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The Determinants of Insurance Companies Profitability in Ethiopia

A Thesis Submitted to the Department of Accounting and Finance, College of Business and Economics, Addis Ababa University, in Partial Fulfillment of the Requirements for Degree of Master of Accounting and Finance

Addis Ababa University

Addis Ababa, Ethiopia

Feb, 2019

By Tariku Ashenafe Birru GSE/2407/09

ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF ACCOUNTING AND FINANCE

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Statement of Declaration

I, the undersigned, declare that this thesis entitled “**The Determinants of insurance companies’ profitability in Ethiopia**” in partial fulfilment of the requirement of the Master of Science degree in Accounting and Finance with the close guidance and support of my advisor Dr. Degefe Duressa. And it is my original work, has not been presented for award in any other university and all sources of materials used for this thesis have been duly acknowledged.

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ABSTRACT

The profitability of insurance companies has been the focus of several studies in emerging economies across the world. However, when it comes to Ethiopia it received little attention. Therefore, the researcher conduct this study entitled “The Determinants of Insurance Companies Profitability in Ethiopian”. The major objective of this study was to investigate the most important determinant of profitability in the insurance sector of Ethiopia by using regression analysis. This study was based on entirely secondary data collected from NBE and MOFEC. This study covers the time period from 2003 – 2017 in order to increase numbers of observations. In addition, this study used Explanatory research design to check cause and effect relationship between dependent variable and independent variables besides, fixed effect model was used. Under this study, both internal and external factors were included. Internal factors used in this study include (company age, leverage, liquidity, premium growth, underwriting risk and tangibility of asset) whereas, the external factor are market share, economic growth and inflation. Moreover, ROA and ROE were used to measure Profitability. The regression result reveals that company age, market share and GDP have significant impact on the profitability of Ethiopian insurance companies measured by both return on asset and return on equity in addition to those three variables premium growth also have positive significant effect on profitability of Ethiopian insurance companies peroxide by return on asset. While other variables included in the research have insignificant effect on profitability of Ethiopian insurance companies measured by both models. Finally, the study suggests the mangers of Ethiopian insurance companies to prepare themselves for macroeconomic changes by preparing financial plans and to provide new product lines and making extensive advertisement that maximizes their market share.

Key words: *profitability, return on asset, return on equity, market share.*

Acknowledgements

First and for most, My deepest and warmest thank goes to the Almighty God and His mother Saint Marry, who help me in all aspect of my life including the achievement of this thesis. Along with, I would like to express my sincere gratitude to my advisor Dr. Degefe Duressa for his expert guidance, helpful criticism, valuable suggestions and encouragement at every stage during the completion of this work.

I am also grateful, to the managers and insurance supervision department staffs of NBE, for their assistance. My special thanks also goes to my parents, family, friends and coworkers who have contributed in many ways toward the completion of this thesis and their endless support throughout my life.

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List of Abbreviations and Acronyms

| | |
|-------|--|
| AGE | Company Age |
| CLRM | Classical Linear Regression Model |
| CACL | Current Asset to Current Liability |
| CR | Current Ratio |
| DW | Dublin Watson |
| EIC | Ethiopian Insurance Corporation |
| FEM | Fixed Effect Model |
| GDP | Gross Domestic Product |
| GP | Premium Growth |
| GWP | Growth Written Premium |
| HO | Null Hypothesis |
| H1 | Alternative Hypothesis |
| INF | Inflation |
| LIQ | Liquidity |
| LV | Leverage |
| MOFED | Ministry of Finance and Economic Development |
| MOFEC | Ministry of Finance and Economic Cooperation |
| MS | Market Share |
| NANPW | Net Asset to Net Written Premium |
| NBE | National Bank of Ethiopia |
| OLS | Ordinary List Square |
| REM | Random Effect Model |
| ROA | Return on Asset |

ROI Return on Investment

ROE Return on Equity

TAN Tangibility of Asset

CHAPTER ONE

INTRODUCTION

1.1 Background of The Study

Financial institutions play a significant role in the socio-economic growth and development of a nation. Insurance companies, in particular, facilitate a nation's innumerable economic transactions through efficient and effective savings mobilization, risk transfer, indemnification, and financial intermediation processes (Salvatore, 2013; Mishkin, 2010). By mobilizing long-term savings, these companies provide financial security to a nation's citizens. Further, they enhance the government's accumulation of productive capital, which is primarily invested in long term investment instruments that can be used for infrastructure development. As the dominant segment in the insurance market, the sustainability of the insurance business is crucial for developing nations. They play an active role as the country's protection and repair system (Sambasivam & Ayele, 2013). Ward & Zurbruegg (2000) observed that as insurance markets develop, the collection of productive capital within the economy develops as well. The profitability of insurance firms not only improves the insurers' ability to meet long-term financial obligations, but also emboldens policyholders and stockholders to provide funds to such firms, as an essential qualification for administrating insurance business (Andres. C & Stephen J, 2017).

As financial institutions, it has been established that insurance companies actively participate in contributing to the economic growth of nations. In fact, the United Nations Conference on Trade and Development, as noted by Outreville (1996), formally acknowledged in its first meeting in 1964 that "a sound national insurance and reinsurance market is an essential characteristic of economic growth".

Although the insurance industry has grown rapidly in the industrialized countries, its growth in developing countries like Ethiopia has neither been satisfactory nor in tandem with the growth of other sectors of the economy. One reason for this is their performance is not as such satisfactory. According to Iswatia and Anshoria (2007), performance is the function of the ability of an organization to gain and manage the resources in several different ways to develop competitive advantage. According to Walker (2001) there are two kinds of performance, financial performance and non-financial performance. Financial performance emphasizes on variables related directly to financial report. Company's performance is evaluated in three dimensions. The first dimension is company's productivity, or processing inputs into outputs efficiently. The second is profitability dimension, or the level of which

company's earnings are bigger than its costs. The third dimension is market premium, or the level of which company's market value is exceeding its book value.

According to Hifza Malik (2011), the concept of profitability is one of the most important objectives of financial management since one goal of financial management is to maximize the owners' wealth, and profitability is very important determinant of performance. A business that is not profitable cannot survive. Conversely, a business that is highly profitable has the ability to reward its owners with a large return on their investment. Hence, the ultimate goal of a business entity is to earn profit in order to make sure the sustainability of the business in prevailing market conditions.

Recently, the performance of the insurance industry has been the subject of interest particularly, the profitability of insurance companies has been the focus of several studies in emerging economies across Asia, Africa and the Middle East with Return on Assets (ROA) as the most commonly used proxy for profitability and performance. To list some of them Hifza Malik (2011) analyzed "Determinants of Insurance Companies Profitability on the insurance sector of Pakistan", B. Charumathi, (2012) studied "The Determinants of Profitability of Indian life Insurers." Andres & Stephen (2013) conducted their studies on "Determinants of profitability on Philippine life insurance companies" Mirie Mwangi (2015) conducted a research in Kenya by the title of "determinants of financial performance in general insurance companies in Kenya", and Kazimierz.O (2016) conducted financial analysis on "The Determinants of profitability of general insurance companies' performance in Poland."

There has been a growing number of studies that test for measures and determinants of firm profitability. Financial industry's profitability has attracted scholarly attention in recent years due to its importance in performance measurement. However, based on literature review, in the context of the insurance sector particularly in developing countries like Ethiopia has received little attention on profitability of insurance. Therefore, this study focused on identifying determinants of insurance companies' profitability in Ethiopia.

1.2 Statement of the Problem

The insurance sector plays important role in the financial services industry of developed and developing countries, contributing to economic growth, efficient resource allocation, reduction of transaction costs, creation of liquidity, facilitation of economics of scale in investment, and spread of financial losses (Haiss and Sümegi, 2008). Much of the extensive empirical literature on the determinants of profitability are mostly focused on the banking industry (Williams, 2003, Vejzagic and Zarafat, 2014). However, very little studies are conducted on the profitability of insurance industry in Ethiopia is what motivated the researcher to put his own contribution on what determines the profitability of insurance companies in Ethiopia. According to the researcher's knowledge, the studies conducted in the areas of insurance are few in number and did not give such an emphasis on the factors considered to be determinants of profitability of insurance industry in Ethiopia.

For instance, Abate G. (2012) studied factors affecting insurance companies' profitability in Ethiopia. He focused only on internal factors and has not considered external factors like macroeconomic factors (GDP and Inflation). On the other hand, Suheyli R.(2015) conducted study the same area showed that underwriting risk, technical provision and solvency ratio have significant negative relationship and liquidity, company size and premium growth have positive significant relationship with profitability. Meaza M. (2014), from the regression result find out that; firm size, tangibility of asset, firm growth and, managerial efficiency are positively related. In contrast, leverage and loss ratio/ risk are negatively but significantly related with profitability. Liquidity, inflation, and economic growth are not significant determinants of profitability. Redwan K. (2016) analyzed the factors affecting insurance companies' profitability, the findings indicate that liquidity ratio have positive significant effect while leverage, economic growth and inflation have negative significant effect on profitability. Finally, Kalkidan (2017) also conducted a study in this area the results clearly show size, tangibility of asset and economic growth have significant relation with profitability on the other hand loss ratio , premier growth and economic growth has negative significant and liquidity and market concentration insignificant effect on profitability.

Even though they focused on both internal and macroeconomic factors that affect insurers' profitability in Ethiopia they did not consider basic industry specific factors like market share Chen-Ying lee (2014). In addition to the above literature gap, there is inconsistency on the findings of the previous studies

conducted in this research title. Findings from previous research tend to vary across time periods and they are highly contradicting result for instance, according to Abate and Yuveraj (2012) and Abate (2012) and Teklit & Jasmindeep (2016) liquidity has negative and significant effect on profitability but on the other hand, Behaylu (2017) and suheyli (2015) conclude liquidity has positive and significant effect on profitability. This inconsistency holds true for premium growth, leverage, tangibility of asset, GDP and inflation.

Therefore, this study contributes to the existing study by proven which variables positively affect and which variables negatively affect profitability and fill the above explained knowledge gap by providing information about the internal, industry specific and external factors that affects profitability by examining the untouched ones, replicating the existing and utilization of the model by using ROA and ROE as a measure for insurers' profitability of all insurance company operating in the country that have 15 years data. In addition, the study provide insights into the recent profitability determinants of insurance companies in Ethiopia.

1.3 Objective of the Study

1.3.1 General objective

The core objective to conduct this study was to investigate the most important determinant of profitability in the insurance sector of Ethiopia over the period 2003-2017.

1.3.2 Specific objectives

The specific objectives of the study are:

1. To determine the effect of company specific variables on the profitability of Ethiopia insurance companies.
2. To check whether market share has significant impact on the profitability of Ethiopia insurance companies.
3. To examine whether macroeconomic variables have an impact on the profitability of Ethiopia insurance companies.

1.4 Research Hypothesis

Research hypothesis is a predictive statement capable of being tested by scientific methods that relates independent variables to some dependent variable. So that for achieving the objectives of these study, the following research hypotheses were developed regarding the determinants of profitability in Ethiopia insurance companies based on prior empirical research and theoretical review made.

H1. Company age has a positive and significant impact on profitability of insurance companies in Ethiopia.

H2. Leverage ratio has a negative and significant impact on profitability of Ethiopian insurance companies.

H3. Liquidity ratio has a negative and significant impact on profitability of insurance companies in Ethiopia.

H4. Premium growth has a positive and significant impact on profitability of Ethiopian insurance companies.

H5. Underwriting risk has a negative and significant impact on profitability of insurance companies in Ethiopia.

H6. Tangibility of asset has a positive and significant impact on profitability of insurance companies in Ethiopia.

H7. Market share has a positive and significant impact on profitability of insurance companies in Ethiopia.

H8. Inflation has negative and significant impact on profitability of insurance companies in Ethiopia.

H9. Economic growth has positive and significant impact on profitability of insurance companies in Ethiopia.

1.5 Significance of the Study

The main reason for this study were that the researchers have not paid enough attention to this subject in Ethiopia. Therefore, this study would drop light on the scarcity of these types of study. This study, attempted to assess the determinants of insurance companies' profitability in Ethiopia, and provides evidence on what effect the firm-specific factors and macroeconomic factors have on the insurance company's profitability in Ethiopia. Analysing and understanding the impact of different factors on the insurance profitability in Ethiopia is a major stepping result to enlighten what should be done if profitability is to be achieved. Therefore, the findings of the study would benefits to insurance companies, regulatory authorities, managers and others interested parties in the area and give the opportunity to gain deep knowledge about the relationship of internal and external factors with profitability. This in turn helps those knowing factors affecting profitability and thereby takes appropriate actions to increase profitability of insurance industry. Moreover, the researchers also contribute that this study would potentially serve as a stepping stone for further research in the area.

1.6 Scope and limitation of the Study

The scope of the study determined by the objective of the research which is stated earlier and it's emphasizes on identify and examining the determinants of profitability. The study focused only on the determinants of profitability of insurance companies in Ethiopia. There are only one public insurance sector and 16 private insurance companies in Ethiopia. 9 out of 17 insurance companies will include in the sample. 8 excluded insurance companies are either newly established (not operational before 2003) or their data is not retrievable. Secondary annual balanced panel data of selected insurance companies for 15 years (2003-2017) used in this study; the time period is used to get relevant and recent data for the study. The study focused on firm's specific determinants like (company age, liquidity ratio, leverage ratio, underwriting risk, premium growth, tangibility of asset and market share,) and macroeconomics determinants like (growth rate of GDP and inflation). Scope of the study confined merely on the quantitative measure of determinates of insurance companies profitability in Ethiopia. Therefore the researcher used entirely secondary data for the study. This study is based on entirely secondary data and the limitation of using secondary data may affect the results and the secondary data collected from income statement, balance sheet was limited to only General insurance business, because income

statement of life assurance business is not prepared at the end of each year. It may be prepared one time in three years or five years due to difficulty to prepare income statement of life assurance business and it needs an actuary which is high cost and also not all insurance company in Ethiopia gives life assurance services.

1.7 Organization of the paper

The research paper organized in to five chapters. Chapter one is introduction in which overview of the insurance industry background, statement of the problem, objectives of the study, formulation of research hypothesis, significance of the study and scope and limitation of the study presented. Chapter two would be review of related literature in which theories, empirical evidence and conceptual frame work are identified. Chapter three is research design and methodology. Chapter four is data analysis and discussion in which the finding results interpreted. Finally, Chapter five brings to an end the research with summary, conclusions and possible recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter deals with the concept of insurance companies and profitability, profitability related theories and studies on the determinants of insurance company's profitability. The review divided into three sections. The first section discusses about theoretical reviews, concept of insurance companies profitability and profitability related theories will present. In addition empirical reviews on determinants of insurance company's profitability and conceptual framework will presented in the second and third section respectively.

2.1 Brief History of Ethiopian Insurance Companies

Financial institutions are the most important engines of economic growth for any economy in the world. In Ethiopia the major financial institutions operating are banks, insurance companies and micro-finance institutions. 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 (NBE report 2nd quarter 2016/2017).

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 (Hailu Zeleke, 2007).

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 and merged them into a single unit called Ethiopian Insurance Corporation. In the years following nationalization, Ethiopian Insurance Corporation became the sole operator of the sector (Hailu Zeleke, 2007).

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, According to National Bank of Ethiopia report 2nd quarter 2016/2017 the numbers of insurance companies remained at 17, consists of 16 private and 1 public insurance companies. Total branch office increased to 465 as at the second quarter of 2016/17 from 405 a year earlier, of the total branches, about 54.4% were in Addis Ababa. the total capital of the insurance sector in Ethiopia has an aggregate capital of 1.8 billion birr- an increase of 600 million birr from the previous year. In paid- up capital too, there has been a welcome change in the sector. Although previously a paid- up capital of only seven million birr (four million for general insurance and three million birr for life insurance) was required, this has been raised to 75 million birr (60 million birr for general insurance and 15 million for life insurance (NBE report 2nd quarter 2016/2017).

2.2 Theoretical Review

2.2.1 Insurance

There is no single definition for insurance. Insurance can be defined from the view point of several disciplines, including law, economy, history, risk theory and sociology. A working definition of insurance and the one that captures the essential characteristics of a true insurance plan by the Commission on Insurance terminology of the American Risk and Insurance Association is defined as Insurance is contract in which the insured transfer risk to potential loss to the insurer who promise to compensate the former upon suffering loss. Insurance premium is the monetary consideration paid by the insured for the cover granted by the insurance policy. The insurer take a number of clients (insured) who pays small premium that form an aggregate fund is called the premium fund (Walker, 2001).

Also from another view point the term insurance defined by referring two important schools of thoughts: i) transfer school and ii) pooling school. According to **transfer school**, “insurance is a device for the reduction of uncertainty of one party, called the insured, through the transfer of particular risks to another party ; called the insured, who offers a restoration, at least in part of economic losses suffered by the insured” (Irving, 1956). On the other hand, according to **pooling school** “the essence of insurance lies in the elimination of uncertainty or risk of loss for the individual through the combination of large number of similarly exposed individuals” (Alfred, 1935), cited in (Tanveer, 2010). Insurance operates on the principle of pooling risks where the people contribute to a common fund in form of premiums and where the lucky ones who do not suffer loss help the unlucky ones who suffer loss during a defined insurance period (Irukwu, 1994).

Moreover, there is another definition by Bickelhaupt (1983) that defines insurance as: an agreement by which one party (the insurer) promises to pay another party (the insured or policy holder) a sum of money if something happens which causes the insured to suffer a financial loss. Hence, in the case of accident the responsibility for paying such losses is transacted from policy holder to the insurer. In return for accepting the burden of paying for losses when they occur, the insurer charges the insured a price called the insurance premium.

