6 Limitations of the Study**

During the study, the researcher faced some controllable (internal) variables that affected the smooth implementation of the research although the researcher tried his best to design the research as properly as possible. For instance; lack of resource and literatures are some of the factors that hindered the outcome of the research. Moreover, lack of relevant and up to date published literatures mainly in the context of Ethiopia and absence of full information displayed on websites were the major constraints during the study.

## **1.7 Organization of the Study**

The research paper organized in main five chapters. The first chapter comprises; Background of the study, statement of the problem, the research objective (general and the Specific research objective), scope, significance of the study, and limitation of the study. The second chapter contains the related literature review theoretically and empirically. The third chapter comprised, research methodology which includes; research design, data used in the research, sampling technique, Descriptive analysis, correlation analysis, Regression analysis, model specification variable selection and measurement independent variables their measurement. Chapter four incorporated; the research finding, the research analysis and interpretation of the result. Lastly chapter five deals with conclusion drawn and recommendation. The paper also incorporated acknowledgement, abstract, definition of terms, appendix, list of acronyms and reference.



## **CHAPTER TWO: REVIEW OF RELATED LITERATURE**

### **2.1 Theoretical Literatures**

The insurance industry constitutes one of the fundamental building blocks of the global financial system. The importance given to insurance has been increasing every day in both developed and developing countries. The basic reason for this is the contribution provided by the insurance industry on the economic growth process and on the level of national wealth. Financial institutions serve as the lifeblood of the economy by facilitating the flow of capital. Insurance firms, in particular, reinforce monetary and investment activities by providing long-term funds for physical and social infrastructure while simultaneously boosting risk-taking abilities. As the dominant segment in the insurance market, the sustainability of the insurance business is crucial for developing nations. (Öner [1] 2013).

According to Hailu (2007) the emergence of modern insurance in Ethiopia is traced back to the establishment of the Bank of Abyssinia in 1905. The first domestic private insurance company was established in 1951. In the 1960s domestic private companies started to increase in number. The military government took over control of the government from 1974 to 1991 and it put an end to all private enterprises.

Then all insurance companies operating were nationalized and merged them into a single unit called Ethiopian Insurance Corporation. After 1991, the proclamation for the licensing and supervision of insurance business signed. Immediately after the enactment of the proclamation in the 1994, private insurance companies began to increase (Mezgebe 2010). By the end of 2011, the Ethiopian insurance industry was composed of 14 insurance companies (13 private and 1 public), 43 insurance brokers, 915 sales agents, 1 insurance association. Eight of the existing private insurers were established during the first three years of liberalization (September 1994-January 1997). In the last ten years only five private insurers joined the industry with a total of branch networks of 47 Kassahun (2011). Currently, there are 17 insurance companies in operation of which one, the Ethiopian Insurance Corporation (EIC), is state-owned while the rest 16 are private (national bank of Ethiopia, 2016).

Firm's performance is the level of performance of a business over a specified period of time, expressed in terms of overall profits and losses during that time measurement is related to such potential determinants as company's size, loss ratio, investment ratio, capital structure, and the growth of written insurance premiums past performance (Malik 2011).

Amal (2012), distinguishes between two types of firm performance, financial or economic performance and innovative performance. Firm performance is very essential to management as it is an outcome which has been achieved by an individual or a group of individuals in an organization (Hansen and Mowen 2005). In analyzing insurance firms, it is often important to measure their performance relative to other firms in the industry. Traditionally, this has been done using conventional financial ratios such as the return on equity, return on assets, expense to premium ratios, etc. (David and Weiss, 1998).

The review of related literature is divided in to four sections; the first section deals with the concept of insurance and their profitability, the second section provides studies concerning profitability performance of insurance companies together with other financial institutions. The third section presents previous investigations on determinants of profitability in insurance companies. The last section summarizes empirical literature concerning factors affecting profitability in insurance companies.

### **2.1.1 The concept of insurance companies and their financial performance**

Renbao and wong (2004) stated in their investigation that "higher profits provide both the means (greater availability of finance from retained profits or from the capital market) and the incentive (a high rate of return) for new investment". Therefore, we can understand from the above explanation that insurance companies have double responsibility: in one way they are required to be profitable so as to have high rate of return for new investment. On the other hand, insurance companies need to be profitable in order to be solvent enough so as to make other industries in the economy as they were before even after risk occurred.

Profitability is one of the most important objectives of financial management because one goal of financial management is to maximize the owner's wealth and profitability which in turn indicates better financial performance.

According to Hifza (2011) insurance plays a crucial role in fostering commercial and infrastructural businesses. From the latter perspective, it promotes financial and social stability; mobilizes and channels savings; supports trade, commerce and entrepreneurial activity and improves the quality of the lives of individuals and the overall wellbeing in a country.

Michael (2011) in his investigation identified that insurance companies are playing the role of transferring risk channeling funds from one unit to the other (financial intermediation) such as general insurance companies and life insurance companies respectively. This implies that insurance companies are helping the economy of a country one way by transferring and sharing of risk which can create confidence over the occurrences of uncertain event and in another way insurance companies like other financial institutions plays the role of financial intermediation so as to channel financial resources from one to the other. Therefore, we can divide insurance companies in to two broad categories based on their role to the economy; the general insurance companies and life insurance companies.

For instance, Renbao (2004) summarized firm specific factors affecting property/liability which is general insurers and life/health insurance profitability separately that again provide valuable guidelines for insurers financial health. This is because life/health insurance companies are different from property/liability insurers in terms of operation, investment activities, vulnerability and duration of liabilities. Life insurers are said to function as financial intermediaries while general insurers function as risk takers (Renbao 2004)

Previous researches with regard to profitability mostly focused on financial institutions. Most of the researches conducted with regard to determinants of banks profitability could be classified in three, as country specific such as Amdemikael (2012), Tesfaye (2008), Simon (2016), Abate (2012) in Ethiopia, Uhomoibhi T (2008), Samy (2003), whereas others such as Sylwester (2011), Valentinai, Makau (2010), Calvin, and Liliana (2009) conducted their research at a cross country level.

In these investigations, determinants are classified as internal factors which are under the control of the management of banks and external factors those are beyond the control of the management. Therefore, it would be possible to presuppose that organizational performance has attracted scholarly attention in corporate finance literature. However, in the context of insurance sector, it has received a little attention Hafiz (2011). Hence it is reasonable to conduct research up on such area. Current study examines the impact of firm level characteristics (size, leverage, tangibility, risk, growth, liquidity and age) on performance of listed life insurance companies of Pakistan over seven years from 2001 to 2007.

### **2.1.2 The concept of profitability**

Financial Performance is any of many different mathematical measures to evaluate how well a company is using its resources to make a profit. Companies concentrated on the use of financial performance measures as the foundation of performance measurement and evaluation purposes (Majdy, Rafat, and Salah, 2011). According to Hamdan (2008) there are different ways to measure profitability such as: ROA, return on equity (ROE) and return on invested capital (ROIC). ROA is an indicator of how profitable a company is relative to its total assets. It gives us an idea as to how efficient management is in using its assets to generate earnings whereas ROE measures a company's profitability which reveals how much profit a company generates with the money shareholders have invested.

ROIC is a measure used to assess a company's efficiency in allocating the capital under its control in profitable investments. This measure gives a sense of how well a company is in using its money to generate returns. Comparing a company's ROIC with its weighted average cost of capital (WACC) reveals whether invested capital is used efficiently or not. In contrast, William and Dam (2004) argued that the performance of insurance companies in financial terms is normally expressed in net premium collected, profitability from underwriting activities, annual turnover, return on investment, and return on equity.

These measures could be classified as profit performance measures and investment performance measures. However, most researchers in the field of insurance and their profitability stated that the key indicator of a firm's profitability is ROA defined as the before tax profits divided by total

assets. Philip and Mike (1999), Hafiz (2011) are among others, who have suggested that although there are different ways to measure profitability it is better to use ROA. Return on assets emerges as the key ratio for the evaluation of profitability (Panayotis, Athanasoglou, and Delis 2008). It is one of the most widely used financial models for performance measurements that most literatures support as appropriate measure of financial performance (Ahmad, Zulfqar, and Naveed (2011), Renbao and Kie (2004), Liargovas and Skandalis (2008) and Malik (2011). Therefore, being profitable means that insurance companies are earning more revenues than being disbursed as expenses. As explained above just to analyze the drivers of profitability, it is useful to decompose either the return on asset ROA or ROE into their main components.

According to Swiss (2008) Profits are determined first by underwriting performance (losses and expenses, which are affected by product pricing, risk selection, claims management, and marketing and administrative expenses); and second, by investment performance, which is a function of asset allocation and asset management as well as asset leverage. The first division of the decomposition shows that an insurer's ROE is determined by earnings after taxes realized for each unit of net premiums (or profit margin) and by the amount of capital funds used to finance and secure the risk exposure of each premium unit (solvency). That is why most researchers use ROA as a measure of profitability in financial institutions.

The term profit can take either its economic meaning or accounting concept which shows the excess of income over expenditure viewed during a specified period of time. On one hand, profit is one of the main reasons for the continued existence of every business organization. On the other hand, profit is expected so as to meet the required return by owners and other outsiders. John (2009) clarified profitability ratio as a class of financial metrics that are used to assess a business's ability to generate earnings as compared to its expenses and other relevant costs incurred during a specific period of time.

Accordingly, the term 'profitability' is a relative measure where profit is expressed as a ratio, generally as a percentage. Profitability depicts the relationship of the absolute amount of profit with various other factors. Similarly, Michael (2011) argued that profitability is the most important and reliable indicator as it gives a broad indicator of the ability of an insurance company to raise its income level. In practice, executives define profits as the difference between

total earnings from all earning assets and total expenditure on managing entire asset-liabilities portfolio Kaur and Kapoor (2007).

The deviation of profit among insurance companies over the years in a given country would result to suggest that internal factors or firm specific factors play a crucial role in influencing their profitability. It is therefore imperative to identify what are these factors as it can help insurance companies to take action on what will increase their profitability and investors to forecast the profitability of insurance companies in Ethiopia. To do so, it is better to see what factors were considered in previous times by different individuals. The following points are some of the work of others among many others.

## **2. 2 EMPERICAL LITERATURE REVIEW**

### **2.2.1 Global insurance industry**

The insurance industry forms a vital part of the global financial market, with insurance companies being significant institutional investors. In recent decades, the insurance sector, like other financial services, has grown in economic importance. This growth can be attributed to a number of factors including, but not wholly: Rising income and demand for insurance, Rising insurance sector employment, and increasing financial intermediary services for policyholders, particularly in the pension business (Ward and Zurbruegg, 2002). Expanding on the link between GDP and insurance market development, it must be remembered that the insurance industry's primary function is to supply individuals and businesses with coverage against specified contingencies, by redistributing losses among the pool of policyholders. Insurance companies, therefore, engage in underwriting, managing, and financing risks.