2.2.2 Concept of Insurance Companies

The financial system comprises of financial institutions, financial instruments and financial markets that provide an effective payment, credit system and risk transfer and thereby facilitate channelizing of funds from savers to the investors of the economy (Boadi and et al 2013). As part of financial institution, social welfare created by insurance companies is unquestionable. A well developed and evolved insurance sector is a bone for economic development as it provides long term funds for infrastructure development at the same time strengthening the risk taking ability of the country (B. Charumathi, 2012). Chen and Wong (2004) also suggest that a strong and healthy insurance sector is at most importance for all groups and sectors of the economy.

Insurance serves a number of valuable economic functions that are similar and largely distinct from other types of financial intermediaries. According to Malik (2011) insurance plays a crucial role in development 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. In addition according to Diacon and Carter (2003), every insurance company undertakes the

following essential activities: Generating new business, paying claims, maintaining fund, investing the fund to earn investment income, buying reinsurance, underwriting, paying taxes, deciding a price, provide additional services, drawing up accounts.

Even if there are numerous type of insurances it can be divide in to two broad categories based on their role to the economy. Those are general insurance companies and life insurance companies. : **a) General insurance business** - This is a contract between an insurer and the insured where by the insurer undertakes to indemnify the assured against losses, which may result from the occurrence of specified events within specified periods. General insurance business can be subdivided into: motor, fire, accident, oil and gas, contractors' all risks and engineering risks; marine and credit insurance, bond and surety ship etc. This is a contract between the assurer and the assured whereby the assurer undertakes to pay benefits to the policy holder on the attainment of a specified event. **b) Life assurance business-** comprises individual life business, group life insurance and pension business, health insurance business and annuities.

2.2.3 The Concept of Insurance Profitability

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 is very important determinants of performance (Malik, 2011). Profitability ratios are an indicator for the firm's overall efficiency (Kabajeh and et al 2012). It's usually used as a measure for earnings generated by the company during a period of time based on its level of sales, assets, capital employed, net worth and earnings per share. Profitability ratios measures earning capacity of the firm, and it is considered as an indicator for its growth, success and control. Accordingly, the term 'profitability' is a relative measure where profit is expressed as a ratio, generally as a percentage.

According to Kabajeh and et al (2012) there are different ways to measure profitability such as:

Return on assets (ROA) ratio, Return on owner's equity (ROE) ratio and return on investment (ROI). ROA ratio is calculated as net profit after tax divided by the total assets. This ratio measure for the operating efficiency for the company based on the firm's generated profits from its total assets whereas ROE ratio is calculated as net profit after tax divided by the total shareholders' equity. This ratio measures the shareholders rate of return on their investment in the company. Activity ratios are another group of ratios; it's usually used to measure the ability to optimize the use of the available resources. These ratios are other measures of operational efficiency and performance. Among this group of ratios

is the turnover to capital employed or return on investment (ROI) ratio. ROI ratio is calculated as net profit after tax divided by the total paid in capital. It measures the firm's efficiency in utilizing invested capital. In other words this ratio expresses company's ability to generate the required return (expected return) based in using and managing the invested resources by the shareholders. Kabajeh and et al (2012) also suggest that ROA and ROE are the most used profitability ratios in the analysis.

Al-Shami (2008) similarly argued that ROA, return on equity (ROE) and return on invested capital (ROIC) are measurement of profitability. 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. Hardwick and Adams (1999) and Malik (2011) are among others, who have suggested that although there are different ways to measure profitability it is better to use ROA.

2.2.4 Profitability Related Theories

There is no universal theory on the determinants of insurance companies' profitability. Because of this, this study tries to view some theories which are nearer to the concept of insurance profitability and its determinants.

2.2.4.1 Modern Portfolio Theory

Modern portfolio theory was developed by Harry Markowitz in 1952. This theory suggested that insurance firms are investments by themselves its standard practice for them to invest in a diversified portfolio to minimize risk and harness the returns of the various investment options on offer. When choosing a portfolio investors should maximize the discounted (or capitalized) value of future returns. Since the future is not known with certainty, it must be expected or anticipated returns which are discounted. Through combining different assets whose returns are not perfectly positively correlated, MPT seeks to reduce the total variance of the portfolio return. MPT also assumes that investors are rational and the markets are efficient.

MPT emphasizes maximizing returns while minimizing risks, while giving recognition to the existence of systematic and non-systematic risks. These concepts are usually referred to when discussing financial investments. Insurance being influenced by risks and returns as well, also finds meaning through MPT. Diversification is the solution against being a victim of concentration risk. Over-reliance on similar assets' profitability and hopes that contingent liabilities do not become actual obligations are risks that can wipe-out risk portfolios in an instant. Non-systematic risks and alphas are the main items that give underwriting skills meaning. Non-systematic risks can be eliminated by widening the coverage of

insurance over more assureds. In doing so, diversification is achieved. Alphas, on the other hand, represent the surprise return or inherent profitability of an asset and in converting this concept onto the insurance industry, this is perhaps the inherent characteristics of an insured property and how the hazards and other circumstances are minimized, wherein it is more probable that the premiums paid by the assured will eventually be kept at the end of the insurance policy coverage period. While financial assets are capable of delivering abnormal returns, insurable risks are also able to remain abnormally intact and avoid transforming into real obligations for the insurance company. The fewer obligations an insurance company has, the more the profit they have.

2.2.4.2 Arbitrage Pricing Theory

Arbitrage Pricing Theory (APT) was proposed by Stephen Ross in 1976. APT agrees that though many different specific forces can influence the return of any individual firm, these particular effects tend to cancel out in large and well diversified portfolio. This is the principle of diversification and it has an influence in the field of insurance. An insurance company has no way of knowing whether any particular individual will become sick or will be involved in an accident, but the company is able to accurately predict its losses on a large pool of such risk. However, an insurance company is not entirely free of risk simply because it insures a large number of individuals. Natural disaster or changes in health care can have major influences on insurance losses by simultaneously affecting many claimants.

Cummins (1994) states that insurance companies are corporations and insurance policies can be interpreted as specific types of financial instrument or contingent claim thus it is natural to apply financial models to insurance pricing. The models are designed to estimate the insurance prices that would pertain in a competitive market. Charging a price at least as high as the competitive price (reservation price) increases the market value of the company. Charging a lower price would reduce the company's market value. Thus, financial models and financial prices are among the key items of information that insurers should have at their disposal when making financial decisions about tariff schedules, reinsurance contract terms, etc.

2.2.4.3 Pecking order theory

Pecking order refers to a hierarchy of financing beginning with retained earnings followed by debt financing and finally external equity financing. The theory basically suggests that companies with high

profitability may use less debt than other companies because they have less need to raise funds externally and because debt is the 'cheapest' and most 'attractive' external option when compared to other methods of capital raising (Kaguri, 2013). Donaldson followed by Myers suggests that management follows a preference ordering when it comes to financing.

First, internal financing of investment opportunities is preferred because it avoids the outside scrutiny of suppliers of capital and also there no floatation costs associated with the use of retained earnings. Secondly, straight debt is preferred. Not only does debt result in less intrusion in management by suppliers of capital, but floatation costs are less than with other types of external financing. Also asymmetric information and financial signaling considerations come into play. The third in order of preference is preferred stock, which carries some features of debt. This is followed by various hybrid securities such as convertible bonds. Finally the least desirable security to issue is straight equity. The investors are the most intrusive, floatation costs are highest and there's likelihood to be an adverse signaling effect (Kaguri, 2013).

2.2.4.4 Dynamic theory

The dynamic theory of profit was developed by J.B Clark, according to this theory profit accrues because the society is dynamic in nature. When a society is said to be dynamic when there is a change in its population, change in peoples life trend, change in stock of capital ,change in the supply of entrepreneurs etc .since this dynamic nature of the society make future uncertain and any act result of this has to come in future, involves risk. Thus profit is the price of risk taking and risk bearing. it arises only in a dynamic society which means a society where changes doesn't occur or static by nature the risk element disappear and the profit element does not exist at.

According Clark, profit is the result of an adjustment, which is brought about by the entrepreneurs themselves. In a dynamic economy, if an entrepreneur produces a new thing and creates demand for this product, then he is likely to obtain big profit. But the profit of the entrepreneurs cannot continue to exist for long period. Other entrepreneurs also adopt the innovation and produce similar product this will increase the total output as a result the profit gradually decreases. Thus, we find that the perpetual profit are the result of perpetual new successful innovation. Though, this theory is criticized by ignoring the future uncertainty.

2.3 Determinants of Insurance Companies Profitability: Empirical Evidences

While there have been many studies aimed at the determinants of insurance companies profitability in developed countries, there are few that focus on developing countries of Africa, and indeed none in Ethiopia. To do so, it is better to see what factors were considered in previous times by different individuals in different countries.

The study conducted in Albania by Edlira Luçi et al, (2016) in the title of Assessment of Insurance Companies Profitability: case of Albania. The objective of this paper was to assess the impact of internal factors like growth rate, liquidity, liability, fixed assets, company size and volume of capital, on the profitability of insurance companies in Albania. The purpose of the study was to provide a useful tool for the insurance companies operating in Albania. The researches took insurance companies during the period 2008- 2013. The methodology used to achieve the paper's objective is based on the multiple regression tools with panel data. The results of the multiple regression indicated that there was a statistically significant relationship between growth rate, liquidity, liabilities and fixed assets to the profitability of insurers, while the impact of factors of company size and the volume of capital was not statistically significant.

The other study that is conducted in this subject area is by Pervan (2014) investigated how insurance companies in Macedonia performed and according to the findings of panel analysis regarding the determinants of profitability, it was revealed that expense ratio, claim ratio, Size of the insurer, economic growth (GDP), and inflation have statistically significant influence on insurers' performance. Expense as well as Claims ratios (CR) have negative and statistically significant influence on insurers' profitability while size has a positive influence on the insurers' profitability. GDP growth positively affects insurers profitability i.e. growth of overall economic activity encourage demand for insurers services and indirectly result in higher insurers income while Inflation on profitability is statistically significant and negative, suggesting that higher levels of inflation cause higher interest rates and lower bond prices which in turn reduce portfolio returns.

Chen-Ying Lee (2014) conducted a research by the title of "The Effects of Firm Specific Factors and Macroeconomics on Profitability of Property – liability Insurance Industry in Taiwan" The article investigates the relationship between firm specific factors and macroeconomics on profitability in Taiwanese property-liability insurance industry using the panel data over the 1999 through 2009 time period. Using operating ratio and return on assets (ROA) for the two kinds of profitability indicators to measure insurers' profitability. The results show that underwriting risk, reinsurance usage, input cost,

return on investment (ROI) and financial holding group have significant influence on profitability in both operating ratio and ROA models.

Charumathi B. (2012) conducted a research on the Indian Insurance companies by the title of “Determinants of Profitability of Indian Life Insurers” the study tried to model the factors determining the profitability of life insurers operating in India taking return on asset as dependent variable. The researcher took all the 23 Indian life insurers (including 1 public and 22 private) operating at that time and it used the data pertaining to 3 financial years, viz. 2008-09, 2009-10 and 2010-11. The study examines profitability only with internal or firm specific characteristics such as leverage, size; premium growth, liquidity, underwriting risk and equity capital are regressed against Return on Assets. Finally, the study concludes profitability of life insurers is positively and significantly influenced by the size and liquidity. The leverage, premium growth and logarithm of equity capital have negatively and significantly influenced the profitability of Indian life insurers. The study does not find any evidence for the relationship between underwriting risk and profitability.

Hifza Malik (2011) conducted a research in the title “Determinants of profitability on Insurance Sector of Pakistan” in this study the researcher took a sample of 35 listed life and nonlife insurance companies and also covers the time period from 2005-2009. The study used entirely secondary data. Finally, the finding shows that Age of the company doesn't have relationship with its profitability but size of the company, volume of capital; loss ratio and leverage ratio have a significant relationship with insurance companies' profitability.

Nikhel B. et al. (2015) conducted a research by the title of “Factors Determining Financial Performance of Indian Life Insurance Companies” the study took 10 fully operating life insurance companies in India, the researchers collected 10 years data from 2003/2004 to 2012/2013, the linear regression model was applied in order to get the relationship between ROE that taken as a profit measure and independent variables like underwriting risk, liquidity, leverage, volume of capital, tangibility and size. The findings of the study revealed that there is negative significant relationship between volume of capital and leverage with financial performance (ROE) and there is insignificant positive relationship of tangibility and liquidity with financial performance (ROE).

Andres & Stephen (2013) conducted a research by the title of “Determinants of Profitability in Life Insurance Companies: Evidence from the Philippines “ This paper examines the profitability of the Philippine life insurance industry using pooled ordinary least squares on a balanced panel of 23 insurance companies for the years 2000-2012. The analysis makes use of Return on Assets (ROA) as a measure of

profitability that is influenced by selected firm level, industry level and macroeconomic factors. The empirical results show that most of the firm level factors influenced ROA while industry level and macroeconomic factors have negligible effect on it. Specifically profitability of Philippine life insurance companies is negatively correlated with liquidity, leverage, number of locations and firm size. GDP and inflation were shown to have no statistically significant effects on profitability.

Mirie M. & Jane W (2015) conducted a research by the title of “Determinates of Financial Performance in General Insurance Companies in Kenya” The main objective of the study was to establish the factors that affect the profitability of general insurers in Kenya. The study employed multiple linear regressions, with return on assets as the dependent variable, and considered all the general insurance companies in Kenya for the period 2009-2012. Finally the study reveals Profitability was positively related to leverage, equity capital, management competence index and negatively related to size and ownership structure. The study did not find a relationship between performance and retention ratio, liquidity, underwriting risk and age.

Erick k. Et al. (2011) conducted a research in Ghana by the title of “determinants of the profitability of insurance firms in Ghana” The general objective of the study was to find out the determinants of the profitability of insurance firms in Ghana. Secondary data on financial reports were collected from sixteen insurance firms in Ghana for the period 2005 to 2010. The study was quantitative in nature. The study discovered that, apart from tangibility which has a negative relationship, there is a positive relationship between leverage, liquidity and profitability of insurance firms in Ghana.

Borome Joseph (2013), conducted a research in the title of “Determinants of Financial Performance for Life Insurance Companies in Kenya” The objective of this study was to determine the factors that affect the financial performance of life insurance companies in Kenya. The researcher selected Solvency Margin, Growth of Premiums, Insurance Financial Leverage, Investment Ratio, Diversification, Company Size, and Retention Ratio as a variable. The study employed multiple linear regression analysis with data for 24 life insurers that were operating in Kenya for the respective five year period 2010 - 2014. The study found that Diversification and Investment ratio showed a strong positive relationship to financial performance while Insurance Financial Leverage showed a moderate positive relationship to Financial Performance of life insurance companies in Kenya. Retention ratio showed a strong negative relationship to financial performance. Company Size and Growth of Premiums showed a weak negative relationship to financial performance while Solvency Margin showed a weak positive relationship to Financial Performance of life insurance companies in Kenya.

2.3.1 Empirical Evidences From Ethiopia

In our countries, the importance of the insurance industry as an essential component of the financial system it is not fairly appreciated. In this context, Mehari and Aemiro (2013) assess the impact of the Ethiopian insurance companies' characteristics on their performance. The study includes nine insurance companies which are analyzed through panel data technique, during 2005– 2010. According to the results, company size, loss ratio, tangibility and leverage represent important determinants of insurers' performance, while growth of gross written premiums, age and liquidity have an insignificant statistical power.

Abate and Yuveraj (2013) insurers' profitability is determined by growth, leverage, and volume of capital, size, and liquidity hence growth, size, and volume of capital are positively related. In contrast, liquidity ratio and leverage ratio are negatively but significantly related with profitability. The age of companies and tangibility of assets are not significantly related with profitability.

The other study conducted in Ethiopian level is "Determinants of Insurance Companies' Profitability in Ethiopia" by Meaza Melese in the year of 2014. This paper examined the effects of firm specific factors like (size of company, leverage ratio, liquidity ratio, loss ratio/ risk, tangibility of assets, growth and managerial efficiency) and macroeconomic factors (economic growth and inflation) on profitability proxied by ROA. The sample in this study includes ten insurance companies for six years (2008-2013). From the regression result; size, leverage, tangibility of asset, loss ratio/ risk, firm growth and managerial efficiency are identified as significant determinants of profitability hence firm size, tangibility of asset, firm growth and, managerial efficiency are positively related. In contrast, leverage and loss ratio/ risk are negatively but significantly related with profitability. Liquidity, inflation, and economic growth.

Suheyli Reshid conducted a study by the title "the Determinants of insurance companies profitability in Ethiopia" the researcher used eleven years data from 2004-2014 and analyzed nine insurance companies. The finding showed that underwriting risk, technical provision and solvency ratio have significant negative relationship and liquidity, company size and premium growth have positive significant relationship with profitably.

In the year 2016 Asrat and Tesfahun (2016) tried to determine the basic variables that varies profitability of Ethiopian insurance companies they used 8 insurance companies by using non probability judgmental sampling. The study tried to test the effect of both firm specific and macroeconomic variables. The fixed effect panel data model regression analysis shows that private insurers' profitability is statistically

significantly affected by firm specific factor which is underwriting risk negatively, company size positively, premium growth positively, and solvency ratio negatively and reinsurance dependency has no influence on profitability and statistically insignificant. The macroeconomic variable economic growth rate has significant influence on profitability and inflation has insignificant influence on insurers' profitability whereas interest rate which measured by time deposit weighted average was insignificant variable.

2.4 Determinants of Insurance Companies Profitability

Insurance company profitability is influenced by both internal and external factors. Whereas internal factors focus on an insurer's specific characteristic, the external factors concern both industry features and macroeconomic variables. However, in most literatures, profitability with regard to insurance companies frequently expressed in as a function of internal determinants. Besides internal determinants, in this research the researcher will included a set of macroeconomic determinants.

The relevant literature may be categorized as: the effects of firm specific factors on profitability and the effects of macroeconomics factors on profitability. The following are the variables used in the researches concerning profitability of insurance companies in Ethiopia.

2.4.1 Company Specific Determinants (Internal factors)

The internal determinants of insurance company's profitability are those management controllable factors which account for the inter-firm differences in profitability, given the external environment.

Company Age (AGE):-The age of the company is one of the most influential characteristics in organizational studies. Newly established insurance are not particularly profitable in their first years of operation, as they place greater emphasis on increasing their market share, rather than on improving profitability Athanoglou et al., (2005). Similarly, Yuqi li (2007) 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.

Age of company (measured as the number of years a company is operating in the market since it was founded) is an important determinant of financial performance.

Leverage: -This is measured by ratio of total debt to equity (debt/equity ratio). This ratio shows the degree to which a business is utilizing borrowed money. It reflects insurance companies' ability to manage their economic exposure to unexpected losses (Adam & Buckle, 2000).

$$\text{Leverage ratio} = \frac{\text{Total Debt}}{\text{Total Stockholders' equity}}$$

Liquidity: -This refers to the degree to which debt obligations coming due in the next twelve months can be paid from cash or assets that will be turned in to cash. Insurance liquidity is the ability of the insurer to fulfill their immediate commitments to policyholders without having to increase profits on underwriting and investment activities and/or liquidate financial assets

$$\text{Liquidity ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Premium growth: -Premium revenue is the primary source of revenue for most insurers, and it is generally more persistent than other revenue sources. Therefore, premium growth should help predict future revenue and earnings growth. Premium growth also measures the rate of market penetration. (Kim et al. 1995). Proxy for premium growth is the percentage increase in gross written premiums (GWP). The equation is expressed as:

$$\text{PG} = (\text{GWP} (t) - \text{GWP} (t-1)) / \text{GWP} (t-1).$$

Underwriting risk: -The other factor determining financial performance is underwriting risk which reflects the adequacy and efficiency of the insurers' underwriting performance. Sound underwriting guidelines are pivotal to an insurer's financial performance. The underwriting risk depends on the risk appetite of the insurers. It is measured through the claim incurred divided by annual premium earned. (Adams & Buckle, 2000).

Tangibility of Asset

The tangibility of Assets (TAN): It is a ratio that measures the share of Fixed Assets from Total Assets.

$$\text{TAN} = \text{Fixed Assets} / \text{Total Assets}.$$

2.4.2 External Factors/ Macroeconomic Factors /

Those factors which are beyond the management's control are referred as external or macroeconomic factors and these factors are related to the industry and macroeconomic factors. The external determinants are variables that are not related to insurance management but reflect the economic and legal environment that affects the operation and performance of financial institutions. According to (Deepak & Abebaw, 2011), the external factors, they have a relatively small impact on the profitability of Ethiopian insurance companies.

Market Share: –is measured by dividing the total asset of each firm with the total asset of the industry in general (Teklit & asmindeep, 2016). In this research market share is calculated by dividing each insurance company's gross premium with the total gross premium of the industry because, market share is best explained by the percentage of sales that is shared by the entity from the industry (Behailu, 2017).

$$\text{Market share} = \frac{\text{Gross premium of each firm}}{\text{Gross premium of industry}}$$

Growth rate of GDP: -GDP is the indicator of economic development in one's country (state). One's country GDP may growth as such in the level of economic activities this growth of GDP leads the total value of goods and services produced in one year.

$$\text{Growth Rates of GDP} = \frac{(\text{GDP}(t) - \text{GDP}(t - 1))}{\text{GDP}(t-1)}$$

Inflation: -Inflation is a general rise in the prices of goods and services in a particular country; specifically it leads to a fall in the value of money. If one's country inflation rate in significantly increased the total goods and services of the country is also significantly fall (Suheyli, 2015).

$$\text{Inflation rates} = \frac{(\text{I}(t) - \text{I}(t - 1))}{\text{I}(t-1)}$$

2.4.3 Conclusion and Knowledge Gap

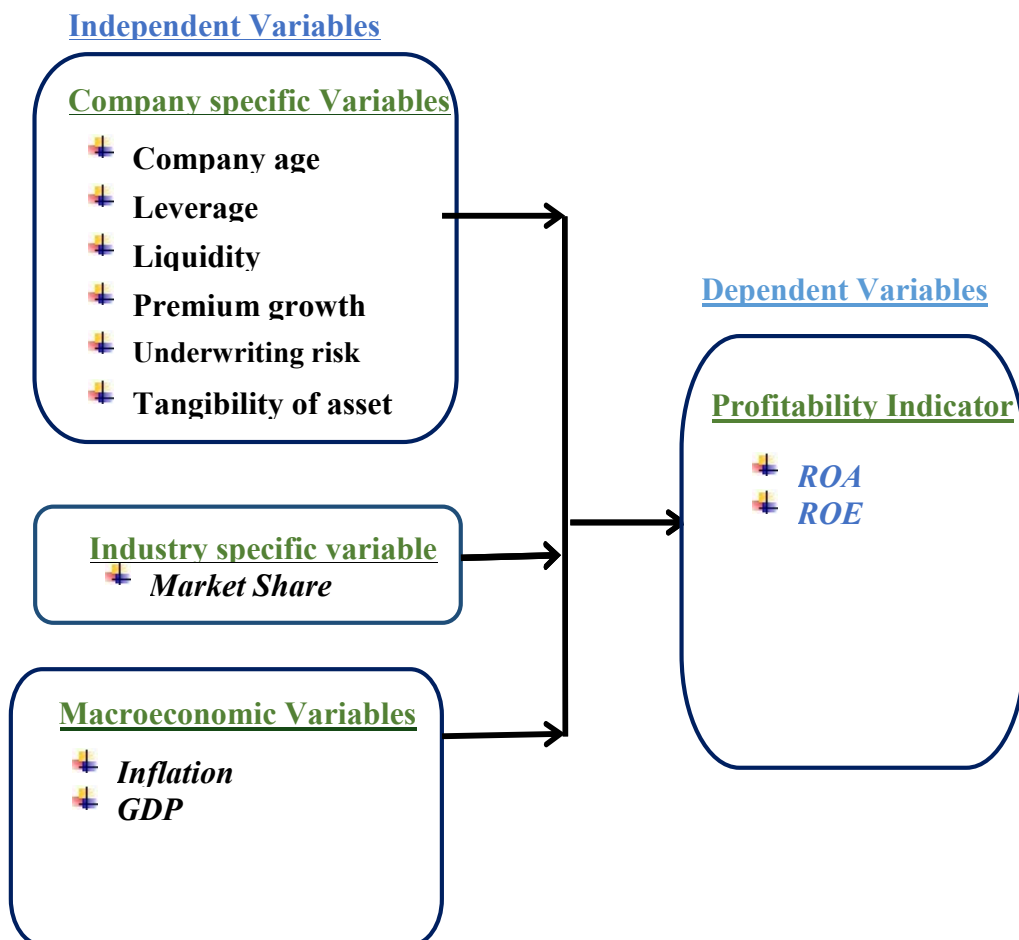
As clearly shown above in the Empirical review part measurement of financial industry's profitability has attracted scholarly attention in recent studies and there have been a growing number of studies recent years that test for measures and determinants of insurance companies' profitability. Meaza Melese (2014) , Mirie M. & Jane W (2015), Charumathi B. (2012), Nikhel B. et al. (2015), EdliraLuçi et al, (2016), Andres & Stephen (2013) , Erick k. Et al. (2011) Suheyli Reshid (2015), Abate and Yuveraj (2013) and Hifzaa Malik (2011) are some of researchers who conduct study about the determinants of insurance companies profitability. Even though, many study are the results found by the researchers mentioned above in the empirical revealed inconsistencies according to the country and the type of insurance company in which the research is conducted and regarding selected variables.

Moreover, as it can see in empirical evidences, most literatures are done in outside Ethiopia. Even though few studies conducted in this title in Ethiopian context they concerned in profitability of banks rather than insurance companies. Therefore, there are fewer literatures concerning insurance companies as compared to banks and most of them focus on firm specific factors. According to the knowledge of the researcher there are only few researches which considered the effects of macroeconomic factors on the profitability of insurance companies such as Meaza (2014) and Mistre (2015), Suheyli (2015) and Asrat and Tesfahun (2016) this shows it has received little attention. Accordingly, this research includes firm specific, industry specific and macroeconomic factors and takes recent data from 15 years financial statements of Ethiopian insurance companies'. This study will add literature on the determinants' of profitability of insurance companies in Ethiopia.

2.5 Conceptual Framework

General insurers' profitability is influenced by both internal and external factors. Whereas internal factors focus on insurers specific characteristics, the external factors concern both industry features and macroeconomic variables. This study used both internal and external determinants of insurance's profitability by including company age, leverage, liquidity, premium growth, underwriting risk, tangibility of asset, market share, growth rate of GDP and inflation. The study identified how these variables determine the profitability of insurance company in Ethiopia.

Figure 1. Conceptual Framework



Source:-Developed by the researcher

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Research Approach

This section discusses the research methodology that applied for the study. The methodology of this research constructed based on the objectives of the study. In line with the objective of the study the researcher used quantitative research approach. Quantitative research is a means for testing objective theories by examining the relationship among variables (Creswell, 2009). And according to Kothari (2004) quantitative research is based on the measurement of quantity or amount. It is applicable to phenomena that can be expressed in terms of quantity.

3.2 Research Design

In order to show the casual relationship of the variables the researcher used explanatory research design. If the objective is to determine which variable might be causing a certain behavior, i.e. whether there is a cause and effect relationship between variables, explanatory research must be undertaken (Shields, 2013).

3.3 Sources and Types of Data

In order to carry out any research activity; information should be gathered from proper sources. According to Yugi (2006), secondary data has its own advantages. Compared to primary data, secondary data gives higher quality data, the feasibility to conduct longitudinal studies 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 may be checked relatively easily by others. Therefore, to increase the dependability of the data, the study uses secondary data which is based on the audited annual financial statement of the insurances companies which are readily available on their website and archives as well as the macroeconomic data was collected from National Bank of Ethiopia annual reports, and other published and unpublished documents.

3.4 Data Collection Instruments

In the data collection process different data collection instruments can be used. According to the source of data that have to be collected to conduct the study, the researchers used secondary data by reviewing the annual audited financial statements of Ethiopian insurance companies from year 2003 to 2017. On the other hand, in order to analyze the relationship that exists between profitability and macro-economic variables, macroeconomic data are gathered from the records held by NBE and MoFEC through structured document review.

3.5 Population and Sampling Techniques

The target populations of the study are all insurance companies registered by NBE and under operation in Ethiopia. Currently, seventeen insurance companies are working in Ethiopia. As they are already few in numbers and in order to minimize a sampling risk there is no need to sample from the seventeen insurance companies, But, because of lack of 15 years data in most of the newly established insurance companies, the number of sample is reduced to nine. Besides, fifteen years is assumed to be relevant because five years and above is the recommended length of data to use in most finance literatures. According to Singh, (2006) when the subjects used in the sample is homogeneous, using purposive sampling technique is appropriate. Therefore, the researcher used purposive sampling method to draw the sample from the population.

Table 1: List of sample Insurance Companies used in this research

| NO. | NAME OF INSURANCE | ESTABLISHED DATE | OWENERSHIP |
|------------|--------------------------|-------------------------|-------------------|
| 1 | Ethiopian Insurance com. | 1/14/1976 | Gov't |
| 2 | Awash Insurance com. | 1/10/1994 | Private |
| 3 | Africa Insurance com. | 1/12/1994 | Private |
| 4 | Nyala Insurance com. | 6/1/1995 | Private |
| 5 | Nile Insurance com. | 11/4/1995 | Private |
| 6 | NICE | 23/9/1994 | Private |
| 7 | United Insurance com. | 1/4/1997 | Private |
| 8 | Global Insurance com. | 11/1/1997 | Private |
| 9 | Nib Insurance com. | 1/5/2002 | Private |

Source: Developed by the researcher.

3.6 Method of Data Analysis

Once the data is collected, it is analyzed by using descriptive statistics, correlations analysis and multiple linear regression analysis. Mean values and standard deviations are used to analyze the general trends of the data from 2003 to 2017 based on the sector sample of 9 insurance companies and a correlation matrix is also used to examine the relationship between the dependent variable and explanatory variables. In addition, ordinary least square (OLS) is conducted using statistical package “EViews -8” to determine the most significant and influential explanatory variables affecting the profitability of the insurance industry in Ethiopia.

3.7 Hypotheses of the Study

Based on review of relevant and related literatures, it is hypothesized that company age, liquidity ratio, leverage ratio, premium ratio, underwriter risk, tangibility of asset, market share, GDP and inflation are expected to influence firms' profitability as measured by Return on Assets (ROA) and Return on Equity(ROE). Accordingly, the following hypotheses were formulated in this study:

1. Company Age

Several studies have been conducted to examine the effect of age on firm profitability and it has been suggested that company age is positively related to profitability. However, the empirical evidences of the linkage between profitability and firm ages 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. Jay Angoff Roger Brown (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 Re (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 Ahamed Ali Al-Shami (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 age and profitability. Similarly, Hifza Malik (2011) in his Pakistan study found that there is significantly positive association between age 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.

H1. Company Age has a positive and significant impact on profitability of insurance companies in Ethiopia.

2. 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. Insurance leverage could be defined as reserves to surplus or debt to equity.

As far as **leverage ratio** is concerned most of the studies conducted in this area come up with similar conclusion; for instance Hifzaa (2011), Suheyli (2015), Meaza (2014), Charumathi B. (2012), Mirie M. & Jane W (2015), Andres & Stephen (2013) and Nikhel B. et al. (2015) showed leverage ratio is negatively related to profitability which means when the company is more financed with debt than equity the profit of the firm will decline. On the other hand Erick et al. (2011) and Behaylu (2017) come up with different conclusion with the other studies; they concluded leverage ratio and profitability of the firm have a positive relationship.

H2.Leverage ratio has a negative and significant effect on profitability of Ethiopian insurance companies.

3. Liquidity shows the ability to convert an asset to cash quickly and reflects the ability of the firm to manage working capital when kept at normal levels. Maintaining high liquidity can reduce management's discipline as regards both underwriting and investment operations. Moreover, according to the theory of agency costs, high liquidity of assets could increase agency costs for owners because managers might take advantage of the benefits of liquid assets (Adams and Buckle, 2000). In addition, liquid assets imply high reinvestment risk since the proceeds from liquid assets would have to be reinvested after a relatively short period of time. Undoubtedly, reinvestment risk would put a strain on

the performance of a company. In this case, it is, therefore, likely that insurance companies with less liquid assets outperform those with more liquid assets.

With regard to **liquidity ratio**, the study conducted by Suheyli (2015), Meaza (2014), Abate and Yuveraj (2013), Edlira et al, (2016), Abate (2013) and Andres & Stephen (2013) concluded liquidity of insurance companies have a negative significant relationship with their profitability. In the contrary to this findings Erick k. Et al. (2011), Behaylu (2017) and Charumathi B. (2012), showed liquidity ratio have a positive relationship with profitability this means when the liquidity of the firm improved the profitability will also improve. On the other hand the study conducted in Kenya by Mirie M. & Jane W (2015), and the study conducted in India by Nikhel B. et al. (2015) showed liquidity ratio and the profitability of the firm have no statistically significant relationship at all.

H3. Liquidity ratio has a negative and significant impact on profitability of insurance companies in Ethiopia.

4. Premium growth

Premium growth measures the rate of market penetration. Empirical results showed that the rapid growth of premium volume is one of the causal factors of insurers' insolvency (Kim et al. 1995). the primary motivation for using premium growth as a potential early warning signal of financial impairment. In contrast, premium growth attributable to rate increases may reduce risk if the same customers are paying more for the same risk exposure. However, if the rate increases alter or reflect a change in the mix of customers, the new book of business can generate unexpected losses if it is mispriced.

With regard to **Premium growth**, the study conducted by Suheyli (2015), Asrat & Tegegn (2016) find out that premium growth of insurance companies have a positive significant relationship with insurance companies profitability. In contrast the study conducted by B. Charumathi (2012), conducting empirical study on 23 Indian life insurance companies by taking 3 years data concluded premium growth of insurance companies have a negative significant relationship with their profitability. In addition Kalkidan (2017), find out similar results with B. Charumathi.

H4. Premium growth has a positive and significant effect on profitability of Ethiopian insurance companies.

5. Underwriting risk

Underwriting risk is the risk that the premiums collected will not be sufficient to cover the cost of coverage. Insurance prices are established based on estimates of expected claim costs and the costs to issue and administer the policy. Insurers that undertake risky business and the diversification of underwriting risks help to mitigate exposure to underwriting losses and improve operational profits. Lower anticipated losses may lead to better performance because the monitoring and claims handling costs are low. (Adams, M & M. Buckle, 2003).

Chen-Ying Lee (2014) argued that underwriting risks have significant influence on firm profitability. The study conducted by B. Charumathi (2012) in Indian life insurance industry does not find any evidence for the relationship between underwriting risk and profitability.

H5. Underwriting risk has a negative and significant impact on profitability of insurance companies in Ethiopia.

6. Tangibility of Asset

Tangibility of assets ratio measures the share of fixed assets from total assets, this allows the firm to get a borrowing access easily, and it is due to serving as collateral to get sufficient loan. Asnakew (2011) Tangible assets are likely to have an impact on the borrowing decisions of a firm because they are less subject to informational asymmetries and usually have a greater value than intangible assets in case of bankruptcy. Therefore, it is considered that the availability of such borrowing capacity will impact on the profitability of the insurance companies.

A recent study by Naveed Ahmed et.al... (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, size, profitability, 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 22 determinant of performance of life insurance sector whereas ROA has statistically more of insignificant relationship with, tangibility of assets. However, Hifza Malik (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 is. In contrast to this, Yuqi Li (2007) in UK found no significant relationship between tangibility of assets and profitability of insurance companies.