The importance of insurance in modern economies is unquestioned and has been recognized for centuries. But insurance also serves a broad public interest far beyond its role in business affairs and its protection of a large part of the country's wealth. It is the essential means by which the disaster to an individual is shared by many, the disaster to a community shared by other communities; great catastrophes are thereby lessened, and, it may be, repaired. Insurance is an essential element in the operation of sophisticated national economies throughout the

world today. Without insurance coverage, the private commercial sector would be unable to function (Peter R. Haiss and Kjell Sumegi (2008).

Insurance enables businesses to operate in a cost-effective manner by providing risk transfer mechanisms whereby risks associated with business activities are assumed by third parties. It allows businesses to take on credit that otherwise would be unavailable from banks and other credit-providers fearful of losing their capital without such protection, and it provides protection against the business risks of expanding into unfamiliar territory – new locations, products or services – which is critical for encouraging risk taking and creating and ensuring economic growth (Ward and Zurbruegg, 2002). Beyond the commercial world, insurance is vital to individuals. Lack of insurance coverage would leave individuals and families without protection from the uncertainties of everyday life. Life, health, property and other insurance coverage's are essential to the financial stability, well-being and peace of mind of the average person. Insurance is a financial product that legally binds the insurance company to pay losses of the policyholder when a specific event occurs.

The insurer accepts the risk that the event will occur in exchange for a fee, the premium. The insurer, in turn, may pass on some of that risk to other insurers or reinsurers. Insurance makes possible ventures that would otherwise be prohibitively expensive if one party had to absorb all the risk. Advancements in medicine, product development, space exploration and technology all have become a reality because of insurance. Distribution of insurance is handled in a number of ways. The most common is through the use of insurance intermediaries. Insurance intermediaries serve as the critical link between insurance companies seeking to place insurance policies and consumers seeking to procure insurance coverage (Ward and Zurbruegg, 2002).

According to Hifza (2011) insurance plays a crucial role in fostering commercial and infrastructural businesses. From the latter perspective, it promotes financial and social stability; mobilizes and channels savings; supports trade, commerce and entrepreneurial activity and improves the quality of the lives of individuals and the overall wellbeing in a country.

### **2.2.2 Ethiopia insurance industry**

The insurance companies of Ethiopia perform a wide range of activities such as service designing, preparing contract and policy, marketing and selling, underwriting, rating, reinsurance and other services and claim settlement. The governments owned insurance companies Ethiopian Insurance Corporation they get all the government insurance business.

According to the rule, all insurance need in the government sector is done through these nationalized insurance companies, so it enjoys a monopoly. None of the private insurance companies are allowed to offer insurance services to government organizations. Furthermore, this corporation is also allowed to underwrite private businesses, and people feel confident about its reliability. So they have not yet felt any strong need to practice marketing properly, and usually they have reported annually profits over the years.

Michael (2011), in his investigation identified that insurance companies are playing the role of transferring risk channeling funds from one unit to the other (financial intermediation) such as general insurance companies and life insurance companies respectively. This implies that insurance companies are helping the economy of a country one way by transferring and sharing of risk which can create confidence over the occurrences of uncertain event and in another way insurance companies like other financial institutions plays the role of financial intermediation so as to channel financial resources from one to the other. Therefore, we can divide insurance companies in to two broad categories based on their role to the economy; the general insurance companies and life insurance companies.

For instance, Renbao (2004), summarized firm specific factors affecting property/liability which is general insurers and life/health insurance profitability separately that again provide valuable guidelines for insurers financial health. This is because life/health insurance companies are different from property/liability insurers in terms of operation, investment activities, vulnerability and duration of liabilities. Life insurers are said to function as financial intermediaries while general insurers function as risk takers.



Accordingly, Hifza (2011) in Pakistan, Sylwester (2011) in Poland, Hamadan (2008) in United Arab Emirates (UAE), Swiss (2008) in Egypt and Jay (2007) in United Kingdom conducted their research concerning determinants of profitability in property/liability or general insurance companies whereas Naveed, Zulfqar, Ahmad (2011), in Pakistan, and Zou (2008) in Canada, Desheng, Sandra and Lianga (2007), Wright (1992), and others conducted their study on determinants of life and health insurance companies.

The results of Ordinary Least Square (OLS) regression analysis indicate that size, risk and leverage are important determinants of performance of life insurance companies of Pakistan while ROA has a statistically insignificant relationship with growth, profitability, age and liquidity. Profitability in insurance companies could be affected by a number of determining factors. These factors, as explained above, could be further classified as internal, industry, and macroeconomic factors.

However, as will be discussed in the coming consecutive sections of the review, in most literatures, profitability with regard to insurance companies is usually expressed as a function of internal determinants. Rather, most studies concerning determinants of profitability in insurance companies are divided into two, such as determinants of profitability in general/property insurance companies and in life/health insurance companies.

Hence, most of the researchers and also my study focused on internal factors affecting profitability and most of the factors considered are age of company, asset size of company, leverage ratio, premium growth rate, tangibility of assets and liquidity ratio. Now let us see empirical evidences for each variable independently.

### **2.2.3 Internal Determinants**

The internal determinants of insurance companies' profitability are those management-controllable factors which account for the inter-firm differences in profitability, given the external environment. Accordingly, Hafiz (2011) defines internal determinants of profitability as factors that could be influenced by management decisions. As stated by Hamadin (2011) internal determinants can be broadly classified into two sub-categories namely financial statement

variables and non-financial statements variables. The financial statement variables are determining factors which are directly driven from items in a balance sheet and profit & loss accounts of the insurance companies. On the other hand, the non-financial statement variables are those factors which are not directly displayed on the financial statements accounts.

According to Yuqi (2007) financial institutions non-financial statements variables are classified as management quality, efficiency and productivity, age and number of branches. Most researches concerning insurance companies are conducted with respect to only financial statement variables. Hence, Hamadin (2008) in his dissertation regarding UAE used financial statement variables such as size, leverage, liquidity, tangibility of assets, volume of capital.

Similarly, Hafiz (2011) in Pakistan used such variables mentioned above and age as a non-financial statement variable. Sylwester (2011) in Poland, Hamadan (2008) in United Arab Emirates (UAE), Swiss (2008) in Egypt and Jay (2007) in United Kingdom, Naveed, Zulfqar, Ahmad (2011), in Pakistan, Adams and Zou (2008) in Canada, Deshen 17 V. and Lianga (2007), Wright (1992), Flaminiet. All (2009) in Sub-Saharan countries are among others used financial statement variables as independent variables. The following are the variables used in researches concerning profitability of insurance companies and related financial institutions and the details of internal financial statement and one non-financial statement variable are discussed in detail in this section.

### **2.2.3.1 Company Age**

In this study, age of the company represents the number of years during which the insurance companies have been operating in the Ethiopian insurance industry. It is expected that in connection with the increase in years of operations for the insurance companies that operate in the industry, both their experiences in relation to the Ethiopia insurance industry and their reputation in the industry will also increase. Newly established Insurance is not particularly profitable in their first years of operation, as they place greater emphasis on increasing their market share, rather than on improving profitability. Similarly, indicate that older Insurance expected to be more profitable due to their longer tradition and the fact that they could build up a good reputation. Obviously, the above studies those include age as one of their explanatory determinant indicates a positive relationship between age and profitability.

Several studies have been conducted to examine the effect of age on firm profitability. However, the empirical evidences of the linkage between profitability and firm age are somewhat inconsistent. For example, evidence collected by Philip Hardwick and Mike Adams (1999) from UK companies suggests that there is an inverse relation between profitability and firm age. After eight (8) years Jay (2007) found that there is a positive and significant relationship between the age of a company and its profitability as measured by ROA.

Similarly, the research conducted on the relationship among firm characteristics including size, age, location, industry group, profitability and growth by Swiss (2008) indicated that larger firms are found to grow faster than smaller and younger firms found to grow faster than older firms. In contrast, Hamadan (2008) found no significant statistical relation between age and profitability of insurance companies in UAE but there exist a positive and statistical significant relation between firm size and profitability.

Similarly, Hafiz (2011) in his Pakistan study found that there is significantly positive association between age & size of the company and profitability. The older the firm the more may be the profitability of the firm. This could be justified as experience and efficiency in the operation process may decrease cost of production and he found even that age is the strongest determinant of profitability. In most literatures the effect of size on banks profitability are represented by total asset. Flamini (2009) indicated that size is used to capture the fact that larger firms are better placed than smaller firms in harnessing economies of scale in transactions and enjoy a higher level of profits.

### **2.2.3.2 Company Size**

The company size can be expressed by many variables such as number of employees, number of branches, or total assets. Most researchers of the field use total assets to express the size of the company (Omondi and Muturi, 2013), (Burca and Batrinca, 2014); (Al-Shami, 2013); (Swiss 2008); (Çekrezi, 2015); (Malik, 2011).

The size of the company is considered as an influential factor because it shows that larger companies are better positioned in the market, operate with economies of scale, and thus enjoy higher benefits (Flamini, McDonald, and Schumacher, 2015). Most studies conclude that there is a statistically significant positive correlation between the size of the company and its profitability, expressed by ROA (Swiss, 2008), (Malik, 2011) and (Al-Shami, 2013).

However, there are discussions about the optimal size of the company, which positively affects profitability. A growth in assets that extends an optimal ratio may have negative effects, due to increased bureaucracy (Yuqi, 2007). Hence, the size-profitability relationship may be expected to be non-linear. Therefore most studies use the real assets in logarithm and their square in order to capture the possible non-linear relationship. Athanasoglou (2005) and Yuqi found positive relationship between size and profitability.

### **2.2.3.3 Liquidity Ratio**

This refers to the ability of an insurer to meet its short term obligations when it is due. It is commonly measured by the ratio of current assets to current liabilities. It also shows the ability of an insurer to convert its assets in to cash as quickly as possible. Liquidity for insurance companies shows the ability of insurers to pay current liabilities, which have the nature of operating expenses or payment of compensation in case of damage when due then shows us that more current assets are held and idle if the ratio becomes more which could be invested in profitable investments.

An insurer can use liquid assets in order to finance its activities and investments in times when there is less availability of external sources of funds. Low liquidity ratio indicates that an insurer is facing difficulties in meeting its short term obligations. On the other hand, an extremely high ratio of liquidity could also mean that the insurer is keeping idle cash that could have generated income by investing in profitable areas.

Accordingly, Renbao Chen and Kie (2004), cash flow (mainly premium and investment income) and liquidation of assets are the main sources of liquidity. Empirical evidences with regard to liquidity revealed almost inconsistent results.

Naveed. (2011) research article in his investigation in Pakistan found that ROA has statistically insignificant relationship with liquidity. Similarly, several other studies also have been conducted to measure the performance of the insurance companies. In contrast, Chen and Wong (2004) examined that, liquidity is the important determinants of financial health of insurance companies with a negative relationship. Similarly, Hakim and Neaime (2005) observed that liquidity, current capital and investment are the important determinants of banks profitability. Valentina, Calvin and Liliana (2009) in their investigation regarding Sub-Saharan countries found significant and negative relationship between bank profitability and liquidity.