H6. Tangibility of asset has positive and significant impact on the profitability of insurance companies in Ethiopia.

7. Market Share

The industry specific factor which is market share studied by (Gale, 1972) finds out that bigger market share is positively related to lower operating ratio, which coincides with the proposal of that high market share might result in high profit, mainly because high market share boosts a firm's market advantage and its ability to set prices, which helps the firm to boost profit and achieve economies of scale. Chen-Ying Lee (2014) investigates the relationship between firm specific factors and macroeconomics on profitability in Taiwanese property-liability insurance industry using the panel data over the 1999 through 2009 time period. Using operating ratio and return on assets (ROA) for the two kinds of profitability indicators to measure insurers' profitability. The results show that market share has positively significant influence on profitability. In contrast the study by Teklit & Jasmindeep (2016) and Behaylu (2017) both of the studies concluded market share doesn't have a significant effect on the profitability of insurance companies

H7. Market share has a positive and significant impact on profitability of insurance companies in Ethiopia.

8. Inflation

Inflation is taken into account when actuaries set actuarially fair premiums, inflation itself is unlikely to seriously impact on the performance of insurance companies. Nevertheless, if inflation is significantly greater than expected, it could cause insurance companies financial difficulty. For instance, unexpected inflation makes real returns on fixed-rate bonds lower than expected. As a consequence, profit margins of insurance companies are compressed and financial performance is accordingly impaired (Browne, Carson & Hoyt, 1999). The inflation could affect insurance companies' profitability influencing both their liabilities and assets. According to Meaza (2014), Teklit & Jasmindeep (2016), Asrat and Tesfahun (2016), Andres & Stephen (2017) and Behaylu (2017)

inflation have no significant relationship with profitability of insurance companies. Study conducted by Redwan (2017) shows that inflation has indirect and significant relation with profitability.

H8. Inflation has negative and significant impact on profitability of insurance companies in Ethiopia.

9. Economic growth (GDP)

As far as economic growth is concerned several studies tried to measure its influence on the insurance companies profitability for instance, Meaza (2014), Teklit & Jasmindeep (2016) showed GDP haven't have a significant relationship with profitability. But studies conducted by Kalkidan (2016), Behaylu (2017) and Andres & Stephen (2013) concluded GDP has a negative significant influence on the performance of insurance companies, which means as the rate of GDP increases profitability of insurance companies will decrease. In the contrary to this findings Kazimierz (2016) and Asrat and Tesfahun (2016) showed GDP has a positive impact on profitability of the firm, which means as GDP increase profitability of insurance companies will also increase.

H9. Economic growth has positive and significant impact on profitability of insurance companies in Ethiopia.

3.7.1 Operationalization of the Study Variables

This section presents the measurements that were used to operationalize the study variables.

Table 2. Description of the variables and their expected relationship with profitability.

| Variables | | Measurement | Expected Sign |
|-------------|----------------------|---|---------------|
| Dependent | ROA | Net Profit before tax/ Total assets | NA |
| | ROE | Net Profit before tax/ Total Share holders' equity | NA |
| Independent | Company Age | Number of Years since the company start operation | + |
| | Leverage | Total Debt /Total Share holders' Equity | - |
| | Liquidity | Current Assets / Current Liabilities | - |
| | Premium Growth | $(GWP(t)-GWP(t-1)) / GWP (t-1)$ | + |
| | Underwriting Risk | Claim incurred / Annual premium earned | - |
| | Tangibility of Asset | Fixed asset/ Total asset | + |
| | Market Share | $\frac{\text{Gross premium of each firm}}{\text{Gross premium industry}}$ | + |
| | Inflation | $(I(t) - I(t-1)) / I(t-1)$ | - |
| | Economic growth(GDP) | $(GDP(t) - GDP(t-1)) / GDP(t-1)$ | + |

Source: Developed by the researcher

3.8 Model Specification

The researcher formulates the econometric model which are a representation of the basic features of an economic phenomenon so as to achieve the broad research objective. It is an abstraction of the real world. The specification of a model is based on the available information relevant to the study in question. This is to say, the formulation of an economic model is dependent on available information on the study as embedded in standard theories and other major empirical works, or else, the model would be theoretical. In order to determine the dynamic and simultaneous inter-relationship between banking industry profitability and its determinants, an empirical model used by (Davydenko , 2010).

According to William (2010), model building involves specifying relationships between two or more variables; perhaps extending to the development of descriptive or predictive equations. In order to achieve the objectives of this research study, the panel data regression model is used to identify the relationship between the profitability of insurance companies and explanatory variables like company age, underwriting risk, leverage ratio, liquidity ratio, premium growth, tangibility of asset, market share, inflation and growth rate of GDP. This is because prior studies; Malik (2011), Shiu (2004), Charumathi (2012) mostly developed this model to identify the determinant of insurance companies profitability. Thus, the collected panel data is analyzed using descriptive statistics, correlations, multiple linear regression analysis and inferential statistics. Mean values and standard deviations are used to analyze the general trends of the data from 2003 to 2017 based on the sector sample of 9 insurance companies and a correlation matrix is also used to examine the relationship between the dependent variable and explanatory variables. In addition, ordinary least square (OLS) is conducted using statistical package “EViews-8” to determine the most significant and influential explanatory variables affecting the profitability of the insurance industry in Ethiopia.

It is also necessary to determine whether the fixed effect or random effect approach is appropriate. A common practice to make the choice between both approaches by running a Hausman test. To conduct a Hausman test the number of cross section should be greater than the number of coefficients to be estimated. But, in this study the number of cross sections are smaller than the numbers of coefficients so it is not possible to conduct a Hausman test.

In addition, as noted in Gujarati (2004) if the number of time series data is larger than the number of cross-sectional units there is likely to be little difference in the values of the parameters estimated by fixed effect model and random effect model. Hence, the choice here is based on computational convenience. Therefore, fixed effect model may be preferable than random effect model (Gujarati, 2004).

In light of the above, to investigate the effect of insurance-specific and macroeconomic determinants of insurers profitability, the following general multiple regression model is adopted from different studies conducted on the same area.

$$Y_{it} = \alpha + \beta_1 (ISD)_{xt} + \beta_2 (MED)_{yt} + \epsilon_{it}$$

Where;

Y_{it} represents the dependent variables of insurance i for time period t.

α is the intercept

(ISD)_{xt} represent the x-th insurance specific determinants at time t;

(MED)_{yt} represent the y-th macroeconomic determinants at time t ;

ε_{it} is the error term

In this models, all independent variables enter the regression equation at once to examine the relationship between the whole set of predictor and dependent variable. The aim of this analysis is to determine which independent variables are highly significant to determine the company's profitability. The following regression equation is estimated as follow:

- 1) $ROA_{i,t} = \alpha + \beta_1 AGE_{i,t} + \beta_2 LVI_{i,t} + \beta_3 LQ_{i,t} + \beta_4 GPI_{i,t} + \beta_5 URI_{i,t} + \beta_6 TANI_{i,t} + \beta_7 MSi_{i,t} + \beta_8 INF + \beta_9 GDP + \epsilon_{i,t} \dots \dots \dots (1)$
- 2) $ROE_{i,t} = \alpha + \beta_1 AGE_{i,t} + \beta_2 LVI_{i,t} + \beta_3 LQ_{i,t} + \beta_4 GPI_{i,t} + \beta_5 URI_{i,t} + \beta_6 TANI_{i,t} + \beta_7 MSi_{i,t} + \beta_8 INF + \beta_9 GDP + \epsilon_{i,t} \dots \dots \dots (2)$

Source: Developed by the researcher. Table 3 regression equation of the study.

Where:

- **ROAi,t** =Return on Asset of Insurance i at time t
- **ROEi,t** =Return on Equity of Insurance i at time t
- AGE= company Age
- LV=leverage
- LQ= liquidity
- PG = premium growth;
- UR = underwriting risk;
- TAN= Tangibility of Asset;
- MS= market share
- INF = inflation
- GDP = growth rate of GDP
- ϵ =is the error component for company i at time t
- α = Constant
- $\beta_1 \dots \beta_9$ = coefficient of independent variables
- i = Insurance company i = 1 . . . 9; and t = the index of time periods and t = 1 . . . 15

3.9 Diagnostic Analysis

As mentioned in Chris. B (2008), there are basic assumptions required to show that the estimation technique, OLS had a number of desirable properties, and also so that hypothesis tests regarding the coefficient estimates could validly be conducted. If these Classical Linear Regression Model (CLRM) assumptions hold, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators. Therefore, for the purpose of this study, diagnostic tests are performed to ensure whether the assumptions of the CLRM are blue or not in the model. Consequently, the basic CLRM assumptions test in this study are errors have zero mean, homoscedasticity, autocorrelation, multicollinearity and normality. According to Chris. B (2008) when the assumptions are satisfied, it means that all the information available from the patterns was used. But, if there is assumption violation of that data usually means that there is a pattern of data that have not included in the model, and could actually find a model that fits the data better.

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

According to Chris. B (2008), if a constant term is included in the regression equation, this assumption will never be violated. Thus, since the regression model used in this study included a constant term, this assumption will not violate.

3.9.2. Multicollinearity

According to Chris.B (2008), Multicollinearity will occur when some or all of the independent variables are highly correlated with one another. If the multicollinearity occurs, the regression model is unable to tell which independent variables are influencing the dependent variable. The consequences of Multicollinearity are OLS estimators still Best, Linear and Unbiased, large variances and covariance of OLS estimators, wider confidence interval, and insignificant ratio. In this case, this study chooses to use high pair-wise correlation coefficients method because it can see the correlation of independent variables between each other one by one.

There were different arguments towards the multicollinearity problem. (Gujarati D. N., 2004) stated that multicollinearity problems exist when the correlation coefficient among variables greater than 0.80. (Hair JF, 2006) also argued that correlation coefficient below 0.9 may not cause serious multicollinearity problem. In contrary to this, (Kennedy, 2008) argued that as any correlation coefficient above 0.7 could cause a serious multicollinearity problem leading to inefficient estimation and less reliable results.

3.9.3. Autocorrelation

According to Chris.B (2008), when the error term for any observation is related to the error term of other observation, it indicate that autocorrelation problem exist in this model. In the case of autocorrelation problem, the estimated parameters can still remain unbiased and consistent, but it is inefficient. The result of T-test, F-test or the confidence interval will become invalid due to the variances of estimators tend to be underestimated or overestimated. Due to the invalid hypothesis testing, it may lead to misleading results on the significance of parameters in the model. Durban-Watson Test will be used to detect Autocorrelation problem.

H0: There is no autocorrelation problem in the model.

H1: There is autocorrelation problem in the model.

Decision Rule: Reject H_0 if DW-value of the regression is less than d_l and greater than $4-d_l$. But do not reject H_0 if DW value is between d_u and $4-d_u$.

3.9.4. Heteroscedasticity

According to Chris.B (2008), Heteroscedasticity means that error terms do not have a constant variance. If heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid as it will under estimate the variances and standard errors. There are several tests to detect the Heteroscedasticity problem, which are Park Test, Glesjer Test, Breusch-Pagan-Goldfrey Test, White's Test and Autoregressive Conditional Heteroscedasticity (ARCH) test. In this case, this study chooses to use White test to detect Heteroscedasticity.

H_0 : There is No Heteroscedasticity problem in the model.

H_1 : There is Heteroscedasticity problem in the model.

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

3.9.5. Normality

Normality tests are used to determine if a data set is well-modeled by a normal distribution. With the normality assumption, ordinary least square estimation can be easily derived and would be much more valid and straight forward. This study will use Jarque-Bera Test (JB test) to find out whether the error term is normally distributed or not.

H_0 : Error term is normally distributed

H_1 : Error term is not normally distributed

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

Chapter Four

Data Analysis and Interpretation

This chapter deals with the analysis and interpretation of the results of the study. The data were analyzed by using E-views 8 software. The descriptive statistics and the correlation analysis were discussed. Followed by the diagnostic test, which is necessary to fulfill the assumption of the classical linear regression model. Then, econometric analysis and discussion of the main finding of the study were presented. Finally, the results of the regression analysis were discussed by supporting empirical evidence.

4.1. Descriptive Statistics

This section presents the descriptive statistics of dependent and independent variables used in the study for the sample insurance companies. The dependent variables used in the study were ROA and ROE while the independent variables were company age, leverage, liquidity, premium growth, underwriting risk, tangibility of asset, market share, growth rate of GDP and inflation. Thus, the total observation for each dependent and explanatory variables were 135 (panel data of 9 insurance companies for 15 years). The table 4.1 demonstrates the mean, standard deviation, minimum and maximum values for the dependent and independent variables for sample insurance companies over the year 2003 to 2017.

The ROA measured by the net profit before tax divided by total asset has a mean value of 9.21%. This indicates that the sample insurance on average earned net profit before tax of 9.21% of the total asset. Since ROA indicates the efficiency of the management of a company in generating net profit before tax from all the resources of the institutions, the higher ROA shows that the company is more efficient in using its resources. The maximum value of ROA was 32% and minimum value of -10.2%. That means the most profitable and least profitable insurance company among the sampled insurances earned 32 cents and lost 10.2 cents of net income before tax for a single birr invested in the total assets of the firm respectively.

The ROE which is measured by the net profit before tax divided by total shareholders' equity has a mean value of 32.96%. This implies that, the sample insurance on average earned 32.96 cents of each birr

invested in shareholders' equity. Accordingly, during the study period the sample insurance companies in Ethiopia had relatively good performance which is measured by ROE when it's compared with the ROA. The maximum value of ROE was 117% and minimum value of -60%. That means the most profitable and least profitable insurance company among the sampled insurances earned 117 cents and lost 60 cents of net income before tax for a single birr invested in the shareholders' equity of the firm respectively. ROA deviates from the average value both sides by 6.4%, which implies the presence of moderate variations among the values of profitability across the insurance companies when compares with 31.1% of ROE.

Table 4.1: below shows descriptive statistics of Ethiopian insurance companies.

| | ROA | ROE | AGE | LV | CR | GP | UR | TAN | MS | INF | GDP |
|------------------|-----------|-----------|----------|----------|----------|-----------|----------|----------|-----------|----------|-----------|
| Mean | 0.092184 | 0.329605 | 15.88889 | 0.667963 | 1.035049 | 0.456097 | 0.621048 | 0.175596 | 0.104835 | 0.141267 | 0.097467 |
| Median | 0.086765 | 0.282069 | 15.00000 | 0.670151 | 1.020000 | 0.140000 | 0.632700 | 0.150000 | 0.070000 | 0.099000 | 0.104000 |
| Maximum | 0.320000 | 1.170463 | 41.00000 | 0.840000 | 2.600000 | 48.16000 | 0.895200 | 0.540000 | 0.690000 | 0.364000 | 0.126000 |
| Minimum | -0.102274 | -0.600000 | 1.000000 | 0.000000 | 0.000000 | -21.72000 | 0.132200 | 0.000000 | -0.008000 | 0.028000 | -0.021000 |
| Std. Dev. | 0.064299 | 0.311587 | 8.091516 | 0.105495 | 0.328461 | 4.835335 | 0.148991 | 0.112522 | 0.138148 | 0.099004 | 0.033824 |
| Observ | 135 | 135 | 135 | 135 | 135 | 135 | 135 | 135 | 135 | 135 | 135 |

Source: Own estimation via Eviews-8, Descriptive statistics result

Regarding the independent variables, **Company age (AGE)** is one of the most important company specific determinant of profitability which is proxied by number of Years since the company start operation. The maximum and the minimum age of the company were recorded by EIC 41 years and Nib insurance company 1 years respectively. In additions, The mean value of Company age is 15 years & 8 month and the value of standard deviation is 8.09, there are big differences between values of company age because of standard deviation is high at 8.09.

Leverage ratio (LR) shows the long term solvency position of a company and it has a lowest value of 0.00 (this shows that from every 1 br. Of total shareholders' equity noting is financed thorough liability by awash insurance company in 2004. While maximum leverage ratio is 0.84 by EIC (this shows that 84% of the total shareholders' equity of the insurance company are financed through liability or by creditors). On average, insurance companies have leverage ratio of 67%, which means 67% total shareholders' equity are financed through liability. Leverage ratio deviated from the mean is 0.105. This implies that there were large differences among leveraged level as measured by debt to equity ratio across the sample insurance companies under this study and it also indicates those insurance companies are leveraged because they used debt than equity for financing purpose. The trade of theory suggests a positive relationship between profitability and leverage ratio. It says more profitable firms should prefer debt financing to get benefit from tax shield.

Liquidity measures the ability of insurance companies to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses (CR) is measured by dividing current asset to current liability. As clearly shown in the above table CR resulted a maximum of 2.60 and minimum of 0.00. The average value of the liquidity measured by current ratio for insurance companies under the study were 103% that was far below the NBE requirement of 150% which showed the sector was operating at a low current ratio position during the study period. The mean value of the companies CR is 1.03 this implies on average the companies have br. 1.03 current assets to pay every 1 br. Current liability and standard deviation is 0.33. This asset huge gap comes from their operational success and history of their existence.

The premium growth (PG) as proxied by change in gross written premium the average value of premium growth was 0.46%. This implies that on average, the insurance companies' gross premium increased by 0.46 percent over the study period. The maximum values of premium growth were scored by nice insurance company on 2012 was about 48.1% and minimum values of premium growth were scored by Africa insurance company on 2015 was about -21.7% respectively. This high increase and decrease in premium growth for a company in a particular year indicates that unstable premium underwritings.