#### **2.2.3.4 Leverage**

The leverage ratio of an insurance company is defined as the ratio of debt to equity. It indicates the amount of debt used to finance the assets of a given firm. An insurance company with significantly more debt than equity is considered to be highly leveraged. The risk of an insurer may increase when it increases its leverage. The trade of theory suggests a positive relationship between profitability and leverage ratio and justified by taxes, agency costs and bankruptcy costs push more profitable firms towards higher leverage. Hence more profitable firms should prefer debt financing to get benefit from tax shield. In contrast to this pecking order theory of capital structure is designed to minimize the inefficiencies in the firms' investment decisions.

Due to asymmetric information cost, firms prefer internal finance to external finance and, when outside financing is necessary, firms prefer debt to equity because of the lower information costs. The pecking order theory states that there is no optimal capital structure since debt ratio occurs as a result of cumulative external financing requirements. Literatures in capital structure confirm that a firm's value will increase up to optimum point as leverage increases and then declines if leverage is further increased beyond that optimum level.

For instance, Renbao and Rie (2004) stated that leverage beyond the optimum level could result in higher risk and low value of the firm. Empirical evidences with regard to leverage found to be statistically significant relationship but negative. For instance Renbao and Kie (2004), in Canada, Hamadan (2008) in UAE, Hifza (2011) in Pakistan, Sylwester (2011) in UK Swiss (2008) in

Egypt and Flamini (2009) in Sub-Saharan countries found that negative but statistically significant relationship between leverage and profitability of firms.

Harrington (2005) stated that the relationship between leverage and profitability has been studied extensively to support the theories of capital structure and argued also that insurance companies with lower leverage will generally report higher ROA, but lower ROE. Since an analysis for ROE pays no attention to the risk associated with high leverage.

### **2.2.3.5 Tangibility of Assets**

Tangibility of assets in insurance companies in most studies is measured by the ratio of fixed assets to total assets. A recent study by Naveed ,Zulfqar and ahmad(2011) investigates the impact of firm level characteristics on performance of the life insurance sector of Pakistan over the period of seven years. For this purpose, age, risk, growth and tangibility are selected as explanatory variables while ROA is taken as dependent variable. The results of OLS regression analysis revealed that leverage, size and risk are most important determinant of performance of life insurance sector whereas ROA has statistically more of insignificant relationship with, tangibility of assets. However, Hafiz (2011) found that there exists a positive and significant relationship between tangibility of assets and profitability of insurance companies and argued that the highest the level of fixed assets formation, the older and larger the insurance company. In contrast to this, Yuqi (2007) in UK found no significant relationship between tangibility of assets and profitability of insurance companies.

### **2.2.3.6 Premium Growth Rate**

Premium growth rate is calculated using the following equation:

$$\text{Premium Growth Rate} = \frac{GWP_t - GWP_{t-1}}{GWP_{t-1}}$$

Where: GWP is the gross written premium and

$t$  is the index of time periods (years).

The main source of income earned by insurance companies resulting from insurance activities is the gross written premiums. The increase in premium growth rate will ensure the growth of the company and increase of its market share. On the other hand, excessive or poorly coordinated

growth of premium volume causes or aggravates other risks that may endanger the company's existence (Janotta-Simons).

Insurance companies is have weak financial positions if underwriting is excessive, if risk selection or pricing is not done carefully, and if financial resources are insufficient to cover risk (Leflaive). Kim, found that rapid growth of premium volume is one of the causal factors in insolvency. Therefore, being excessively obsessive about the increase in the volume of the gross written premiums especially in an economic downturn may lead to the negligence of other important targets and self-destruction (Chen and Wong). Consequently, it is expected that the increase in premium growth rate will increase the profitability of insurance companies together with a strong financial structure, suitable reinsurance policies, and a low loss ratio.

Empirical results show that rapid growth of premium volume is one of the causal factors in insurers' insolvency (Kim 1995). Being too passionate with growth can lead to self-destruction as other important objectives might be neglected. This is especially true during an economic downturn, such as the Asian Financial Crisis. Insurance companies having more and more assets over the years have also better chance of being profitable for the reason that they do have internal capacity though it depends on their ability to exploit external opportunities. Empirical evidence by Ahmed (2011) in Pakistan, Li (2007) in UK and Al-Shami (2008) in UAE of their investigation found a positive and statistically significant relationship between premium growth and profitability of insurance companies. And also Yuqi (2007) in UK and Hamadin (2008) in UAE of their investigation found a positive and statistically significant relationship between growth and profitability of insurance companies. Growth in written premium has significant impact on insurance company's profitability.

A rise in growth rate is regarded as an indication of a firm's financial strength and may cause higher demands for raising equity funds from external sources. Insurance company collects premiums from policy holders, invests the money (usually in low risk investments), and then reimburses this money once the person passes away or the policy matures therefore increase in premium brings more investment opportunity of insurance companies.

# **CHAPTER THREE:**

## **RESEARCH METHODOLOGY**

### **3.1 Data type and Data Sources**

The study focus on secondary data, which are obtained from annual reports of individual insurance companies and NBE. And this is because the advantage of using secondary data includes the higher quality data compared with primary data collected by researchers themselves Stewart and Kamins, (1993) as cited by Yuqi (2007); the feasibility to conduct panel evidence, which is the case in this study; and the permanence of data, which means secondary data generally provide a source of data that is both permanent and available in a form that be checked relatively easily by others, i.e. more open to public scrutiny.

Therefore, enhance the reliability of the data. The principal secondary data sources for this paper are individual insurance company's annual reports that contain detailed consolidated balance sheets and income statements and National Bank of Ethiopia, which can provide comprehensive database for all insurance companies. The data collect and analyzed is a balanced panel of nine insurance companies in Ethiopia operating over the last 12 years. Panel data is selected by the study in order to meet the research objectives as it best fits better than the single time series or cross-sectional alone.

That is why Chris (2008) in his book clearly presents the advantage of using panel data in the following way. First, and perhaps most importantly, we can address a broader range of issues and tackle more complex problems with panel data than would be possible with pure time-series or pure cross-sectional data alone.

Second, it is often of interest to examine how variables, or the relationships between them, change dynamically (over time). To do this using pure time-series data would often require a long run of data simply to get a sufficient number of observations to be able to conduct any meaningful hypothesis tests. But by combining cross-sectional and time series data, one can increase the number of degrees of freedom, and thus the power of the test, by employing information on the dynamic behavior of a large number of entities at the same time.



The additional variation introduced by combining the data in this way can also help to mitigate problems of multi-co linearity that may arise if time series are modeled individually. Third, structuring the model in an appropriate way, we can remove the impact of certain forms of omitted variables bias in regression results.

Panel data analysis is an increasingly popular form of longitudinal data analysis among social and behavioral science researchers Yuqi (2007). Panel data analysis is a method of studying a particular subject within multiple sites, periodically observed over a defined time frame. With repeated observations of enough cross-sections, panel analysis permits the researcher to study the dynamics of change with short time series. Therefore, the combination of time series with Cross-sections can enhance the quality and quantity of data in ways that would be impossible using only one of these two dimensions.

### **3.2 Research Approach**

In terms of investigative study there are two common approaches to business and social research: one is deductive approach that develops theories and hypotheses followed by a research strategy to test the hypotheses; and second inductive approach that finds data and develops theories as a result of the data analysis Saunders (2003) as cited by Yuqi (2007).

The deductive approach introduces a high level of objectiveness in research through external observation in so far as the choice of questions and subsequent phrasings are not subjective. In contrast, the inductive approach provides a high level of subjective and a number of theoretical possibilities based on the context of the individual research situation Yuqi (2007).

This study examines the previous findings in the literature, and applies the model in Ethiopian insurance companies. Because of these, a deductive approach is adopted by constructing an empirical model and hypothesizing its collinear relationship between determinants and its dependent variable: profitability of insurance companies in Ethiopia.

### **3.3 Research Method**

The study adopted quantitative research design. This approach involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion (Kothari, 2004). Quantitative research involves studies that make use of statistical analyses to obtain their findings (Geoffrey and David, 2005). The method consisted of the analysis of financial statements of individual insurance companies. The methodology of carrying out this research is based on the objectives of the paper and the availability of relevant information. In achieving the objectives and obtaining answers for research questions, the study is adopted quantitative method research approach, the paper is primarily base on quantitative research, which constructed an econometric model to identify and measure the determinants of profitability. Specifically, multiple regression analysis is adopted to measure the effect of determinants on profitability.

The use of multiple regressions considers the simultaneous relationships amongst the multiple numbers of independent and dependent variables found across the regression model, therefore suited to the nature of the study. The significance of the impact of the independent variables on dependent variables is, at the same time, highlighted in using multiple regressions. Multiple regressions are further utilized to examine the associative relationships between variables in terms of the relative importance of the independent variables and predicted values of the dependent variables.

### **3.4 Sampling Mechanism**

The study population consisted of 17 insurance companies currently operating in Ethiopia. Out of this total population, the researcher took nine insurance companies as a study sample by using Purposive sampling is used. The researcher is obligated to adopt this sampling method due to the insufficiency of data for some of the companies because of their late establishment. The primary consideration in such a sampling procedure is the judgment of the researcher as to who can provide the best information and data sources available to achieve the objectives of the study. Such a sampling technique is very useful for establishing historical reality, describing a phenomenon or developing something about which much is not known.

From 17 insurance companies established and serving with in the specified period of time from June 2005 to June 2016 and the size for sample are nine insurance companies operating over the period of 12 years. The missing 8 insurance companies are resent established .Twelve years is assumed to be relevant because five years and above is the recommended length of data to use in most finance literatures.

### 3.5 Econometric Model Specification

The literature generally, in so far as it is discuss, comes to the conclusion that the appropriate functional form for testing is a linear function although there are dissenting. The Swiss Re (2008) specification test was also applied with results that supported the use of the linear function. The regression model is used to identify the relationship between the profitability of insurance companies and age of company, leverage ratio, company size, premium growth rate, Liquidity and tangibility of asset.

Data analyze are with one dependent variable (profitability) and six independent variables (age of companies, size of companies, premium growth rate, leverage ratio, tangibility of assets, and liquidity, and previous profitability). The generally accepted way of choosing between fixed and random effects is running a Hausman test.

Random effects is give better P-values as they are a more efficient estimator, so random effects regression should be adopted if it is statistically justifiable to do so. The Hausman test checks a more efficient model against a less efficient but consistent model to make sure that the more efficient model also gives consistent results. It tests the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effect estimator.

For estimation purposes, the study is use following panel data modeling:

$$ROA_{i,t} = \alpha + \sum \beta_j X_{i,t}^j + v_i \dots\dots\dots (1)$$

Where,  $ROA_{i,t}$  is the return on assets of insurance i for period t;

$\alpha$  is the regression constant;

$X_{i,t}^j$  denote insurance specific determinants;

$v_{i,t} = \varepsilon_{i,t}$  is the disturbance term. By using the model and comparing the co-efficiency of each explanatory variable, it is generate the finding that which factor is more significant in relation to insurance companies “ profitability” and the finding is correspond to the evidence in the literature.

### **3.6 Method of Analysis**

The collected data for the research can be analyzed through various analysis techniques. Previous literatures (Malik, Ahmad, and Amal 2011, Abate, 2012) shows descriptive analysis; correlation analysis and regression analysis can be applied to studies with panel data evidence to investigate factors affect financial performance of insurance companies. Hence, in this study, these analyses were performed using STATA version 13.0.

The regression results and were also employed to test the study hypotheses. It means that this section provides the descriptive analysis of the panel data and variables for the study in collaboration with some important test such as normality of data, discusses the correlation analysis between dependent and independent variables, deals the results of the linear regression and data analysis that constitute the main findings of this study.

#### **3.6.1. Descriptive Analysis**

The descriptive statistics explores and presents an overview of all variables used in the analysis. In this section the mean, minimum, maximum, standard deviations of the variables are produced for the variables under study for the period 2005 to 2016.

#### **3.6.2 The Correlation Analysis**

Correlation analysis measures the strength or degree of linear association each variables. It is a measure of linear association or linear dependence only; it has no meaning for describing nonlinear relations. It does not necessarily imply any cause-and-effect relationship (Guajarati 2004). The results of this analysis represent the nature, direction and significance of the correlation of the variables considered under this study.

### **3.6.3. Regression Analysis**

The regression analysis is used to examine the relationship between the profitability of Ethiopian insurance companies and explanatory variables such as age, size, leverage, liquidity Ratio, premium growth rate, and previous year profitability of the companies. The result of a regression analysis is an equation that represents the best prediction of a dependent variable from several other independent variables. In terms of regression analysis, as panel data is adopted in this study, corresponded regression model is selected from fixed effect and random effect regression.

Fixed effects regression is the model to use when researcher want to control for omitted variables that differ between cases but are constant over time. It allows using the changes in the variables over time to estimate the effects of the independent variables on dependent variable.

Otherwise random effect estimation model is used and it is the models to use when researchers want to control for omitted variables that change over time but are constant between cases. It allows using the variation between cases to estimate the effect of the omitted independent variables on dependent variable.

### **3.7 Variable Selection and Measurement**

This paper is attempted to examine the main determinants of profits of insurance company's measurement of profitability.

According to Hamadan (2008), three important measures of firm's performance are: profitability, size and survivorship. Profitability indicates the firm's ability to achievement of the rate of return on a company's assets and investment funds. With regard to size, it is revealed in his work as a firm's ability to expand its size could be a reflection of its success as earnings are reinvested and external funding could be easily found. Whereas survivorship indicates the ability to earn sustainable development concerning competitive advantages beyond initial opportunities like an economic upturn or the early growth stage of an industry.

This research is concern only on profitability of insurance companies in Ethiopia as a financial performance and the internal factors that determine profitability. Hence, eight characteristics are used as internal determinants of performance. Referring to previous studies, the use of ratio in measuring leverage, liquidity, tangibility and profitability performance is common in the literature of accounting and finance practices.

In line with earlier studies that examined the determinants of insurance companies' profitability, accounting ratios are used as measurement of individual variables. In specific, the dependent variable, profitability of insurance companies, is measured by ROA. In order to select the determinants as explanatory variables in the model, previous studies have also been reviewed and literature suggests that the following factors exert strong impact on insurance company's profitability as internal determinants; therefore, they are adopted in the constructed model. And following is the details of variables selected.

### **Profitability**

There are many different ways to measure profitability, as shown in previous studies. In this study net income before tax to total assets (ROA) is used to measure profitability, because most of the studies regarding the subject used this ratio to determine the profitability of insurance companies.

### **Age of company**

This variable is measured by the number of years from the date of 2005- 2016 for 12 consecutive years.

### **Company size**

In different studies, different researchers use different measurements of company size such as number of employees and total assets of a company. However, most of the researchers use the log value of total assets as a measure of size in such area. Therefore, company size is measure by total assets in log value.

## Leverage

The amount of debt used to finance a company's assets. A company with significantly more debt than equity may consider to be highly leveraged. This variable is measured by total debt to total equity value of the company.

## Premium Growth Rate

The main source of income earned by insurance companies resulting from insurance activities is the gross written premiums. The increase in premium growth rate is ensuring the growth of the company and increase of its market share.

## Liquidity

Liquidity from the context of insurance companies is the probability of an insurer to pay liabilities which include operating expenses and payments for losses/benefits under insurance policies, when due and therefore, measured by total current assets to total current liabilities.

To capture the tendency of profits to be persistent over time (due to market structure imperfections or high sensitivity to auto-correlated financial factors), the researcher is tried to adopt a dynamic specification of the model, with a lagged dependent variable among the regressor. Chervis (2008), in his book for introductory econometrics for finance argued that lagged values of variables may capture important dynamic structure in the dependent variable that might be caused by a number of factors such as inertia of the dependent variable and overreactions. This yields the following model specification:

$$ROA_{i,t} = \alpha + \gamma ROA_{i,t-1} + \sum \beta^j + v_i \text{-----}(2)$$

Where  $ROA_{i,t-1}$  is the one period lagged profitability and  $\gamma$  measures the speed of mean reversion. A value of delta between 0 and 1 indicates that profits are persistent, but they are eventually returned to the equilibrium level.

Specifically, values close to zero denote a high speed of adjustment and imply relatively competitive market structure, while a value closer to 1 implies slower mean reversion, and therefore, less competitive markets.

Taking all these explanatory variables into consideration, the extended equation to reflect the variables is formulated as follows:

$$ROA_{i,t} = \alpha + \gamma ROA_{i,t-1} + \beta_0 AGC_{i,t} + \beta_1 LNSZC_{i,t} + \beta_2 LVC_{i,t} + \beta_3 PGC_{i,t} + \beta_4 TAC_{i,t} + \beta_5 LQC_{i,t} + \varepsilon_{i,t} \dots\dots\dots(3)$$

Where:

Table 3.1 Variable Formula

<b>A</b>	is constant
$\beta_0, 1, 2, 3, \dots, 5$	coefficient of independent variables parameters to be estimated
$ROA_{i,t}$	Return on Assets (ROA)= Net Income before Taxes / Total Assets
$SZC_{i,t}$	Size=total assets in log value
$TAC_{i,t}$	Tangibility = (Fixed assets / total assets)
$LQC_{i,t}$	Liquidity = (Current Assets / Current Liabilities).
$PGC_{i,t}$	Premium growth rate = the percentage increase in gross written premiums $(GWP(t) - GWP(t-1))/GWP(t-1)$
$AGC_{i,t}$	Age = (The difference between the current year (2016) and the year of establishment of the company).
$LVC_{i,t}$	Leverage = (total debt / total equity).
$\varepsilon_{i,t}$	The error term.
Note: Formulas are collected from the previous studies.	

**Source: own computation and previous different literatures**

1.  $ROA_{i,t}$  is the profitability in insurance company  $i$  at time  $t$  (dependent variable) in this study return on assets (The return on assets (ROA) defined as the insurance companies before tax profit over total assets) is used to measure profitability. My justification is that ROA as the key proxy for insurance companies “profitability”, instead of the alternative return on equity (ROE), because an analysis of ROE disregards financial leverage and the risks associated with it as a measure of profitability in insurance companies. Since profits are a flow variable generated over the years, as opposed to the stock of total assets, I measure this ratio as a running year average, with the average value of assets of consecutive years as a denominator.



2.  $\alpha$  is constant,
3.  $ROA_{i,t-1}$ : the profitability of insurance company in the previous times t
4. Age: the variable age of company is be measured from the number of years to date of establishments (difference between observation year and establishment year) or in other words the age of each insurance company at time t
5. Size: company size is be measured by total assets in log value,
6. Lev: is leverage ratio and for this variable the proxy is the ratio of total debt to equity value of the company that means total debts divided by total equity
7. TA: Tangibility (Fixed assets divided by total assets)
8. LQ: Liquidity (Current assets divided by current liabilities)
9. PGR: Premium collected from sales policy insurance coverage.
10.  $\beta_0 \dots \beta_5$ : coefficient of independent variables
12.  $\epsilon$  is error term.
12. i is insurance companies 1 to 9

Based on review of relevant and related literatures, it is hypothesized that volume of capital, growth, age and size of company, leverage ratio, premium growth rate, liquidity ratio and previous profitability is expect to influence firm profitability as measured by ROA.

**Accordingly, the following hypothesis is test by the study:**

**H1:** There is positive relationship between age and profitability of insurance companies in Ethiopia.

**H2:** There is positive relationship between size and profitability of insurance companies.

**H3:** There is negative relationship between leverage and profitability for Ethiopian insurance companies.

**H4:** There is positive relationship between premium growth rate and profitability of Insurance companies in Ethiopia.

**H5:** Tangibility of assets of insurance companies and their profitability are negatively related.

**H6:** Liquidity ratio and profitability of insurance companies are positively related.

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# **CHAPTER FOUR:**

## **ANALYSIS AND FINDINGS**

### **4.1 Introduction**

This section presents the estimation results and its associated diagnostic tests based on the panel dataset from nine insurance companies in Ethiopia during the period of 2005 to 2016. The model assumes Return on asset as dependent variable whereas different company specific factors such as age and size of the companies, premium growth rate, leverage ratio, tangibility of company assets and liquidity ratio are treated as explanatory variables where the selection of these variables basis both theoretical and empirical justification.

Sambasivam and Abate (2013) among others indicated the Profitability in insurance industries could be affected by factors related to the internal company specific factors as well as external or exogenous factors where the external factors can further be macroeconomic or factors related to the performance of world financial markets. Nonetheless, most previously conducted literatures in the area, used only the internal (company specific) factors as the determinants of the profitability of insurance companies (Wasike 2016), (Kaya, 2015) and (Malik, 2011). This is partly due to the fact that most external factors have poor explanatory power to determine the profitability of the company and partly due to the non-conformability of the national level variables because of the panel nature of the data under consideration.

The chapter is broadly divided into three subsections. The first section presents descriptive statistics and their corresponding interpretation. The second section Correlation analysis on the other hand provides different diagnostic checks on the conformability of the data at hand for further estimation and inferences. Such tests include the normality, autocorrelation and Heteroscedasticity tests. Finally the Regression analysis deals with the econometric models and the hypothesis tests, where the main findings of the study, is discussed in detail.