Concerning the **underwriting risk** variable, which is measured by claim incurred divided by annual premium earned; the mean of incurred claims to annual earned premium ratio was 62%. This implies that on average, most insurance companies from the sample paid 62% loss incurred out of the total premium earned per year which was favorable as compared with acceptable standard of around 70%. The highest ratio of losses incurred to earned premium value was 89.5% incurred by Africa insurance on 2014 which is above the maximum standard of 70%, in additions the minimum value for a company was recorded by Nib insurance company on 2005 was 13% which is far below the maximum standard of 70%. This indicates that there is high variation in underwriting risk in Ethiopia insurance industry during the study period of 2003-2017.

Tangibility of assets (TAN) which is measured by dividing fixed asset by total asset shows the composition of the total asset with regards to current and fixed asset. It shows that, the maximum values of 0.54 which means for every Br. 1 of total asset there is 0.54 cents of fixed asset. The average amount of TAN 0.175 which means 17.5 % of the total asset is composed by fixed asset and. This implies that, insurance companies are highly composed of current assets which may lead them to positive effect on profitability because tangible assets are easily monitored and provide good collateral and thus they tend to mitigate agency conflicts between shareholders and creditors.

Market share (MS) the only industry specific factor in this study has the lowest value of -0.8% recorded by NIB on 2004 due to negative gross premium at that times and with the maximum value of 69% by EIC at 2004(this means that in this period a EIC has generated 69 birr of gross premium from every 100 br. generated by the industry in general. The standard deviation of each insurance company's market share is equal to 0.13 this implies that market share of Ethiopian insurance companies deviate from period to period by the stated amount from both side.

One of the macroeconomic variable employed in this study, **inflation rate** of the country on average over the past fifteen years was 14.1%. The maximum inflation was recorded in the year 2008 which is 36.4% and the minimum was in the year 2009 it was about 2.8%. The rate of inflation was highly dispersed over the periods under study towards its mean with standard deviation of 9.9 %. This implies that inflation rate in Ethiopia during the study period was somehow unstable which may affect the insurance companies profitability.

Finally, regarding to major macroeconomic factor **GDP**, the mean value of real GDP growth rate was 9.7% indicating the average real growth rate of the country's economy over the past 15 years. The maximum growth of the economy was recorded in the year 2005 which is about 12.6% and the minimum was in the year 2003 which is -2.1%. The country has been recording double digit growth rate with little dispersion towards the average over the period under study except the year 2003 and 2008 with the standard deviation of 3.3%. This indicates that economic growth in Ethiopia during the period of 2004 to 2017 remains stable except the year 2003 was recorded negative economic growth.

4.2. CLRM assumptions and Diagnostic tests

The diagnostic tests were undertaken to ensure that the assumptions of classical linear regression model are concerned, the coefficient estimators of both α (constant term) and β (independent variables) that are determined by ordinary least square (OLS) will have a number of desirable properties, and usually known as Best Linear Unbiased Estimators (BLUE). Hence, the following sections discuss results of the diagnostic tests (i.e., the error have zero mean, heteroscedasticity, autocorrelation, multicollinearity and normality) that were conducted to ensure whether the data fits the basic assumptions of classical linear regression model or not. The implication of the test, decision rules therein, test results and their discussion are discussed in the upcoming sub sections.

4.2.1 The Errors have zero mean ($E(u_t) = 0$)

According to Chris B. (2008), if a constant term is included in the regression equation, this assumption will never be violated. Thus, since the regression model used in this study included a constant term, this assumption was not violated.

4.2.2 Heteroscedasticity Test

The homoskedasticity is one of the assumptions of the CLRM which states that the variance of the errors must be constant. If the errors do not have a constant variance, they are said to be heteroskedastic (Chris B., 2008). If heteroscedasticity occur, the estimators of the ordinary least square method are inefficient

and hypothesis testing is no longer reliable or valid as it will under estimate the variances and standard errors.

Table 4.2 Heteroscedasticity for ROA

Heteroskedasticity Test: White

| | | | |
|---------------------|----------|---------------------|--------|
| F-statistic | 0.681468 | Prob. F(9,125) | 0.7245 |
| Obs*R-squared | 6.314069 | Prob. Chi-Square(9) | 0.7081 |
| Scaled explained SS | 11.25268 | Prob. Chi-Square(9) | 0.2588 |

Source: computed via E-views 8, Heteroscedasticity result.

Table 4.3 Heteroscedasticity for ROE

Heteroskedasticity Test: White

| | | | |
|---------------------|----------|---------------------|--------|
| F-statistic | 0.723751 | Prob. F(9,125) | 0.6864 |
| Obs*R-squared | 6.686431 | Prob. Chi-Square(9) | 0.6697 |
| Scaled explained SS | 11.39082 | Prob. Chi-Square(9) | 0.2499 |

Source: computed via E-views 8, Heteroscedasticity result.

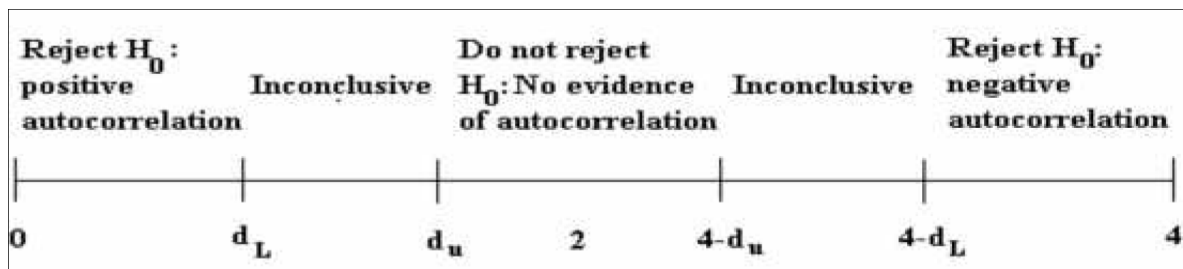
In this study as shown in table 4.2 and 4.3 above both the F-statistic and Chi-Square versions of the test statistic gave the same conclusion that there is no evidence for the presence of heteroscedasticity in both models, since the p-values were in excess of 0.05 or 5%.

4.2.3 Test for Autocorrelation

This is an assumption that the errors are linearly independent of one another (uncorrelated with one another). If the errors are correlated with one another, it is stated that they are auto correlated. Chris B. (2008) noted the well-known test for detecting serial correlation is the Durbin-Watson (DW) test.

The DW test uses two critical values; the upper critical value (dU) and the lower critical value (dL). According to DW test, the null hypothesis of there is no autocorrelation will be rejected if the DW value from the regression is less than DL and greater than 4 -dL. But the null hypothesis is not rejected if the DW value is between dU, and 4-dU. and finally, the test result will be inconclusive if the DW value is

between d_U and d_L , and between $4-d_U$ and $4-d_L$. The rejection /non-rejection rule is given by selecting the appropriate region from the following figure 2:



| Model | 0 | d_L | d_u | 2 | $4-d_u$ | $4-d_L$ | 4 |
|-------|---|-------|-------|--------------|---------|---------|---|
| ROA | 0 | 1.501 | 1.752 | 2.189 | 2.248 | 2.499 | 4 |
| ROE | 0 | 1.501 | 1.752 | 1.852 | 2.248 | 2.499 | 4 |

Source: Own estimation via Eviews 8, durbin watson table, Autocorrelation Test result

The Durbin-Watson test statistic value in the regression result was 2.189 and 1.852 for both model of ROA and ROE respectively. Thus the null hypothesis of no autocorrelation is within the non-rejection region of the number line and thus there is no evidence for the presence of autocorrelation on both model.

4.2.4 Multicollinearity Test

Multicollinearity means the existence of a “perfect” or exact, linear relationship among some or all explanatory variables (Gujarati D, 2004). If multicollinearity is perfect, the regression coefficients of the explanatory variables are indeterminate and their standard errors are infinite. If multicollinearity is less than perfect, the regression coefficients, although determinate, possess large standard errors (in relation to the coefficients themselves), which means the coefficients cannot be estimated with great precision or accuracy. If there is no relationship between the explanatory variables (independent variable), they would be said to be orthogonal to one another. If the explanatory variables were orthogonal to one another, adding or removing a variable from a regression equation would not cause the values of the coefficients on the other variables to change (Chris B, 2008). According to Gujarati, (2004) multicollinearity could only be a problem if the pair-wise correlation coefficient among regressors is

above 0.80. In addition, (Hair JF, 2006) argued that correlation coefficient below 0.9 may not cause serious multicollinearity problem.

Table 4.4 **Multicolliniarity test:** correlation analysis of independent variables

| Correlation | CR | GP | LV | MS | UR | TAN | AGE | INF | GDP |
|-------------|-----------|-----------|----------|-----------|----------|-----------|-----------|----------|----------|
| CR | 1.000000 | | | | | | | | |
| GP | 0.079716 | 1.000000 | | | | | | | |
| LV | -0.233576 | 0.070073 | 1.000000 | | | | | | |
| MS | 0.018879 | -0.005540 | 0.345501 | 1.000000 | | | | | |
| UR | -0.285897 | 0.008126 | 0.272281 | -0.069484 | 1.000000 | | | | |
| TAN | -0.343506 | -0.117859 | 0.064312 | -0.341432 | 0.081332 | 1.000000 | | | |
| AGE | -0.098449 | -0.023557 | 0.400907 | 0.731702 | 0.102989 | -0.126692 | 1.000000 | | |
| INF | -0.058522 | 0.016923 | 0.194367 | -0.000540 | 0.125117 | 0.086649 | -0.066234 | 1.000000 | |
| GDP | -0.109077 | -0.079403 | 0.135465 | -0.006692 | 0.102737 | 0.072022 | 0.095217 | 0.292088 | 1.000000 |

Source: Computed via E-views 8, correlation matrix result

Table 4.4 above showed that there is no strong pair-wise correlation between the explanatory variables (CR, GP, LV, MS, UR, TAN, AGE, INF and GDP). In this study the highest correlation coefficient is 0.731702 between company age and market shares of insurance companies. Thus, it can be concluded using the rule of both Gujarati, (2004) and (Hair JF, 2006) the all variables have low correlation power which is below 0.8 implies no multicollinearity problem in the explanatory variables of this study.

4.2.5 Normality Test

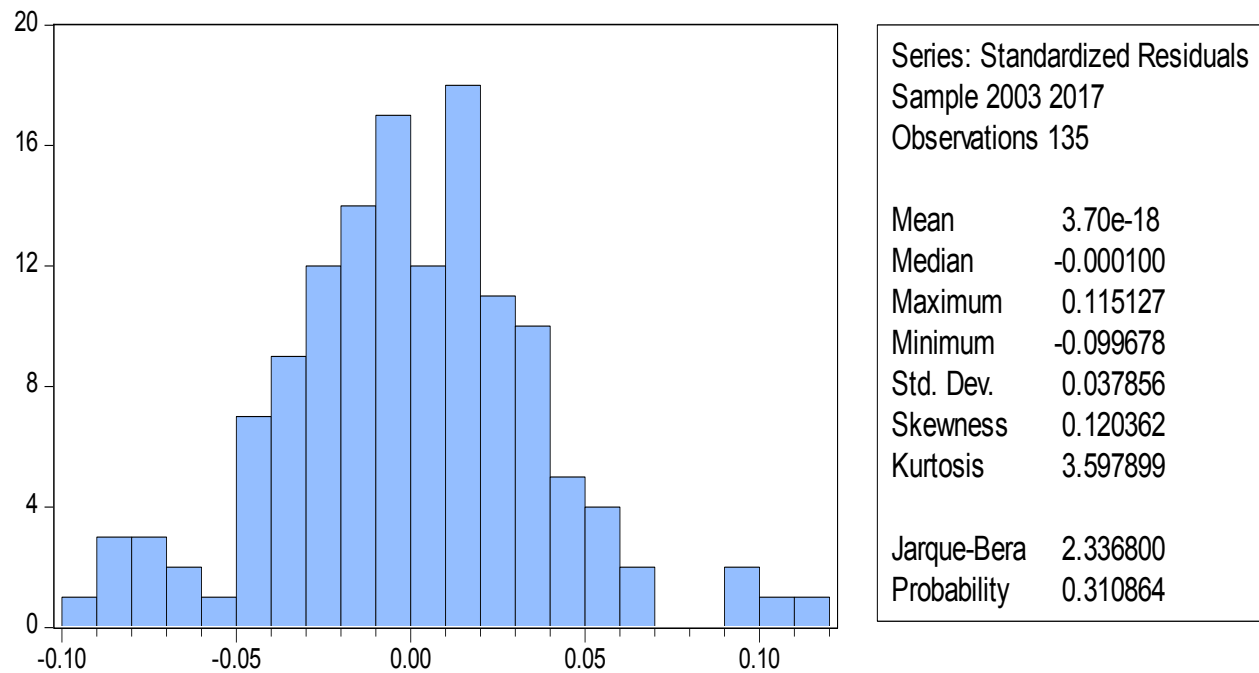
The normality test for this study is shown in figure 4.4 and 4.5 below. If the residuals are normally distributed, the histogram should be bell-shaped and the Bera-Jarque statistic would not be significant meaning disturbance to be normally distributed around the mean. This means that the *p*-value given at the bottom of the normality test screen should be bigger than 0.05 to not reject the null of normality at the 5% level. A normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3 (Chris B., 2008). The hypothesis for the normality test was formulated as follow:

H₀: Error term is normally distributed

H₁: the error term is not normally distributed

Decision Rule: Reject H₀ if P value of JB less than significant level . Otherwise, do not reject H₀.

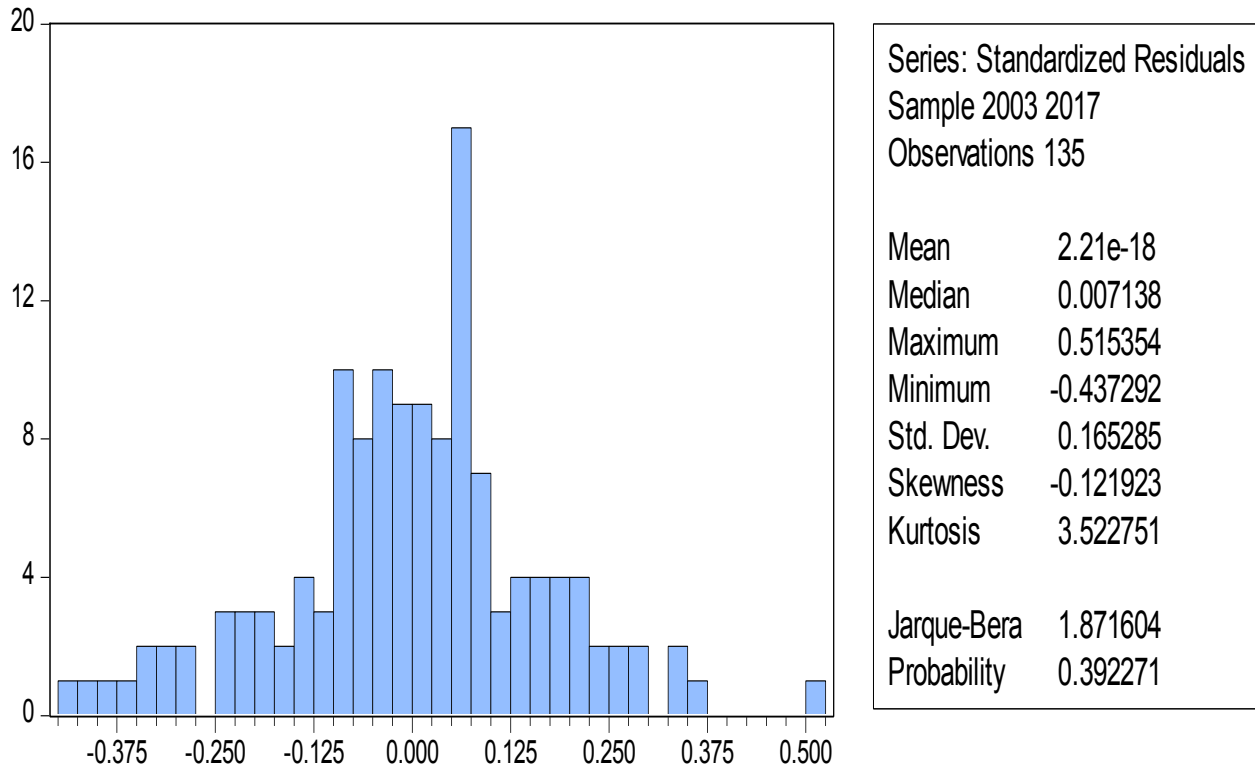
Figure 3. Normality test for ROA model



Source: Own estimation via Eviews-8, Bera-Jarqu normality test

As shown in figure 3 since, the normality tests for this study the coefficient of kurtosis was closer to 3, and the Bera-Jarque statistic has a P-value of 0.31 implies that the p-value for the Jarque-Bera test for models is greater than 0.05 which indicates that the errors are normally distributed. Based on the statistical result, the study failed to reject the null hypothesis of normality at the 5% significance level this implying that the data were normally distributed.

Figure 4. Normality test for ROE model



Source: Own estimation via Eviews-8, Bera-Jarque normality test

As shown in figure 4 since, the normality tests for this study the coefficient of kurtosis was closer to 3, and the Bera-Jarque statistic has a P-value of 0.39 implies that the p-value for the Jarque-Bera test for models is greater than 0.05 which indicates that the errors are normally distributed. Based on the statistical result, the study failed to reject the null hypothesis of normality at the 5% significance level this implying that the data were normally distributed. Therefore, it's concluded that there is no the problem of normality on both models.