### **4.2. Descriptive analysis**

This section concerns with the overall summary of all the Variables involved in the model aimed to understand their distinct behavior independently through computing their mean value, standard deviation and related statistics whereas the joint behavior of each variable with the rest

of the others are also assessed using correlation analysis. This part of the analysis aimed in providing supportive evidences for the econometric model as well as simultaneously checks if there exist unusual values such as out layer in the data.

#### 4.2.1. Descriptive statistics

This part discusses the implication of the descriptive statistics as reported in the table below. The mean values, standard deviation, the minimum values and the maximum values for each variable under consideration is computed aimed to measure the extent of the deviations (disparities) of the insurance companies under investigation, in terms of their company specific variables.

Table 4.1: Descriptive statistics

Variable	Mean	Std. Deviation	Min	Max
ROA	0.080	0.055	-0.05	0.40
AGC	2.11	0.873	1.47	7.72
LVC	0.67	0.086	0.45	0.84
SZC	8.379	0.447	7.36	9.45
LQC	0.981	0.259	0.26	2.31
PGC	7.800	23.43	-0.14	221
TAC	0.183	0.109	0.04	0.54

*Source: Own computation and STATA reg. (2018)*

Based on the table above (table 4.1) the average values of all the variables involved in the model are limited within the range of 8 to 0.08. The maximum mean value is registered by size of the company where as the minimum value belongs to the dependent variable (ROA). The profitability of the companies (ROA) on average is estimated to be around 8 for Ethiopian insurance companies during the study period with the standard deviation of 0.055 implying that the variability of the profit is relatively low in the sector. The minimum variability is the most important aspect not only in insurance companies but also in any business so as to be able to predict its future prospects.

The average value of leverage as measured by the ratio of debt to equity is estimated to be 0.67

with the variability of 0.08 standard deviation indicating that the sample companies are at relatively similar position/moderate in terms of their leverage.

The average value of age is 2.11 years along with the standard deviation of 0.87 years indicating that there is a moderate variation of companies in terms of their year of establishment where their age may be associated with their ability to reap economies of scale in the sector. Relative similarity of age may be viewed in terms of the absence of a monopoly power in the sector, at least due to the accumulated experiences and associated reduction in the cost of service delivery in the sector.

The mean value of the size of the company, on the other hand, is about 8.39 ranging from 7.36 to 9.45. Given this information, it can be concluded that the sample insurance companies are relatively similar in terms of their size as the 0.44 standard deviation also strengthens this argument. Similarly the mean value of liquidity ratio and premium growth respectively are 0.98 and 7.8 with their respective standard deviation of 0.26 and 23.4 respectively where the variability as measured by standard deviation for premium growth is exceptionally large ranging from the minimum value of -0.14 to 221. This might imply that there is a significant difference among insurance companies in Ethiopia in terms of their premium growth. Liquidity ratio that the sample insurance companies are relatively similar.

In terms of tangibility, on the other hand, insurance companies in Ethiopia are relatively in a similar position as the mean value is 0.18 with the associated variability of only 0.10. Its value ranges from the minimum of 0.14 to 0.5. As additional indicated in appendix 1; profitability measured by ROA for different insurance companies considered for this study for twelve consecutive years is different. Identification of the internal factors that affect the profitability of these companies is the task of the researcher for this study.

### **4.3 Correlation analysis**

The correlation among the variables included into the model is computed in order to give a supportive evidence for the relationship of different variables assumed as explanatory variables that are expected to influence the profitability of a firm. The reported statistics disregard the cause-effect relationship among the variables by simply measuring the association (co-

movement) of the variables. Accordingly Appendix 3, the negative sign implies that the three variables under consideration move to the opposite direction and vice versa.

Table 4.2. Correlation among the variables

Variable	ROA	AGC	LVC	SZC	LQC	PGC	TAC
ROA	1						
AGC	-0.042	1					
LVC	-0.074	-0.150	1				
SZC	0.259	0.057	0.504	1			
LQC	0.263	0.079	-0.323	-0.050	1		
PGC	0.510	-0.075	0.027	0.025	0.126	1	
TAC	-0.222	0.195	-0.388	-0.324	-0.373	0.188	1

*Source: Own computation and STATA reg. (2018)*

Given the whole dataset into consideration, there exists a negative correlation between profitability of a company and its age. In a literal sense, this relation is against the common sense as profitability is expected to increase with age, because of the fact that companies are expected to prepare themselves in the long run, for more competition engaging into research and development so as to be competent as well as the degree of competitiveness is expected to increase with increase in age as economies of scale will improve in the long run. On the other hand, leverage and companies profitability move to the opposite direction as expected. Whereas, company's tangibility as measured by fixed asset per unit of total asset is negatively correlated with the profitability.

Other variables such as size of the company, liquidity and premium growth have a positive association with profitability with slightly different degree of association. Premium growth (PGC) has relatively strong positive association (0.51) followed by liquidity and size of a company respectively.

The negative correlation that is existed between age and profitability as well as leverage and profitability is in line with the findings by Hifza (2011), on the insurance in Pakistan, Andres and Jay (2017) evidence from Philippines on life insurance, according to this finding, age and

leverage ratio of the company is negatively correlated with the profitability of the company where as other variables such as size, liquidity and premium growth are positively associated with profitability of the company.

### 4.3.1 Diagnostic test

Table 4.3 unit-root test

Variable	Harris-Tzavali Unit-root Test		Breitung unit-root test	
	Statistics	P-value	Statistics	P-value
ROA	0.135	0.00	-1.86	0.43
AGC	0.044	0.00	1.35	0.09
LVC	0.570	0.00	-2.37	0.00
SZC	0.834	0.75	3.69	0.06
LQC	0.21	0.00	-1.36	0.08
PGC	0.456	0.00	2.12	0.15
TAC	0.726	0.02	-1.252	0.07

*Source: Own computation and STATA reg. (2018)*

As it is common in time series econometrics that the existence of unit root problem leads to spurious regression and which obviously applies for panel data because of the time dimension in the panel data framework. The unit root problem is particularly the concern in data obtained at different point in time (Culver 1997). And hence, this section detects the presence of a unit root problems by adopting two commonly used tests (Harris Tzavali and Breitung unit root tests) as reported in Table 4.3. The first tests assume common autoregressive parameters and include panel mean as well as time trends whereas the second test assumes both time and space components to be asymptotically infinity.

The unit root test consists of testing the null hypothesis which claims the existence of non-stationarity which is the panel data equivalent of ADF (augmented Dickey-Fuller) test. The t-ratio is distributed normally under the null hypothesis of a unit root. (Breitung and Meyer 1994). Both test statistics claim the existence of unit root (non-stationarity) problem in the

panel under the null against the alternative hypothesis claiming the Panels data under consideration are stationary.

Based on the Harris-Tzavalis test, except the size of the company (SZC) all variables are Stationary at least at 10 percent level of significance. As it can be viewed from the table above, all variables are stationary at least based on one of the two test statistics and hence, it can be generalized that a unit root problem is not a series problem in the model. The researcher has made the decision rule such that the absence of unit root problem (stationarity of the data) is supported by at least one of the two tests. The corrective measures such as differencing the dataset or detrending would have been applied if the unit root problem had existed while at the expense of inferences for the long run relationship among variables under consideration.

**Table 4. 4. Diagnostic test statistics**

Mean VIF	1.53	
Breusch Paga heteroscedasticity test	Chi2	0.84
	Pro.Chi2	0.36
<b>Information matrix (IM) test</b>	<b>Chi2</b>	<b>Prob.</b>
Heteroscedasticity	9.00	0.99
Skewness	2.48	0.87
Kurtosis	1.07	0.30
Multivariate Normality test	Prob(skewness)	Prob(kurtosis)
	0.00	0.00
<b>Doornik-Hansen Normality test</b>	<b>Chi2</b>	<b>Prob(Chi2)</b>
	102.32	0.00

*Source: Own computation and STATA reg. (2018)*

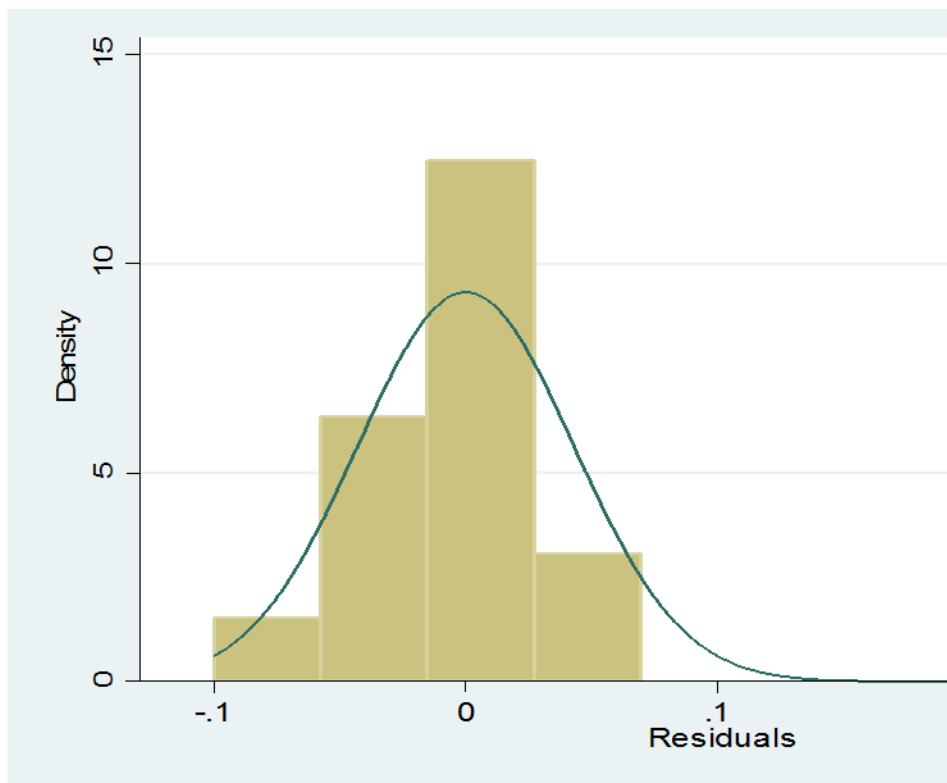
Before the application of econometric estimation, different diagnostic checks has been made on the data at hand, so as to make sure that the data is conformable for any further analysis. According to the test statistics reported in the table above the existence of Multi-collinearty



among the explanatory variables is checked using the variance inflating factor (VIF) test, and the mean value of the (VIF=1.53) confirms the absence of any Multi-collinearity problem in the dataset.

The problem of heteroscedasticity is also checked using two alternative tests, Breusch Pagan heteroscedasticity test and Cameron and Trivedi's decomposition of information matrix test. Both tests claim the presence of homoscedasticity under the null and given the probability of Chi2 reported in the table above (0.36 and 0.99 for the two tests respectively), the null hypothesis can't be rejected implying that there is no heteroscedasticity problem in the model.

Figure 4.1: Histogram Normality data



Similarly, the normality test is conducted using different test methods such as skewness and kurtosis as well as Doornik-Hansen normality test, where the null hypothesis of the first tests claim that the classical assumptions are not violated. Whereas Doornik-Hansen normality test provides the probability of skewness, and kurtosis where both are reported as zero, implying the absence of skewness and kurtosis and proving the normality assumption.

#### 4.4. Regression analysis

Aimed to test the hypothesis established earlier, the researcher has employed a regression analysis using the model compatible for panel data (fixed effect model and random effect model). Fixed effect and random effect models may be the popularly used models with panel data. As to which model to employ, Hausman test is used. In running a Hausman test the null hypothesis claims the preferred model is random effects against the alternative, the fixed effects.

It basically tests whether the unique errors ( $\varepsilon_i$ ) are correlated with at least one of the regressors, such that the null hypothesis claims they are not correlated. If the null hypothesis is rejected, the conclusion is that the random effect is not appropriate and that we may be better off using fixed effect model (FEM), in which case statistical inferences will be conditional on the non-constant error term in the sample. This test is critical in panel data econometrics as it enable us to decide if there exists a time effect on top of the individual effect as well as if the estimated coefficients are constant across individuals. These tests follow a simple principle of comparing the restricted and unrestricted models using likelihood ratio (LR) or Wald statistics where the null distributions follow Chi square, with degrees of freedom matching the number of restrictions.

**Table 4.5: Hausman Test statistics**

Variables	Coefficients		Difference	Std. Error
	Fixed Effect	Random Effect		
AGC	-.0035174	-.0041597	.0006423	.004871
LVC	-.1664678	-.1715774	.0051095	.0548795
SZC	.0577347	.0483027	.0094319	.0103894
LQC	.0221213	.0249822	-.0028609	.0142596
PGC	.0009172	.0010817	-.0001645	.0001051
TAC	-.0143101	-.0237003	.0093902	.0402843
<b>chi2(6)=</b>			<b>3.15</b>	
<b>Prob&gt;chi2 =</b>			<b>0.7892</b>	

*Source: Own computation and STATA reg. (2018)*

Based on the table 4.5 the Hausman test reveals that the appropriate model is random effect model as the null hypothesis of the model which claims the difference in coefficients are not systematic (random), can't be rejected at any level of significance based on the Chi2 value reported above. Accordingly, the model selected for the data under consideration is random effect (Error component) model. By selecting the random effect model, we acknowledge that the error term is not systematically correlated with any of the explanatory variables involved in the model and any variation in the error term is subject to chance.

Table 4.6 Estimation results of the random effect model

<b>ROA</b>	<b>Coefficients</b>	<b>Z-Value</b>	<b>P value</b>
AGC	-.0041597	-1.79	0.074***
LVC	-.1715774	-2.47	0.013**
SZC	.0483027	5.52	0.000*
LQC	.0249822	1.22	0.224
PGC	.0010817	21.33	0.000*
TAC	-.0237003	-1.02	0.307
Cons	-.228719	-3.62	0.000*
<b>Number of obs</b>		<b>108</b>	
<b>Wald chi2(6)</b>		<b>9374.64</b>	
<b>Prob&gt; chi2</b>		<b>0.0000</b>	
<b>R-sq: within</b>		<b>0.3517</b>	
<b>between</b>		<b>0.7946</b>	
<b>overall</b>		<b>0.4071</b>	

*\*, \*\* and \*\*\* represent the coefficient under consideration is statistically significant at 1 %, 5% and 10%*

*Source: Own computation and STATA reg. (2018)*

The Wald Chi2 statistics, as reported in the table above table 4.6, ensures the overall significance of the estimated coefficients, as the null hypothesis which claims the parameters are simultaneously equal to zero, would be rejected at 1 percent significance level. Given the R-sq (0.407), out of the total variation of the dependent variable (returns on asset), 41 percent is explained by (due to) the variation of the explanatory variables involved in the model.

Given the regression result reported above, table 4.6 Size of a company (SZC), Premium growth rate (PGR) of a company, Leverage (LVC) and age of the company (AGC), are statistically significant at 1, 5 and 10 percent level where the first two variables are significant at one percent level where as the remaining two variables are significant at five percent and ten percent level respectively. On the other hand, liquidity of a company (LQC) and tangibility of a company (TAC) are statistically insignificant in affecting profitability of the insurance company under consideration at any reasonable significance level.

Among the statistically significant variables in affecting the profitability of the firm, leverage and age have negative impact on profitability while the other two variables such as size and premium growth have a positive and significant impact on profitability of the company.

#### **4.5.1. Age of the Companies**

Age of the company is negatively related with profitability of insurance companies in Ethiopia. The estimation result of the random effect model reveals that there is a negative and significant relation between profitability and age of the company with the estimated coefficient of -0.004. It can be interpreted as a one year increase in the age of the company would result in a 0.4 percent decrease in the profitability of the company keeping other things unchanged. This result is against the expectation as well as against the theory and hence is not consistent with the hypothesis of the study. It is expected that as the years of operations increases both their experiences in the sector will increase as well as the company is expected to get enough time to engage in research and development so as to increase its market share leading to increased profitability. On the other hand it is also expected that in the initial years of their operation, increased initial cost is expected which is associated with lower profitability.

Literatures also provide inconclusive evidence in relation to the profitability-age relationship in the insurance sector as some researcher such as Ali (2008), reported the absence of any significant relationship between the two variables whereas Swiss (2008), confirms this finding by concluding younger firms are relatively more profitable grow faster as compared to the older one based on his research finding conducted on insurance Companies located in Egypt.

#### **4.5.2. Size of the Companies**

Size of the company, as measured in terms of their total asset, is positively and significantly influencing the profitability of the firm. The coefficient obtained from the regression (0.048) implies that keeping all else constant, a one percent increase in the size of the company causes a 4.8 percent increase in the profitability. The finding is in line with both theory and expectation supporting the fact that both economies of scale and market power would be built as size increases.

The find is supported by different literatures such as Abate (2012), Hamadan (2008) and Swiss (2008), all claiming the existence of positive and significant relationship between size and profitability in the insurance companies. Majumdar (1997) and Re (2008), strengthen the claim by saying the size of the company affects the profitability by exploiting economies of scale as well as economies of scope. On the other hand smaller firms might face difficulty to endure the competition challenges from the large firm especially in the competitive market due to the capacity constraints. From the other end, there are arguments contradicting these findings (Simon, 2016) and Cudiamat and Siy (2017), which see the size of the company in relation with the inefficiency in management as management and its overall performance gets weaker and inefficient as the company gets larger and larger.

Similar study in Turkey conducted by Emine (2015) indicated that increases the profitability of the companies depends on the size of the company which is further supported by the findings of Burca and Batrîncea (2014), Mehari and Aemiro (2013), Doğan (2013), Almajali (2012) and Malik (2011). Therefore, the size of the company, as it is seen in this paper as well as different papers conducted on the same topic, is one of the important determinants of profitability of the insurance companies in Ethiopia. In general, the strong positive and significant impact which has been established between the size of the company and profitability can be understood as the existence of the effects of economies of scale and scope in the sector.

From the other pole, there are arguments against this finding. Andres and Jay (2017), in their literature, reported a negative and significant impact of size of the company on productivity and they explained as the stricter regulation of larger firms, specifically on companies' capital

adequacy requirements and their use of scarce economic resources, could have led the big players in the insurance industry to become more risk-averse. The diseconomies arise, according to Andres and Jay as instead of a large asset base providing firms with additional resources intended for growth, such assets are idled and placed in a reserve or not used in a productive manner in a way that results to higher profits.

### **4.5.3. Leverage Ratio of the Companies**

Leverage, as measured by total debt divided by total equity, is found to be one of the limiting factors in firms' profitability in the insurance sector in the country. According to the random effect model estimation, the coefficient of leverage is found to be negative and significant at the five percent level of significance. A negative 0.17 estimated coefficient of leverage can be interpreted as; a one percent increase in the leverage of the company would cause a decrease in the profitability by 17 percent point, in a ceteris-paribus condition. The negative sign is expected on both theoretical and empirical ground.

On the other hand there are literatures who argue the existence of some threshold values of leverage below which profitability is directly related with leverage and when the leverage increases above its optimum mix, it influences the profitability negatively. In order to test this claim, the researcher has estimated the alternative model incorporating the square of leverage (as reported in the appendix part), and the estimation signifies that the sign of the coefficient changes from positive to negative values for the level value of leverage and its square as expected which implies that for lower level of leverage ratio it contributes positively to the profitability of the company while it becomes anti profit when its value increases. But this claim can't be approved given the estimated coefficients in this model, as both coefficients were statistically insignificant in affecting the dependent variable.

The finding of this paper is also in conformity with other previous researches, such as Kie (2004), Hamadan (2008), Hifza (2011) and Abate (2012), who came up with a negative relation between leverage and profitability based on the study in different parts of the world.

#### **4.5.4. Premium growth rate Of the Companies**

Referring to the table above, Premium growth rate (PGC) has a positive and significant impact on profitability of the insurance companies with the estimated coefficient of 0.001 which is significant at 1 % level of significance. The coefficient obtained from the regression (0.001) implies that keeping all else constant, a one percent increase in the premium growth rate of the company causes a .1 percent increase in the profitability. The positive sign is in line with our expectation, as the increase in premium growth rate ensures the growth of the company as well as the increase in its market share. This finding is supported by other literatures such as Yuqi (2007) and Hamadin (2008) as both researches claim the existence of positive and significant relation between premium growth rate and companies' profitability. On the other hand it is against the findings of Chen and Wong (2004) and Mistre (2015) who claimed the absence of any significant relationship between the two variables.

As part of the researcher's objective, the relative share of variables entered as the explanatory variables, without considering the sign (variables in absolute term) can clearly be seen based the Table above (table 4.6) where the statistically insignificant variables are considered. Based on the magnitude of the coefficients estimated, leverage comes to front side putting relatively strong impact on profitability with the estimated coefficient of -0.172. As this leading variable has a negative impact on profitability, insurance companies should pay enough attention in managing the leverage ratio of the company.

The second largest impact is exerted from the size of the company (0.048), which implies the size of the insurance companies is the second strongest determinants of profitability in the sector putting a positive pressure on the profitability of the firm. The remaining two variables are age and premium growth rate with their respective impact of -0.004 and 0.001. Knowing the relative importance of variables might be helpful for the insurance sectors, particularly, located in the study area (Ethiopia) to make prioritization in their plan to attain high and sustainable profitability of the sector by selecting the appropriate variables to be intervened.

## 4.5 Consistency of the estimated Coefficients Across different Models

For further inferences using the estimated coefficients, the estimated coefficients should not be too volatile from one model to the other, so that its value should not be arbitrary and hence relayed upon. To make sure that the estimated coefficients of the random effect model is consistent, alternative models are employed such as the fixed effect model as well as the Ordinary list square model (OLS) as reported in the table below (table 4.6). In terms of their sign and magnitude as well as statistical significance, variables are more or less consistent in all the three models.