4.3 Model Selection

Fixed Effect Versus Random Effect

There are broadly two classes of panel estimator approaches that can be employed in financial research: fixed effects models (FEM) and random effects models (REM). It is also necessary to determine whether the fixed effect or random effect approach is appropriate. A common practice in corporate governance research is to make the choice between both approaches by running a Hausman test (Chris B., 2008). To conduct a Hausman test the number of cross section should be greater than the number of coefficients to be estimated. But, in this study the numbers of coefficients are greater than the number of cross sections so it is not possible to conduct a Hausman test. Therefore, a redundant fixed effects test was conducted to determine whether the fixed effect is appropriate for the models. As a result the cross section fixed is appropriate, so cross section fixed approach was applied. Simple pooled multiple regression techniques also used on which fixed or random effect test is not allowed to test heteroscedasticity.

4.4. Regression Analysis

This section presents the overall results of the regression analysis on the determinants of Ethiopian insurance companies' profitability. In this study ROA and ROE were used as proxy for profitability measure. The regression analysis result is presented by using separate table for each model.

4.4.1. Regression result of model I ROA

Table 4.5 below shows the regression analysis for ROA. In this regression analysis the dependent variable is ROA while the independent variables are company age, leverage, liquidity, premium growth, underwriting risk, tangibility of asset, market share, growth rate of GDP and inflation. The following regression equation estimated as follow.

$$ROA_{i,t} = \alpha + \beta_1 AGE_{i,t} + \beta_2 LV_{i,t} + \beta_3 LQ_{i,t} + \beta_4 GPI_{i,t} + \beta_5 URI_{i,t} + \beta_6 TANI_{i,t} + \beta_7 MSI_{i,t} + \beta_8 INF + \beta_9 GDP + \epsilon_{i,t}$$

Dependent Variable: ROA
Method: Panel Least Squares
Date: 12/10/18 Time: 20:15
Sample: 2003 2017
Periods included: 15
Cross-sections included: 9
Total panel (balanced) observations: 135

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|-----------|
| C | -0.073458 | 0.042562 | -1.725877 | 0.0870 |
| AGE | 0.010490 | 0.000917 | 11.43680 | 0.0000* |
| LV | -0.036837 | 0.046956 | -0.784490 | 0.4343 |
| CR | 0.032885 | 0.017639 | 1.864348 | 0.0648*** |
| GP | 0.001530 | 0.000766 | 1.997501 | 0.0481** |
| UR | -0.060858 | 0.033764 | -1.802462 | 0.0740*** |
| TAN | 0.019162 | 0.048661 | 0.393783 | 0.6945 |
| MS | 0.415356 | 0.104629 | 3.969794 | 0.0001* |
| INF | 0.032968 | 0.039101 | 0.843160 | 0.4009 |
| GDP | -0.255845 | 0.112417 | -2.275863 | 0.0247** |

Effects Specification

Cross-section fixed (dummy variables)

| | | | |
|--------------------|----------|-----------------------|-----------|
| R-squared | 0.653384 | Mean dependent var | 0.092184 |
| Adjusted R-squared | 0.603021 | S.D. dependent var | 0.064299 |
| S.E. of regression | 0.040513 | Akaike info criterion | -3.450844 |
| Sum squared resid | 0.192028 | Schwarz criterion | -3.063474 |
| Log likelihood | 250.9320 | Hannan-Quinn criter. | -3.293427 |
| F-statistic | 12.97347 | Durbin-Watson stat | 2.189352 |
| Prob(F-statistic) | 0.000000 | | |

*, ** & *** indicates significant at 1%, 5% & 10% significance level respectively.

Source: Each insurance companies annual report, NBE and own computation via E-views 8

The regression results reported in the above Table depicted that, The R-squared and Adjusted R² values of 0.653 and 0.603 respectively is an indication that the model is a good fit. The R² value is 0.653 (65.3 %) which implies that 65.3% of fitness can be observed in the sample regression line. This can be further explained as, 65.3% of the total variation in profitability is explained by the independent variables (company age, leverage, liquidity, premium growth, underwriting risk, tangibility of asset, market share, growth rate of GDP and inflation) jointly. The remaining 34.7% of change is explained by other factors which are not included in the model. Furthermore, the F-statistic was 12.97 and the probability of rejecting the null hypothesis that there is no statistically significant relationship existing between the dependent variable (ROA) and the independent variables, is 0.000000 indicates that the overall model is

highly significant and that all the independent variables are jointly significant in causing variation in return on asset at 1% significance level.

The fixed effect estimation regression result in the above table shows that, coefficient intercept (α) is -0.073458. This means, when all explanatory variables took a value of zero, the average value ROA would take -0.073458 unit and statistically significant at 10% level of significance.

Company Age

Another factor is the company age which is measured by number of years since the company starts operation. The coefficient of company age (AGE) is positive (0.010490) and statistically significant with p-value of 0.0000 which is below 0.05. This means when company age increased by one year, return on asset (ROA) of sampled Ethiopian insurance companies would increase by 1.04%, the relationship is statistically significant at 1% of significance level. The positive relationship between company age and profitability are a results of older firms are more experienced, they have enjoyed the benefits of learning, they are not prone to the liabilities of newness, and they can therefore enjoy superior performance. Older firms may also benefit from reputation effects, which allows them to earn a higher margin on profit. This study finding is consistent with previous studies by Hifza M. (2011) Derbali (2014), found a positive and significant relationship between company age and profitability.

Leverage

Leverage is measured by debt ratio (LV). The coefficient of leverage ratio is negative (-0.036837) and statistically insignificant with p-value of 0.4343 which is higher than 0.05. The negative result shows that there is inverse relationship between leverage and ROA. To support this the theories of capital structure tells us that the insurance companies with lower leverage will generally report higher ROA. Therefore, this negative relationship is expected and the result is consistence with previous studies which found a negative relationship between leverage and ROA, for instance Abate (2012), Hifza.M (2011) Teklit & Jasmindeep (2012), Nikhel B. et al. (2015), Andres & Stephen (2013) and several others. This shows higher the insurance companies assets financed through debt the lower will be its return on asset.

Liquidity

Liquidity is measured by Current Ratio (CR). The above table depicted that, the coefficient of liquidity measured by current assets to current liability is 0.032885 and its P-value is 0.0648. Holding other independent variables constant at their average value, when liquidity increased by 1%, return on asset (ROA) of sampled Ethiopian insurance companies would increase by 3.2%, but the relationship is statistically insignificant at 5% of significance level. In other words, there is insignificant positive relationship between liquidity and return on asset (ROA) of sampled Ethiopian insurance companies. Therefore, the researcher rejects the null hypothesis that there is negative relationship between liquidity and ROA. This means, there is no sufficient evidence to support the negative relationship between liquidity and ROA. This positive relationship is not expected but the result is consistence with previous studies which found a positive relationship between liquidity and ROA, for instance, Suheyli (2015), Nikhel et al. (2015), Charumathi B. (2012) and Edlira.L (2016). The higher the insurance companies liquidity the higher will be its return on asset as well.

Premium growth

Concerning the premium growth, the regression results in this research shows the coefficient of growth premium (GP) is positive with (0.001530) and it is statistically significant determinants of profitability for insurance companies in Ethiopia with the probability of (0.0481). The positive coefficient of growth premium indicates a direct relationship between growth premium and ROA. It implies that Insurance companies underwrite more premium over the years have better chance of being profitable for the reason that they gain return from premium collected when the excessive attention on marketing to grow premiums with a proportionate allocation of resources towards the management of their investment portfolios is given. The result of the study supports the findings Qamar.M.et al of (2016), Suhali.R (2015) and Asrat & Tegegn (2016).

Underwriting risk

The underwriting risk emphasizes the efficiency of the insurer's underwriting activity and the exposure to financial loss resulting from the selection and approval of risks to be insured. The coefficient of

underwriting risk is negative (-0.060858) and statistically significant at 10% significance level with p-value of 0.0740. The negative result shows that there is inverse relationship between underwriting risk and profitability. It implies that higher underwriting risk increases the operating ratio, indicating adverse effect on the firm's return on asset. This finding is consistent with previous studies Ying Lee (2014), Burca and Batrinca (2014), Mistre S (2015) and Suhali.R (2015), they concluded that underwriting risk has a negative influence on the insurer's profitability, since taking an excessive underwriting risk can affect the company's stability through higher expenses.

Tangibility of assets

Tangibility of asset is measured by dividing fixed asset by the total asset (TAN). The coefficient of TAN is positive 0.019162 and statistically insignificant with p-value of 0.6945 which is above 0.05. The positive result shows that there is direct relationship between tangibility of asset and ROA. The regression result is in consistent with the hypothesis of the study. The regression result of this study regarding the effect of tangibility of assets of insurance companies on their profitability is similar with empirical evidences by Meaza M. (2014), Kalkidan (2016) and Malik (2011). It revealed that there exists a positive relationship between tangibility of assets and profitability of insurance companies in Ethiopia due to the fact that higher the firm's total assets are composed of fixed asset the higher will be its ROA because tangible assets provide good collateral for the insurers.

Market Share

Market share is industry specific variable measured by the growth in gross premium written by the insurance companies (MS). The coefficient of MS is positive (0.415356) and statistically significant with p-value of 0.0001 which is below 0.05. The positive relationship between MS and ROA shows that there is a direct relationship between market share and profitability of Ethiopian insurance companies. The positive relationships are created due to the fact that the higher market share gives the insurance companies the chance to utilize economies of scale to reduce costs and give insurance companies more power to set price. This positive relationship is expected and the result is consistence with previous studies which found a positive relationship between the market share and ROA, for instance Edlira Luçi et al, (2016), Lyndon M. et al (2016).Choi and Weiss (2005) by analyze the relationship between market

share and performance of US property liability insurance industry from 1992-1998 find out positive result. The higher the firm market share the higher will be its return on asset.

Inflation

Inflation (INF) is measured by the growth in selling price of products in the country. The regression result shows that inflation has a positive and insignificant impact on profitability of Ethiopia insurance companies, since the beta coefficient and probability of INF are 3.29% and 0.4009 respectively. This means when inflation increased by 1%, return on asset (ROA) of sampled Ethiopian insurance companies would increase by 3.3%, but the relationship is statistically insignificant at 5% of significance level. So, the researcher rejects the null hypothesis that there is negative and significant relationship between inflation and ROA, since it is inconsistent with the regression result of the study. From the actual result one can conclude that inflation do not have influence on Ethiopian insurance companies' profitability since the study could not get enough statistical result that support negative and significant relationship between inflation and ROA. This result is also consistent with findings by Andres C. (2017), Godfrey (2012), and Hadush G. (2015) who found insignificant positive relationship between inflation and ROA.

Gross Domestic Product

GDP is the most important single macroeconomic indicator of progress in economic development. GDP is measured by the growth in gross domestic products of the country. The coefficient of GDP is negative (-0.255) and statistically significant at 5% significance level with p-value of 0.0247 which is lower than 0.05. The major reason behind negative relationships between economic growth and profitability is while the country economy grows; the demand for insurance coverage like automobile insurance, home owner insurance, worker compensations insurance are relatively increase and the degree of people involvement in risky investments also increases this and other factors not included in this study may affect insurance company profitability negatively, The research finding is consistence with previous studies which found a negative relationship between economic growth and ROA, for instance Suhali. R (2015), Qamar M. et al. (2016), Kalkidan (2016), Behailu (2017) and Andres & Stephen (2013). The higher the growth rate of the country the lower will be the insurance industries profitability.

4.4.2. Regression result of model II ROE

Table 4.6 below shows the regression analysis for ROE. In this regression analysis the dependent variable is ROE while the independent variables are company age, leverage, liquidity, premium growth, underwriting risk, tangibility of asset, market share, growth rate of GDP and inflation. Thus, the model used to examine the determinants of profitability in Ethiopian Insurance Companies was.

$$ROE_{i,t} = \alpha + \beta_1 AGE_{i,t} + \beta_2 LV_{i,t} + \beta_3 LQ_{i,t} + \beta_4 GP_{i,t} + \beta_5 UR_{i,t} + \beta_6 TAN_{i,t} + \beta_7 MS_{i,t} + \beta_8 INF_{i,t} + \beta_9 GDP_{i,t} + \epsilon_{i,t}$$

Dependent Variable: ROE
 Method: Panel Least Squares
 Date: 12/16/18 Time: 14:33
 Sample: 2003 2017
 Periods included: 15
 Cross-sections included: 9
 Total panel (balanced) observations: 135

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|-----------|
| C | -0.699857 | 0.185836 | -3.765997 | 0.0003 |
| AGE | 0.052498 | 0.004005 | 13.10873 | 0.0000* |
| LV | 0.141122 | 0.205021 | 0.688329 | 0.4926 |
| CR | 0.144207 | 0.077015 | 1.872465 | 0.0636*** |
| GP | 0.005461 | 0.003344 | 1.632967 | 0.1052 |
| UR | -0.092695 | 0.147419 | -0.628787 | 0.5307 |
| TAN | 0.009435 | 0.212461 | 0.044408 | 0.9647 |
| MS | 1.535074 | 0.456830 | 3.360273 | 0.0011* |
| INF | 0.019654 | 0.170721 | 0.115122 | 0.9085 |
| GDP | -1.626053 | 0.490833 | -3.312841 | 0.0012* |

Effects Specification

Cross-section fixed (dummy variables)

| | | | |
|--------------------|----------|-----------------------|-----------|
| R-squared | 0.718612 | Mean dependent var | 0.329605 |
| Adjusted R-squared | 0.677726 | S.D. dependent var | 0.311587 |
| S.E. of regression | 0.176886 | Akaike info criterion | -0.503062 |
| Sum squared resid | 3.660753 | Schwarz criterion | -0.115692 |
| Log likelihood | 51.95671 | Hannan-Quinn criter. | -0.345646 |
| F-statistic | 17.57619 | Durbin-Watson stat | 1.852422 |
| Prob(F-statistic) | 0.000000 | | |

*, ** & *** indicates significant at 1%, 5% & 10% significance level respectively.

Source: Each insurance companies annual report, NBE and own computation via E-views 8

The regression results reported in the above Table shows that, The R-squared and Adjusted R² values of 0.718 and 0.677 respectively is an indication that the model is a good fit. The R² value is 0.718 (71.8 %) which implies that 71.8% of fitness can be observed in the sample regression line. This can be further explained as, 71.8% of the total variation in profitability(ROE) is explained by the independent variables (company age, leverage, liquidity, premium growth, underwriting risk, tangibility of asset, market share, growth rate of GDP and inflation) jointly. The remaining 28.2% of change is explained by other factors which are not included in the model. Furthermore, the F-statistic was 17.57 and the probability of rejecting the null hypothesis that there is no statistically significant relationship existing between the dependent variable (ROE) and the independent variables, is 0.000000 indicates that the overall model is highly significant and that all the independent variables are jointly significant in causing variation in return on equity at 1% significance level.

The fixed effect estimation regression result in the above table shows that, coefficient intercept (α) is -0.699857. This means, when all explanatory variables took a value of zero, the average value ROE would take -0.699857 unit and statistically significant at 1% level of significance.

Company Age

Company age which is measured by number of years since the company starts operation. The coefficient of company age (AGE) is positive (0.052498) and statistically significant with p-value of 0.0000 which is below 0.05. This means when company age increased by one year, return on equity (ROE) of sampled Ethiopian insurance companies would increase by 5.24%, the relationship is statistically significant at 1% of significance level. The positive relationship between company age and ROE are a results of older firms are more experienced, they have enjoyed the benefits of learning, they are not prone to the liabilities of newness, and Older firms may also benefit from reputation effects, which allows them to earn a higher margin on profit. This study finding is consistent with previous study by Derbali (2014), found a positive and significant relationship between company age and ROE.

Leverage

Leverage is measured by debt ratio (LV). The coefficient of leverage ratio is positive (0.141122) and statistically insignificant with p-value of 0.4926 which is higher than 0.05. The positive result tells us that all other variables remain constant when leverage increase by 1% ROE will increase by 14.1% and the relationship is insignificant at 5% significance level. This positive relationship is not expected but the result is consistence with previous study which found a positive relationship between leverage and ROE, for instance Adames & Buckle (2000) find positive relationship between leverage and ROE. This shows higher the insurance companies assets financed through debt the higher will be its equity.

Liquidity

Liquidity is measured by Current Ratio (CR). The above table depicted that, the coefficient of liquidity measured by current assets to current liability is 0.144207 and its P-value is 0.0636. Holding other independent variables constant at their average value, when liquidity increased by one percent, return on equity (ROE) of sampled Ethiopian insurance companies would increase by 14.4%, but the relationship is statistically insignificant at 5% of significance level. In other words, there is insignificant positive relationship between liquidity and return on equity (ROE) of sampled Ethiopian insurance companies. Therefore, the researcher rejects the null hypothesis that there is negative relationship between liquidity and ROE.

This positive relationship is not expected but the result is consistence with previous studies which found a positive and insignificant relationship between liquidity and ROE, for instance, Charumathi B. (2012), Nikhil B. (2015) and Qamar. M et al. (2016). The higher the insurance companies liquidity the higher will be its ROE as well.

Premium growth

Concerning the premium growth, the regression results in the above table shows the coefficient of growth premium (GP) is positive with (0.005461) and it is statistically insignificant determinants of profitability for insurance companies in Ethiopia with the probability of (0.1052). The positive coefficient of growth

premium indicates a direct relationship between growth premium and ROE. It implies that Insurance companies underwrite more premium over the years have better chance of being profitable for the reason that they gain return from premium collected when the excessive attention on marketing to grow premiums with a proportionate allocation of resources towards the management of their investment portfolios is given. The result of this study supported by the finding of Qamar.M.et al (2016).

Underwriting risk

The underwriting risk emphasizes the efficiency of the insurer's underwriting activity and the exposure to financial loss resulting from the selection and approval of risks to be insured. The coefficient of underwriting risk is negative (-0.092695) and statistically insignificant at 5% significance level with p-value of 0.5307. The negative result shows that there is inverse relationship between underwriting risk and ROE of Ethiopian insurance companies. It implies that higher underwriting risk increases the operating ratio, indicating adverse effect on the firm's return on equity. This finding is consistent with previous study by Adames & Buckle (2000), they concluded that underwriting risk has a negative influence on the insurer's profitability, since taking an excessive underwriting risk can affect the company's stability through higher expenses.