**Table 4.7: Coefficients across different Models**

ROA	Coefficients		
	RE	FE	OLS
AGC	-0.0041***	-0.0035***	-0.0042***
LVC	-0.1715*	-0.1664	-0.1741*
SZC	0.0483*	0.0577**	0.0465*
LQC	0.0249	0.0221	0.0251
PGC	0.0010***	0.0009***	0.0011***
TAC	-0.0237	-0.0143	-0.0302
Cons	-0.228	-3.62	-0.2111
Chi2	64.32	-	-
AIC	-	-370.70	-361.03
BIC	-	-351.92	-342.25

*Legend: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$*

*Source: Own computation and STATA reg. (2018).*

The negative result obtained from the random effect model for age, leverage and tangibility remain negative in all the three models whereas the remaining variables are positive. This consistency proves that the estimates and their respective signs obtained by the selected model (the random effect model) are not accidental as it would have been the case if alternative models



had been used. In terms of their statistical significance, Age which is significant in three effect model at 5 percent significance level. The leverage is significant at 5 percent in two model RE and OLS but significant at ten percent in FE model. Size and Premium growth are significant at 1 percent significance level in the three models whereas liquidity and tangibility remained insignificant in every model at every acceptable level of significance.

As supported by the above justification, the selection of the model (though necessary for treatment of the error term and its respective inferences) doesn't have any impact in terms of the estimates obtained and the level of significance reported. This claim is also justifiable by many previous literatures which adopted relatively different models and came up with slightly similar conclusions. Bilal, (2013) adopted a fixed effect model in search of the determinants of the profitability of the insurance companies whereas Wasike, (2016) used ordinary least square (OLS) model on the pooled data looking for the same objective where both researcher arrived in to similar conclusion for most of the variables entered into their models.

# **CHAPTER FIVE**

## **CONCLUSION AND RECOMMENDATIONS**

### **5.1. Conclusion**

Financial markets and institutions not only affect one's everyday life but also involve huge flows of resources throughout the economy, which in turn affect business profitability, the production and productivity of goods and services, and even the economic well-being of countries other than the home country. Hence the healthy performance of the financial sector has its direct and indirect impact on the performance of economic growth in general.

Being part of the financial sector, insurance sector has a vital role in contributing to the healthy performance of the financial sector as well as the performance of other sectors by keeping their solvency to continue in the time of hardship. In order for the contribution of the insurance sector to the economy to continue, its profitability need to be ensured, as most of them is private owned profit seeking company. To ensure the sectors' continuity and sustainability, the factors responsible for its profitability should be well known to the owners of the company as well as to the policy makers.

Having the above objective in mind, this study aims to find out the company specific factors that determine the profitability of the insurance companies in Ethiopia. To achieve this objective of sample nine insurance Companies are selected and the relevant panel dataset are obtained from each company for 12 years starting from 2005 to 2016. The choice of years is made based on the availability of full datasets for each sample company selected. Given the objective at hand, both descriptive and econometric methods are adopted. As part of the descriptive analysis, different descriptive statistics (such as mean Standard deviation, maximum, minimum as well as correlation) are computed. Additionally, after making different diagnostic tests (such as unit root test and other tests on the violation of the classical assumption) on the data econometric regression is applied using the random effect model, as suggested by the Hausman specification test.

According to the descriptive statistics using covariance analysis, variables such as age of the company, leverage ratio and tangibility of asset are negatively correlated with the profitability of the firm while the remaining variables (size of the company, liquidity of the company and premium growth rate) have a positive association with the profitability. To this end, the negative relationship between age and profitability as well as leverage and profitability from the descriptive statistics is also confirmed using the econometric model and the sign is consistent between fixed and random effect models. The estimated mean values and their associated standard deviation of variables entered into the model also reflect that there is only moderate disparities that exist among the insurance companies in terms of their profitability, leverage ratio and other related variables, as the variation of these variables across the companies are estimated to be moderate.

Based on the regression results, the company specific variables such as the Size of a company, Premium growth rate of a company, Leverage ratio and age of the company play strong impact on the profitability of the company. On the other hand, liquidity of the company and tangibility of a company do not have any significant impact in affecting the profitability.

Among the statistically significant variables in affecting the profitability of the firm, leverage ratio and age of the companies have negative impact on profitability while the other two variables such as size of the company and premium growth rate of the company have a positive and significant impact on profitability of the companies. Through, it needs further study in the area so as to confirm using alternative research, the negative relation between age and profitability is unexpected and against the research hypothesis. This may be due to the old system and technology adopted by the earlier established companies may cause the loss of their customers, as the unsatisfied customers may migrate towards the newly established Companies so that as more and more companies join the market, the older companies may lose their market.

Generally, in terms of the relative share of the company specific variables in affecting the profitability of the company, leverage ratio is found to be the leading variable in affecting profitability while followed by size and age of the company so that any policy prioritization should give relatively attention in managing the companies' profitability.

## 5.2. Recommendations

Based on the research findings the following policy implications are drawn:

- Insurance Companies owners should give enough attention to the size of their company as part of their long run strategy in achieving higher profitability and market share. It is worthwhile to have high consideration of increasing the company assets. Because the size of the company is an important factor as it influences its competitive power. To this end, recognizing the non-competitive nature of the sector, government and other concerned bodies should take the size of the insurance company into respect, as the newly established infant insurance companies may not be able to withstand the competitive pressure from the bigger companies unless otherwise supported by the government.
- Enough attention should be paid to leverage ratio of the company recognizing the fact that companies with relatively higher leverage are at risk of bankruptcy on one hand and on the other hand there may be the case that leverage may cause the shareholders' return on investment to increase. Companies should not have much more current assets than their current liabilities. Hence, the insurance companies of Ethiopia should first reduce the idle cash and other current assets generated from borrowing and then they have to use their liquid assets properly by searching for available alternative investments. Therefore, leverage should be one of the closely watched variables in the process of financial management.
- Insurance companies should also strive for increasing the Premium growth rate of the company as measured by the percentage increase in gross written premiums, as the effective increase in this variable may be associated with higher profitability of the company.
- For the unexpected and negative impact of age of the company on the profitability, based on the estimated result of the model, the researcher recommend other interested researchers to make further investigation in the area so as to endorse or reject this claim made by the researcher.

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# Appendix-1 Descriptive Statistics

## 1. Descriptive Statistics

. xtsum roa agc lvc szc lqc pgc tac

Variable		Mean	Std. Dev.	Min	Max	Observations	
roa	overall	.0801852	.0556521	-.05	.4	N =	108
	between		.0233325	.0433333	.1166667	n =	9
	within		.0510757	-.0364815	.3635185	T =	12
agc	overall	2.111833	.8736525	1.47	7.72	N =	108
	between		.6722525	1.5575	3.345	n =	9
	within		.5981678	1.247667	7.795166	T =	12
lvc	overall	.6742593	.086718	.45	.84	N =	108
	between		.074353	.55	.7716667	n =	9
	within		.0505961	.5592592	.8042593	T =	12
szc	overall	8.379352	.447705	7.36	9.45	N =	108
	between		.3520147	7.8275	9.113333	n =	9
	within		.2987712	7.347685	8.954351	T =	12
lqc	overall	.9819444	.2593322	.26	2.31	N =	108
	between		.1348437	.7383333	1.216667	n =	9
	within		.2256981	.4452778	2.075278	T =	12
pgc	overall	7.800648	23.43499	-.14	221.04	N =	108
	between		11.82746	1.708333	38.49167	n =	9
	within		20.58375	-29.74102	190.349	T =	12
tac	overall	.1830556	.1097274	.04	.54	N =	108
	between		.0755478	.075	.3266667	n =	9
	within		.0831829	.0005556	.4422222	T =	12

# Appendix-2 Different Diagnostic Test

## 1. Different Diagnostic Test Statistics

### a. Test for time fixed effect

```
. xi: xtreg roa agc lvc szc grc lqc pgc tac i.year, fe
i.year          _Iyear_2005-2016      (naturally coded; _Iyear_2005 omitted)

Fixed-effects (within) regression              Number of obs   =       108
Group variable: insuranccec~e                 Number of groups =         9

R-sq:  within = 0.5173                          Obs per group:  min =        12
        between = 0.1967                          avg           =       12.0
        overall  = 0.2911                          max           =        12

corr(u_i, Xb) = -0.7084                          F(18,81)        =        4.82
                                                Prob > F         =       0.0000
```

roa	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
agc	-.0023574	.0072344	-0.33	0.745	-.0167517	.0120368
lvc	-.1790639	.1133347	-1.58	0.118	-.4045643	.0464365
szc	-.0680583	.0453936	-1.50	0.138	-.1583773	.0222607
grc	-.0056025	.0019661	-2.85	0.006	-.0095146	-.0016905
lqc	.0473265	.0337401	1.40	0.165	-.0198057	.1144588
pgc	.0009079	.0002137	4.25	0.000	.0004826	.0013331
tac	-.002178	.0769534	-0.03	0.977	-.1552912	.1509351
_Iyear_2006	.0005893	.0276004	0.02	0.983	-.0543268	.0555053
_Iyear_2007	.0185074	.0257937	0.72	0.475	-.032814	.0698289
_Iyear_2008	.0441733	.0252774	1.75	0.084	-.0061209	.0944675
_Iyear_2009	.0565168	.0270758	2.09	0.040	.0026445	.1103892
_Iyear_2010	.0853724	.0298389	2.86	0.005	.0260024	.1447424
_Iyear_2011	.0940438	.0327431	2.87	0.005	.0288953	.1591923
_Iyear_2012	.1195226	.0372388	3.21	0.002	.0454291	.1936161
_Iyear_2013	.1487799	.0403091	3.69	0.000	.0685775	.2289824
_Iyear_2014	.1705297	.0430541	3.96	0.000	.0848656	.2561937
_Iyear_2015	.1464969	.041425	3.54	0.001	.0640742	.2289197
_Iyear_2016	.1909602	.0485601	3.93	0.000	.0943409	.2875795
_cons	.6730084	.3403643	1.98	0.051	-.0042097	1.350227
sigma_u	.04577438					
sigma_e	.04078344					
rho	.55746912	(fraction of variance due to u_i)				

F test that all u\_i=0: F(8, 81) = 1.70 Prob > F = 0.1110

```
. testparm _Iyear
_Iyear ambiguous abbreviation
r(111);
```

```
. testparm _Iyear*
```

- ( 1) \_Iyear\_2006 = 0
- ( 2) \_Iyear\_2007 = 0
- ( 3) \_Iyear\_2008 = 0
- ( 4) \_Iyear\_2009 = 0
- ( 5) \_Iyear\_2010 = 0
- ( 6) \_Iyear\_2011 = 0
- ( 7) \_Iyear\_2012 = 0
- ( 8) \_Iyear\_2013 = 0
- ( 9) \_Iyear\_2014 = 0
- (10) \_Iyear\_2015 = 0
- (11) \_Iyear\_2016 = 0

F( 11, 81) = 2.29  
Prob > F = 0.0170

Based on this test which claims there is no difference between the coefficients across different time, the null hypothesis is rejected based on the F-stat reported above and its associated probability (0.017). where at 95 confidence level the null hypothesis which claims the similarity of coefficient across time will successful be rejected implying that the time component is still important to this dataset

## b. Testing for random effects: Breusch-Pagan Lagrange multiplier (LM)

Breusch and Pagan Lagrangian multiplier test for random effects

$$\text{roa}[\text{insurancecode},t] = \text{xb} + \text{u}[\text{insurancecode}] + \text{e}[\text{insurancecode},t]$$

Estimated results:

	Var	sd = sqrt(Var)
roa	.0030972	.0556521
e	.00192	.0438177
u	.000019	.004358

Test:  $\text{Var}(u) = 0$

chi2(1) = 0.83  
Prob > chi2 = 0.3624

Based on the Breusch Pagan lagrange multiplier (LM) test is the claim that the model is best suited for random effect is accepted as the null cant be rejected at any level of significance

### c. Multi-Collinearity

. estat vif

variable	VIF	1/VIF
lvc	2.01	0.497831
tac	1.89	0.527776
lqc	1.70	0.587068
szc	1.43	0.700578
agc	1.11	0.902446
pgc	1.04	0.957660
Mean VIF	1.53	

The absence of multicollinearity is ensured based on the variance inflating factor (VIF) test as the mean vif (1.53) is significantly below 10

## d. Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of roa

chi2(1) = 0.84

Prob > chi2 = 0.3582

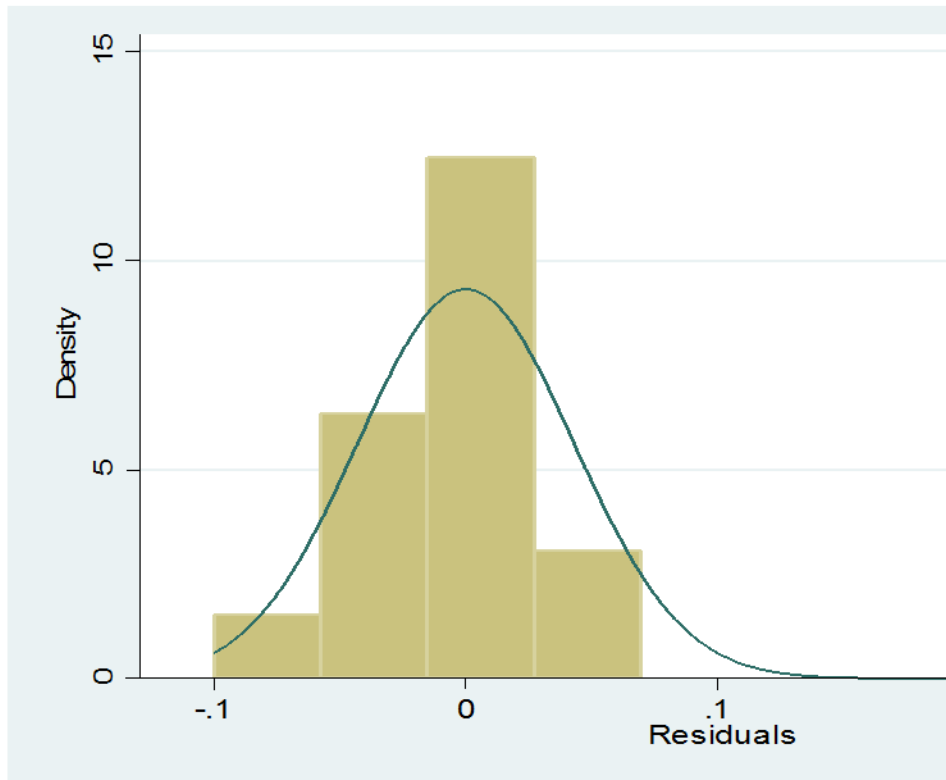
. imtest

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	9.00	27	0.9995
Skewness	2.48	6	0.8703
Kurtosis	1.07	1	0.3006
Total	12.56	34	0.9997

The presence of homoscedasticity (constant variance) is checked using both Breusch-Pagan (Cook-Weisberg) test and the Cameron & Trivedi's decomposition of information matrix (IM) test. The null hypothesis of both tests claim the absence of heteroscedasticity problem and this claim can't be rejected at any reasonable level of significance.

## e.Normality



```
. mvtest normality e
```

Test for multivariate normality

Doornik-Hansen

chi2(2) = 102.323 Prob>chi2 = 0.0000

## Appendix-3 Correlations

(obs=108)

	roa	agc	lvc	szc	lqc	pgc	tac
roa	1.0000						
agc	-0.0423	1.0000					
lvc	-0.0745	-0.1504	1.0000				
szc	0.2592	0.0577	0.5042	1.0000			
lqc	0.2635	0.0797	-0.3236	-0.0505	1.0000		
pgc	0.5106	-0.0757	0.0270	0.0257	0.1268	1.0000	
tac	-0.2225	0.1954	-0.3884	-0.3247	-0.3734	-0.1887	1.0000



**Estimated coefficients across Different Models**

. estimates table n1 n2 n3, stats(chi2 df N aic bic) se p style(online)

Variable	n1	n2	n3
agc	-.00421979 .00283213 0.1393	-.00415972 .00232894 0.0741	-.00351739 .00210877 0.1339
lvc	-.17413649 .04771942 0.0004	-.17157738 .06932846 0.0133	-.16646783 .13044207 0.2377
szc	.04650365 .00967483 0.0000	.04830274 .00875692 0.0000	.05773465 .01376321 0.0030
lqc	.02511762 .0223404 0.2635	.02498219 .02053736 0.2238	.02212134 .02837537 0.4581
pgc	.00113312 .00022875 0.0000	.00108172 .00005072 0.0000	.00091718 .00004862 0.0000
tac	-.03028333 .03355444 0.3689	-.02370028 .02321487 0.3073	-.01431007 .05585597 0.8043
_cons	-.21112029 .06934061 0.0030	-.22871897 .06310159 0.0003	-.31018015 .10282074 0.0166
chi2	9374.6439		
df			
N	108	108	108
aic	-361.02793	.	-372.69588
bic	-342.25301	.	-356.60309

Legend: b/se/p

n1, n2 and n3 represent OLS, Random and Fixed effect models respectively where the coefficients, standard error, and the P-values are reported sequentially

## Optimum mix of the leverage ratio

```
. xtreg roa agc lvc szc lqc pgc tac LVCSQ, re robust

Random-effects GLS regression           Number of obs   =    108
Group variable: insurancec~e           Number of groups =     9

R-sq:  within = 0.3570                 Obs per group:  min =    12
        between = 0.8174                 avg =    12.0
        overall = 0.4165                 max =    12

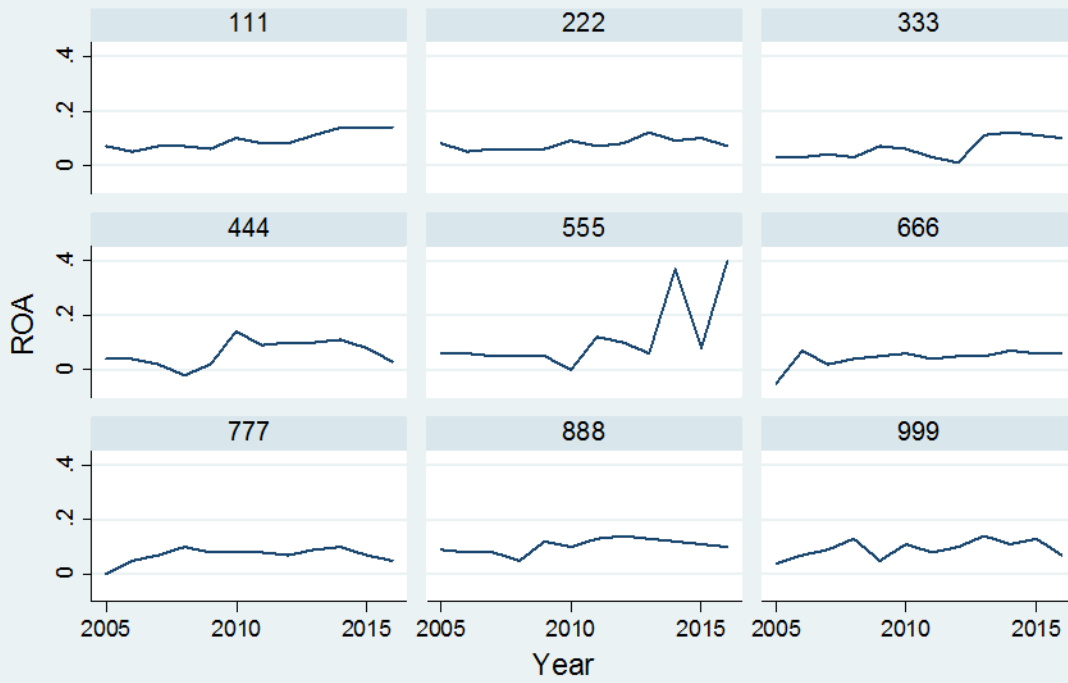
Random effects u_i ~ Gaussian           wald chi2(7)     = 10296.09
corr(u_i, X) = 0 (assumed)             Prob > chi2      =  0.0000
```

(Std. Err. adjusted for 9 clusters in insurancecode)

roa	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
agc	-.0015994	.0024438	-0.65	0.513	-.0063891	.0031904
lvc	.639386	1.016388	0.63	0.529	-1.352697	2.631469
szc	.0480469	.0088523	5.43	0.000	.0306966	.0653972
lqc	.032142	.0242246	1.33	0.185	-.0153374	.0796214
pgc	.0010394	.0000614	16.93	0.000	.0009191	.0011597
tac	-.0134762	.0317113	-0.42	0.671	-.0756292	.0486767
LVCSQ	-.597003	.7833025	-0.76	0.446	-2.132248	.9382416
_cons	-.511493	.3280191	-1.56	0.119	-1.154399	.1314126
sigma_u	.01291103					
sigma_e	.0440459					
rho	.07912464	(fraction of variance due to u_i)				

The presence of the optimum level of the leverage ratio below which it contributes positive impact on profitability while if it once exceed the optimum level, it starts to play its negative role on profitability which implies that the existence of some threshold level. To test this claim, both leverage ratio and its square is incorporated into the model and the test result shows both coefficients are statistically insignificant while the sign alternates from the level value to the squared value as expected.

## Return on Asset (ROA)



Graphs by Insurance code