Tangibility of assets

Tangibility of asset is measured by dividing fixed asset by the total asset (TAN). The coefficient of TAN is positive 0.009435 and statistically insignificant with p-value of 0.9647 which is above 0.05. The positive result shows that there is direct relationship between tangibility of asset and ROE. The regression result is consistent with the hypothesis of the study. The regression result of this study regarding the effect of tangibility of assets of insurance companies ROE is similar with empirical evidences by Ayle (2000) and Nikhil B. (2015). It revealed a positive relationship between tangibility of assets and ROE due to the fact that higher the firm's total assets are composed of fixed asset the higher will be its ROE because tangible assets provide good collateral for the insurers.

Market Share

Market share is industry specific variable measured by the growth in gross premium written by the insurance companies (MS). The coefficient of MS is positive (1.535074) and statistically significant with p-value of 0.0011 which is below 0.05. The positive relationship between MS and ROE shows that there is a direct relationship between market share and profitability of Ethiopian insurance companies proxied by ROE. The positive relationships are created due to the fact that the higher market share gives the insurance companies the chance to utilize economies of scale to reduce costs and give insurance companies more power to set price. This positive relationship is expected and the result is consistency with previous studies which found a positive relationship between the market share and ROE, for instance Lyndon M. et al (2016). The higher the firm market share the higher will be its return on equity.

Inflation

Inflation (INF) is measured by the growth in selling price of products in the country. The regression result shows that inflation has a positive and insignificant impact on profitability of Ethiopia insurance companies, since the beta coefficient and probability of INF was 0.019654 and 0.9085 respectively. This means when inflation increased by 1%, return on equity (ROE) of sampled Ethiopian insurance companies would increase by 1.97%, but the relationship is statistically insignificant at 5% of significance level. So, the researcher rejects the null hypothesis that there is negative and significant relationship between inflation and ROE, since it is inconsistent with the regression result of the study. From the actual result one can conclude that inflation do not have influence on Ethiopian insurance companies' profitability since the study could not get enough statistical result that support negative and significant relationship between inflation and ROE.

Gross Domestic Product

GDP is the most important single macroeconomic indicator of progress in economic development. The coefficient of GDP is negative (-1.626053) and statistically significant at 5% significance level with p-value of 0.0012 which is lower than 0.05. This means when GDP increased by 1%, return on equity (ROE) of sampled Ethiopian insurance companies would decrease by 162%, and the relationship is

statistically significant at 5% of significance level. The research finding is consistency with previous study which found a negative relationship between economic growth and ROE, for instance Qamar M. et al. (2016). The higher the growth rate of the country the lower will be the insurance companies ROE.

4.5 Summary of Analysis

Table 4.7: Summary and Comparison of test result with expectation for ROA model

| Dependent variable | | ROA | | |
|-----------------------|-----------------------|---------------------|-------------------------------|-------------------|
| Explanatory variables | Expected relationship | Actual relationship | Statistical significance Test | Hypothesis status |
| CR | Negative | Positive | Insignificant | Rejected |
| GP | Positive | Positive | Significant at 5% | Failed to reject |
| LV | Negative | Negative | Insignificant | Rejected |
| MS | Positive | Positive | Significant at 1% | Failed to reject |
| UR | Negative | Negative | Insignificant | Rejected |
| TAN | Positive | Positive | Insignificant | Rejected |
| AGE | Positive | Positive | Significant at 1% | Failed to reject |
| INF | Negative | Positive | Insignificant | Rejected |
| GDP | Positive | Negative | Significant at 5% | Failed to reject |

Source: - Developed by the researcher.

As shown from the above summary table 4.7 the independent variables: liquidity, inflation and GDP were deviated from the expected results it implies the researcher hypothesized negative relationship

between liquidity and ROA but the finding result is positive. So, the possible reason for the positive association between liquidity and ROA could be attributed to the fact that, Ethiopian insurance companies are more liquid. Companies with a more level of liquidity will have more cash and will have less difficulties in repaying to policyholders when loss occurred. In additions the insignificant positive relationship between inflation and ROA while the researcher expected negative relationship is due to the reason of transferring effect which implies as inflation increases insurance companies forced to raise their premium in order to maintain their profit margin. Therefore, the researcher rejected the null hypothesis of both liquidity and inflation. GDP is also other variable which is inconsistency with the researcher hypothesis of positive significant relationship with ROA while the regression result was negative and statistically significant relationship due to the fact that when the economy grows people demand for insurance and the degree of involvement in risky investments is higher and this will in turn affect Ethiopian insurance companies profitability negatively.

As shown from the summary table 4.8 below the independent variables: liquidity, leverage, inflation and GDP were deviated from the expected results it implies the researcher hypothesized negative relationship between liquidity and ROE but the finding result is positive. So, the possible reason for the positive association between liquidity and ROE could be attributed to the fact that, Ethiopian insurance companies are more liquid. Leverage is other variable which actual result positive relationship with ROE, as the trade of theory says more profitable firms should prefer debt financing to get benefit from tax shield. In additions the insignificant positive relationship between inflation and ROE while the researcher expected negative relationship is due to the reason of transferring effect which implies as inflation increases insurance companies forced to raise their premium in order to maintain their profit margin .Therefore, the researcher rejected the null hypothesis of liquidity, leverage and inflation.

Table 4.8: Summary and Comparison of test result with expectation for ROE model

| Dependent variable | | ROE | | |
|------------------------------|------------------------------|----------------------------|--------------------------------------|--------------------------|
| Explanatory variables | Expected relationship | Actual relationship | Statistical significance Test | Hypothesis status |
| CR | Negative | Positive | Insignificant | Rejected |
| GP | Positive | Positive | Insignificant | Rejected |
| LV | Negative | Positive | Insignificant | Rejected |
| MS | Positive | Positive | Significant at 1% | Failed to reject |
| UR | Negative | Negative | Insignificant | Rejected |
| TAN | Positive | Positive | Insignificant | Rejected |
| AGE | Positive | Positive | Significant at 1% | Failed to reject |
| INF | Negative | Positive | Insignificant | Rejected |
| GDP | Positive | Negative | Significant at 1% | Failed to reject |

Source: Developed by the researcher.

GDP is the other variable which has inverse relationship with ROE and the researcher fails to reject the null hypothesis due to the fact that GDP has statistically significant relationship with Ethiopian insurance companies' profitability.

Chapter Five

Summary, Conclusions and Recommendations

Based on the finding of the study summary and conclusions are drawn and possible recommendations are forwarded. Accordingly, the first section presents the summary and conclusion part and the second section present the possible recommendation.

5.1. Summary

The main objective of this study was to investigate most important determinants of insurance companies' profitability in Ethiopia. According to previous studies made on the determinants of insurance companies' profitability, profitability is affected by both internal and external factors. Internal factors are factors that are under the control of insurance companies' management and also called company specific factors. Those factors include company age, leverage, liquidity, premium growth, underwriting risk and tangibility of asset. Furthermore, external factors represent events outside the control of insurance companies which is composed of industry specific and macroeconomic factor like market share, growth rate of GDP and inflation. In this study two measures of profitability were used: this were ROA and ROE.

The empirical analysis of investigating the determinants of the profitability of Ethiopian insurance companies was conducted using a panel data set consisting of financial data of nine insurers over the period of 2003 to 2017. , which were analyzed using descriptive statistics, and multiple linear regression analysis. The analyses were made in line with the specific research objectives and stated hypotheses formulated in the study. Thus, panel data of nine insurance companies for fifteen years was used for the analysis purpose. Data used for the insurance specific factors were obtained from each companies audited financial reports from NBE, whereas data of external factors were obtained from NBE and MoFEC. Before making regression analysis, the study goes through all diagnostic tests, including the errors have zero mean, multicollinearity, heteroscedasticity; normality and autocorrelation were made for the classical linear regression model by using E-views 8 software. Regression Analysis was identified as the most appropriate tool for econometric analysis of the data. The assumptions needed to be fulfilled for OLS were tested; the data was found to be homoskedastic, free of autocorrelation, free of Multi-collinearity and normally distributed.

In relation to the regression result measured by ROA; company age, market share and premium growth have positive significant impact on the profitability of Ethiopian insurance companies, on the other hand GDP and underwriting risk have negative significant impact at 5% and 10% significance level respectively. When comes to Liquidity, tangibility of asset and inflation have positive and insignificant impact on ROA, while leverage has negative and insignificant impact on profitability. To sum up except liquidity, inflation and GDP all independent variables were in agreement with the research hypothesis. The explanatory variables included in this study jointly explain about 65.3% of the variation in return on asset.

With regard to the second regression result measured by ROE; company age and market share have positive significant impact on the profitability of Ethiopian insurance companies, on the other hand GDP has negative significant impact. All other variables except underwriting risk have positive and insignificant impact on profitability of insurance companies' which is proxied by ROE. To sum up except liquidity, leverage, inflation and GDP all independent variables were in agreement with the research hypothesis. The explanatory variables included in this study jointly explain about 71.8% of the variation in return on equity.

5.2 Conclusions

Based on the findings, it can be concluded that company age, premium growth and market share, have significant positive impact on ROA; which means any increase/decrease on the value of these variables leads to an increase/decrease on the profitability of Ethiopian insurance companies proxied by (ROA). And also GDP has significant impact on ROA with a negative relationship; which means any increase/decrease on the value of this variables leads to a decrease/increase on profitability of Ethiopian insurance companies. In contrast, leverage, liquidity, underwriting risk, tangibility of asset and inflation have insignificant relationship with ROA.

Concerning on return on equity, it can be concluded that company age and market share, have significant positive impact on ROE; which means any increase/decrease on the value of these variables leads to an increase/decrease on the profitability of Ethiopian insurance companies proxied by (ROE). And also GDP has significant negative impact on ROE; which means any increase/decrease on the value of this variables leads to a decrease/increase on profitability of

Ethiopian insurance companies. In contrast, leverage, liquidity, premium growth, underwriting risk, tangibility of asset and inflation have insignificant relationship with ROE.

5.3 Recommendations

Based on the study finding, the profitability of Ethiopian insurance companies measured by ROA and ROE were affected by both the internal and external factors; i.e. company age, market share and economic growth of GDP. Since the management of the insurance companies has control over the company specific (internal) factors, it is possible to improve the performance of the insurers by giving more attention on the identified insurance specific factors such as, company age, liquidity and market share. Therefore, On the basis of the findings of this study, the researcher has drawn the following recommendations.

- ❖ The sector was operating at low liquidity position; therefore the insurers' should closely review liquidity risk and device the strategy like liquidity management program and cash flow forecast to reduce the high liquidity risk.
- ❖ Since, there is strong positive significant relationship between market share and profitability .Insurance companies need to take actions in order to increase their market share by opening branches in rural and urban locations, by providing new product lines and by making extensive advertisement they can maximize their profitability.
- ❖ Even though, macroeconomic factors are not controlled by the management, companies should prepare themselves for the change in economic growth of GDP by preparing financial plans like cash budget, and pro-forma balance sheet and income statement this will help Insurance companies to easily adopt the economic changes of the country.
- ❖ The researcher also recommend investors to invest on older insurance companies than youngers since, on both models company age has positive and significant effect on Ethiopian insurance companies profitability.

Finally, this study investigates the determinants of insurance companies' profitability in Ethiopian by examining only limited variables by using 15 years' data .However, the variables used in this study did not include all factors that can affect Ethiopian insurers' profitability. Thus, future research shall conduct on the profitability of Ethiopian insurance companies by increasing the number of observations through the use of large sample size and longer years of data and include the rest unseen insurance specific and macroeconomic variables.

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APPENDICES

Appendix A. lists of insurance companies operating in Ethiopia

| No. | Insurance co. | Establishment year |
|-----|---|--------------------|
| 1 | Ethiopian Insurance Corporation | 1976 |
| 2 | Africa Insurance Company S.C | 1994 |
| 3 | Awash Insurance Company S.C | 1994 |
| 4 | National Insurance Company of Ethiopia S.C. | 1994 |
| 5 | Nile Insurance Company S.C | 1995 |
| 6 | Nyala Insurance Company S.C | 1995 |
| 7 | Global Insurance Company S.C. | 1997 |
| 8 | The United Insurance S.C | 1997 |
| 9 | NIB Insurance Company | 2002 |
| 10 | Lion Insurance Company S.C | 2007 |
| 11 | Ethio-Life and General Insurance S.C. | 2008 |
| 12 | Oromia Insurance Company S.C. | 2009 |
| 13 | Abay Insurance Company | 2010 |
| 14 | Berhan Insurance S.C. | 2011 |
| 15 | Lucy Insurance S.C. | 2012 |
| 16 | Tsehay Insurance S.C. | 2012 |
| 17 | Bunna Insurance S.C. | 2013 |

List of sample insurance company used for this study.

Appendix B. Operationalizing of the Study Variables

| Variables | | Measurement | Expected Sign |
|--------------------|----------------------|---|---------------|
| Dependent | ROA | Net Profit before tax/ Total assets | NA |
| | ROE | Net Profit before tax/ Total Share holders' equity | NA |
| Independent | Company Age | Number of Years since the company start operation | + |
| | Leverage | Total Debt /Total Share holders' Equity | - |
| | Liquidity | Current Assets / Current Liabilities | - |
| | Premium Growth | $(GWP(t)-GWP(t-1)) / GWP (t-1)$ | + |
| | Underwriting Risk | Claim incurred / Annual premium earned | - |
| | Tangibility of Asset | Fixed asset/ Total asset | + |
| | Market Share | $\frac{\text{Gross premium of each firm}}{\text{Gross premium industry}}$ | + |
| | Inflation | $(I(t) - I(t-1)) / I(t-1)$ | - |
| | Economic growth(GDP) | $(GDP(t) - GDP(t-1)) / GDP(t-1)$ | + |

Appendix C. Data used for analysis

| Insurance | Year | CR | GP | MS | LV | GDP | INF | TAN | UR | AGE | ROA | ROE |
|-----------|------|------|-------|------|------|--------|-------|------|------|-----|--------|--------|
| EIC | 2003 | 0.99 | 0.01 | 0.43 | 0.84 | -0.021 | 0.073 | 0.12 | 0.54 | 27 | 0.08 | 0.47 |
| EIC | 2004 | 1.02 | 0.39 | 0.69 | 0.83 | 0.117 | 0.061 | 0.11 | 0.48 | 28 | 0.09 | 0.57 |
| EIC | 2005 | 1.15 | -0.04 | 0.53 | 0.84 | 0.126 | 0.105 | 0.10 | 0.54 | 29 | 0.10 | 0.60 |
| EIC | 2006 | 1.23 | -0.03 | 0.53 | 0.66 | 0.115 | 0.158 | 0.08 | 0.67 | 30 | 0.07 | 0.21 |
| EIC | 2007 | 1.21 | 0.03 | 0.50 | 0.68 | 0.118 | 0.253 | 0.08 | 0.69 | 31 | 0.09 | 0.28 |
| EIC | 2008 | 0.99 | 0.18 | 0.49 | 0.74 | 0.112 | 0.364 | 0.07 | 0.72 | 32 | 0.09 | 0.35 |
| EIC | 2009 | 1.11 | 0.04 | 0.44 | 0.74 | 0.1 | 0.028 | 0.07 | 0.73 | 33 | 0.09 | 0.34 |
| EIC | 2010 | 1.09 | 0.66 | 0.44 | 0.76 | 0.106 | 0.181 | 0.07 | 0.62 | 34 | 0.13 | 0.55 |
| EIC | 2011 | 0.99 | 0.04 | 0.42 | 0.80 | 0.114 | 0.341 | 0.08 | 0.74 | 35 | 0.11 | 0.55 |
| EIC | 2012 | 0.94 | 1.12 | 0.49 | 0.82 | 0.087 | 0.135 | 0.06 | 0.56 | 36 | 0.14 | 0.78 |
| EIC | 2013 | 0.97 | 0.18 | 0.40 | 0.83 | 0.099 | 0.081 | 0.07 | 0.67 | 37 | 0.17 | 0.95 |
| EIC | 2014 | 0.98 | 0.2 | 0.45 | 0.81 | 0.103 | 0.077 | 0.08 | 0.60 | 38 | 0.19 | 1.04 |
| EIC | 2015 | 0.95 | 0.01 | 0.40 | 0.83 | 0.104 | 0.074 | 0.07 | 0.62 | 39 | 0.19 | 1.00 |
| EIC | 2016 | 1.06 | 0.11 | 0.49 | 0.75 | 0.08 | 0.089 | 0.07 | 0.61 | 40 | 0.18 | 1.04 |
| EIC | 2017 | 1.11 | 0.37 | 0.41 | 0.73 | 0.102 | 0.099 | 0.06 | 0.62 | 41 | 0.21 | 1.11 |
| Awash | 2003 | 1.23 | 0.1 | 0.07 | 0.60 | -0.021 | 0.073 | 0.09 | 0.56 | 8 | 0.08 | 0.19 |
| Awash | 2004 | 0 | -0.82 | 0.02 | 0 | 0.117 | 0.061 | 0 | 0.49 | 9 | (0.03) | (0.60) |
| Awash | 2005 | 1.16 | 6.23 | 0.09 | 0.61 | 0.126 | 0.105 | 0.12 | 0.55 | 10 | 0.08 | 0.21 |
| Awash | 2006 | 1.11 | -0.51 | 0.04 | 0.66 | 0.115 | 0.158 | 0.11 | 0.66 | 11 | 0.06 | 0.18 |
| Awash | 2007 | 0.99 | 0.34 | 0.05 | 0.69 | 0.118 | 0.253 | 0.15 | 0.78 | 12 | 0.07 | 0.21 |
| Awash | 2008 | 0.82 | 0.77 | 0.08 | 0.70 | 0.112 | 0.364 | 0.21 | 0.70 | 13 | 0.07 | 0.23 |
| Awash | 2009 | 0.79 | 0.08 | 0.07 | 0.73 | 0.1 | 0.028 | 0.24 | 0.81 | 14 | 0.05 | 0.19 |
| Awash | 2010 | 0.83 | 0.64 | 0.08 | 0.69 | 0.106 | 0.181 | 0.25 | 0.62 | 15 | 0.11 | 0.36 |
| Awash | 2011 | 0.79 | 0.4 | 0.10 | 0.74 | 0.114 | 0.341 | 0.34 | 0.62 | 16 | 0.08 | 0.30 |
| Awash | 2012 | 0.85 | 0.15 | 0.06 | 0.77 | 0.087 | 0.135 | 0.23 | 0.66 | 17 | 0.08 | 0.34 |
| Awash | 2013 | 0.89 | 0.81 | 0.08 | 0.73 | 0.099 | 0.081 | 0.21 | 0.61 | 18 | 0.15 | 0.56 |
| Awash | 2014 | 0.86 | -0.09 | 0.06 | 0.69 | 0.103 | 0.077 | 0.25 | 0.64 | 19 | 0.10 | 0.33 |
| Awash | 2015 | 0.83 | 0.05 | 0.06 | 0.70 | 0.104 | 0.074 | 0.26 | 0.64 | 20 | 0.12 | 0.38 |
| Awash | 2016 | 0.82 | 0.16 | 0.08 | 0.67 | 0.08 | 0.089 | 0.26 | 0.63 | 21 | 0.09 | 0.92 |
| Awash | 2017 | 0.90 | 0.31 | 0.06 | 0.64 | 0.102 | 0.099 | 0.23 | 0.62 | 22 | 0.26 | 0.87 |
| Global | 2003 | 2.57 | -0.46 | 0.01 | 0.34 | -0.021 | 0.073 | 0.03 | 0.59 | 6 | 0.03 | 0.03 |
| Global | 2004 | 2.6 | 0.01 | 0.01 | 0.33 | 0.117 | 0.061 | 0.03 | 0.49 | 7 | 0.03 | 0.05 |
| Global | 2005 | 2.25 | 0.64 | 0.02 | 0.48 | 0.126 | 0.105 | 0.25 | 0.43 | 8 | 0.04 | 0.08 |
| Global | 2006 | 2.31 | 0.12 | 0.02 | 0.66 | 0.115 | 0.158 | 0.20 | 0.57 | 9 | 0.04 | 0.08 |
| Global | 2007 | 1.54 | 0.41 | 0.02 | 0.69 | 0.118 | 0.253 | 0.36 | 0.50 | 10 | 0.05 | 0.10 |
| Global | 2008 | 0.85 | 0 | 0.02 | 0.70 | 0.112 | 0.364 | 0.54 | 0.51 | 11 | 0.05 | 0.10 |
| Global | 2009 | 0.96 | 0.3 | 0.02 | 0.73 | 0.1 | 0.028 | 0.45 | 0.51 | 12 | 0.05 | 0.13 |
| Global | 2010 | 0.84 | 0.22 | 0.02 | 0.69 | 0.106 | 0.181 | 0.49 | 0.44 | 13 | 0.08 | 0.20 |

| | | | | | | | | | | | | |
|--------|------|------|-------|------|------|--------|-------|------|------|----|--------|--------|
| Global | 2011 | 0.92 | -0.3 | 0.01 | 0.74 | 0.114 | 0.341 | 0.45 | 0.79 | 14 | 0.04 | 0.09 |
| Global | 2012 | 0.92 | 0.19 | 0.01 | 0.77 | 0.087 | 0.135 | 0.35 | 0.88 | 15 | 0.02 | 0.06 |
| Global | 2013 | 1.14 | 2.09 | 0.02 | 0.73 | 0.099 | 0.081 | 0.27 | 0.57 | 16 | 0.15 | 0.43 |
| Global | 2014 | 1.35 | 0.22 | 0.02 | 0.69 | 0.103 | 0.077 | 0.23 | 0.48 | 17 | 0.16 | 0.37 |
| Global | 2015 | 1.63 | -0.11 | 0.01 | 0.70 | 0.104 | 0.074 | 0.18 | 0.52 | 18 | 0.14 | 0.27 |
| Global | 2016 | 1.47 | 0 | 0.02 | 0.50 | 0.08 | 0.089 | 0.15 | 0.49 | 19 | 0.12 | 0.92 |
| Global | 2017 | 1.25 | -0.35 | 0.01 | 0.60 | 0.102 | 0.099 | 0.12 | 0.52 | 20 | 0.17 | 0.59 |
| Nile | 2003 | 1.04 | 0.06 | 0.16 | 0.56 | -0.021 | 0.073 | 0.05 | 0.60 | 6 | 0.10 | 0.24 |
| Nile | 2004 | 0.95 | -0.49 | 0.09 | 0.61 | 0.117 | 0.061 | 0.09 | 0.75 | 7 | 0.02 | 0.04 |
| Nile | 2005 | 0.84 | 0.28 | 0.10 | 0.65 | 0.126 | 0.105 | 0.17 | 0.72 | 8 | 0.04 | 0.12 |
| Nile | 2006 | 1.02 | -0.21 | 0.08 | 0.73 | 0.115 | 0.158 | 0.18 | 0.80 | 9 | 0.04 | 0.13 |
| Nile | 2007 | 0.88 | -0.16 | 0.06 | 0.75 | 0.118 | 0.253 | 0.18 | 0.86 | 10 | 0.02 | 0.09 |
| Nile | 2008 | 0.68 | 0.19 | 0.05 | 0.77 | 0.112 | 0.364 | 0.23 | 0.83 | 11 | (0.03) | (0.31) |
| Nile | 2009 | 0.72 | 1.25 | 0.12 | 0.75 | 0.1 | 0.028 | 0.22 | 0.69 | 12 | 0.02 | 0.09 |
| Nile | 2010 | 0.93 | 0.55 | 0.11 | 0.64 | 0.106 | 0.181 | 0.20 | 0.57 | 13 | 0.14 | 0.39 |
| Nile | 2011 | 0.96 | -0.15 | 0.09 | 0.65 | 0.114 | 0.341 | 0.18 | 0.71 | 14 | 0.10 | 0.28 |
| Nile | 2012 | 1.09 | 0.5 | 0.07 | 0.64 | 0.087 | 0.135 | 0.13 | 0.71 | 15 | 0.10 | 0.28 |
| Nile | 2013 | 1.11 | 0.01 | 0.05 | 0.65 | 0.099 | 0.081 | 0.15 | 0.73 | 16 | 0.11 | 0.31 |
| Nile | 2014 | 1.09 | 0.08 | 0.05 | 0.66 | 0.103 | 0.077 | 0.16 | 0.70 | 17 | 0.12 | 0.35 |
| Nile | 2015 | 1.15 | 0.27 | 0.06 | 0.63 | 0.104 | 0.074 | 0.15 | 0.69 | 18 | 0.09 | 0.23 |
| Nile | 2016 | 0.85 | -0.25 | 0.05 | 0.67 | 0.08 | 0.089 | 0.25 | 0.78 | 19 | 0.03 | 0.09 |
| Nile | 2017 | 0.83 | 1.23 | 0.06 | 0.63 | 0.102 | 0.099 | 0.29 | 0.76 | 20 | 0.14 | 1.06 |
| Nice | 2003 | 0.74 | 0.26 | 0.01 | 0.62 | -0.021 | 0.073 | 0.30 | 0.66 | 6 | 0.05 | 0.10 |
| Nice | 2004 | 0.77 | -0.36 | 0.01 | 0.65 | 0.117 | 0.061 | 0.30 | 0.72 | 7 | 0.02 | 0.07 |
| Nice | 2005 | 0.71 | -0.57 | 0.00 | 0.71 | 0.126 | 0.105 | 0.24 | 0.66 | 8 | (0.05) | (0.54) |
| Nice | 2006 | 0.73 | 4.38 | 0.02 | 0.68 | 0.115 | 0.158 | 0.20 | 0.65 | 9 | 0.06 | 0.20 |
| Nice | 2007 | 0.95 | 0.41 | 0.03 | 0.68 | 0.118 | 0.253 | 0.18 | 0.67 | 10 | 0.08 | 0.27 |
| Nice | 2008 | 0.93 | -0.22 | 0.01 | 0.67 | 0.112 | 0.364 | 0.16 | 0.68 | 11 | 0.06 | 0.17 |
| Nice | 2009 | 0.81 | 0.05 | 0.02 | 0.68 | 0.1 | 0.028 | 0.13 | 0.68 | 12 | 0.05 | 0.14 |
| Nice | 2010 | 0.99 | 0.35 | 0.01 | 0.70 | 0.106 | 0.181 | 0.09 | 0.73 | 13 | 0.06 | 0.20 |
| Nice | 2011 | 1.12 | -0.89 | 0.00 | 0.79 | 0.114 | 0.341 | 0.06 | 0.54 | 14 | 0.00 | 0.01 |
| Nice | 2012 | 1.05 | 48.16 | 0.04 | 0.75 | 0.087 | 0.135 | 0.05 | 0.59 | 15 | 0.17 | 0.70 |
| Nice | 2013 | 1.2 | 2.94 | 0.10 | 0.69 | 0.099 | 0.081 | 0.04 | 0.70 | 16 | 0.14 | 0.45 |
| Nice | 2014 | 1.12 | 0.09 | 0.10 | 0.74 | 0.103 | 0.077 | 0.05 | 0.68 | 17 | 0.07 | 0.26 |
| Nice | 2015 | 1.21 | 0.1 | 0.10 | 0.68 | 0.104 | 0.074 | 0.05 | 0.67 | 18 | 0.28 | 1.02 |
| Nice | 2016 | 1.07 | -0.59 | 0.04 | 0.72 | 0.08 | 0.089 | 0.05 | 0.65 | 19 | 0.10 | 0.92 |
| Nice | 2017 | 1.09 | 2.85 | 0.10 | 0.70 | 0.102 | 0.099 | 0.04 | 0.68 | 20 | 0.25 | 0.89 |
| Africa | 2003 | 1.36 | -0.28 | 0.08 | 0.60 | -0.021 | 0.073 | 0.06 | 0.58 | 9 | 0.08 | 0.19 |
| Africa | 2004 | 1.22 | -0.45 | 0.05 | 0.64 | 0.117 | 0.061 | 0.09 | 0.67 | 10 | 0.01 | 0.03 |
| Africa | 2005 | 1.12 | 0.07 | 0.04 | 0.68 | 0.126 | 0.105 | 0.05 | 0.73 | 11 | (0.00) | (0.41) |
| Africa | 2006 | 1.16 | 0.6 | 0.07 | 0.71 | 0.115 | 0.158 | 0.04 | 0.60 | 12 | 0.07 | 0.25 |

| | | | | | | | | | | | | |
|--------|------|------|--------|--------|------|--------|-------|------|------|----|--------|--------|
| Africa | 2007 | 1.08 | -0.63 | 0.02 | 0.75 | 0.118 | 0.253 | 0.05 | 0.81 | 13 | 0.02 | 0.08 |
| Africa | 2008 | 0.99 | 0.23 | 0.01 | 0.80 | 0.112 | 0.364 | 0.11 | 0.82 | 14 | 0.04 | 0.19 |
| Africa | 2009 | 0.94 | -0.02 | 0.02 | 0.79 | 0.1 | 0.028 | 0.18 | 0.83 | 15 | 0.05 | 0.23 |
| Africa | 2010 | 0.89 | 2.32 | 0.04 | 0.81 | 0.106 | 0.181 | 0.21 | 0.82 | 16 | 0.06 | 0.30 |
| Africa | 2011 | 0.83 | 0.37 | 0.05 | 0.82 | 0.114 | 0.341 | 0.30 | 0.82 | 17 | 0.05 | 0.30 |
| Africa | 2012 | 0.67 | 0.2 | 0.04 | 0.81 | 0.087 | 0.135 | 0.41 | 0.85 | 18 | 0.05 | 0.28 |
| Africa | 2013 | 0.54 | -0.09 | 0.01 | 0.78 | 0.099 | 0.081 | 0.36 | 0.85 | 19 | 0.06 | 0.28 |
| Africa | 2014 | 0.63 | -1.03 | (0.00) | 0.77 | 0.103 | 0.077 | 0.32 | 0.90 | 20 | 0.08 | 0.35 |
| Africa | 2015 | 0.36 | -21.7 | 0.01 | 0.67 | 0.104 | 0.074 | 0.30 | 0.81 | 21 | 0.07 | 0.22 |
| Africa | 2016 | 0.26 | (0.61) | 0.01 | 0.64 | 0.08 | 0.089 | 0.34 | 0.82 | 22 | 0.06 | 0.64 |
| Africa | 2017 | 0.72 | -0.39 | 0.00 | 0.68 | 0.102 | 0.099 | 0.31 | 0.80 | 23 | 0.22 | 0.41 |
| Nib | 2003 | 0.9 | 9.83 | 0.04 | 0.57 | -0.021 | 0.073 | 0.25 | 0.79 | 1 | 0.07 | 0.09 |
| Nib | 2004 | 0.74 | -1.17 | (0.01) | 0.61 | 0.117 | 0.061 | 0.22 | 0.84 | 2 | (0.10) | (0.26) |
| Nib | 2005 | 0.98 | -12.5 | 0.08 | 0.59 | 0.126 | 0.105 | 0.16 | 0.13 | 3 | 0.09 | 0.22 |
| Nib | 2006 | 1 | -0.19 | 0.06 | 0.59 | 0.115 | 0.158 | 0.13 | 0.17 | 4 | 0.05 | 0.12 |
| Nib | 2007 | 1.05 | 0.6 | 0.09 | 0.63 | 0.118 | 0.253 | 0.09 | 0.67 | 5 | 0.08 | 0.20 |
| Nib | 2008 | 0.86 | 0.43 | 0.10 | 0.74 | 0.112 | 0.364 | 0.14 | 0.66 | 6 | 0.11 | 0.43 |
| Nib | 2009 | 0.94 | 0.46 | 0.14 | 0.74 | 0.1 | 0.028 | 0.11 | 0.68 | 7 | 0.10 | 0.37 |
| Nib | 2010 | 0.98 | 0.27 | 0.11 | 0.75 | 0.106 | 0.181 | 0.11 | 0.66 | 8 | 0.09 | 0.38 |
| Nib | 2011 | 0.99 | 0.3 | 0.13 | 0.74 | 0.114 | 0.341 | 0.11 | 0.29 | 9 | 0.09 | 0.35 |
| Nib | 2012 | 0.97 | 0.26 | 0.09 | 0.78 | 0.087 | 0.135 | 0.09 | 0.30 | 10 | 0.09 | 0.41 |
| Nib | 2013 | 1.05 | 0.26 | 0.08 | 0.73 | 0.099 | 0.081 | 0.09 | 0.27 | 11 | 0.11 | 0.42 |
| Nib | 2014 | 1.12 | -0.03 | 0.07 | 0.70 | 0.103 | 0.077 | 0.09 | 0.30 | 12 | 0.11 | 0.37 |
| Nib | 2015 | 1.1 | 0.07 | 0.07 | 0.67 | 0.104 | 0.074 | 0.14 | 0.30 | 13 | 0.08 | 0.23 |
| Nib | 2016 | 1.06 | -0.07 | 0.07 | 0.65 | 0.08 | 0.089 | 0.15 | 0.28 | 14 | 0.06 | 0.62 |
| Nib | 2017 | 1.03 | -0.07 | 0.04 | 0.66 | 0.102 | 0.099 | 0.15 | 0.36 | 15 | 0.18 | 0.54 |
| Nyala | 2003 | 1.04 | -0.12 | 0.12 | 0.61 | -0.021 | 0.073 | 0.27 | 0.30 | 8 | 0.09 | 0.19 |
| Nyala | 2004 | 1.08 | -0.27 | 0.11 | 0.56 | 0.117 | 0.061 | 0.28 | 0.59 | 9 | 0.06 | 0.13 |
| Nyala | 2005 | 1.08 | 0.33 | 0.11 | 0.52 | 0.126 | 0.105 | 0.30 | 0.49 | 10 | 0.07 | 0.15 |
| Nyala | 2006 | 1.19 | -0.13 | 0.10 | 0.58 | 0.115 | 0.158 | 0.27 | 0.59 | 11 | 0.09 | 0.23 |
| Nyala | 2007 | 1.08 | 0.33 | 0.01 | 0.58 | 0.118 | 0.253 | 0.26 | 0.52 | 12 | 0.10 | 0.23 |
| Nyala | 2008 | 0.97 | -0.31 | 0.07 | 0.63 | 0.112 | 0.364 | 0.25 | 0.68 | 13 | 0.06 | 0.15 |
| Nyala | 2009 | 0.91 | 0.66 | 0.10 | 0.57 | 0.1 | 0.028 | 0.31 | 0.62 | 14 | 0.13 | 0.31 |
| Nyala | 2010 | 0.98 | 0.25 | 0.07 | 0.60 | 0.106 | 0.181 | 0.25 | 0.59 | 15 | 0.14 | 0.34 |
| Nyala | 2011 | 1.02 | 0.23 | 0.09 | 0.58 | 0.114 | 0.341 | 0.26 | 0.55 | 16 | 0.16 | 0.38 |
| Nyala | 2012 | 1.09 | 0.85 | 0.09 | 0.60 | 0.087 | 0.135 | 0.19 | 0.41 | 17 | 0.18 | 0.45 |
| Nyala | 2013 | 1.14 | 1.27 | 0.14 | 0.62 | 0.099 | 0.081 | 0.17 | 0.46 | 18 | 0.16 | 0.43 |
| Nyala | 2014 | 1.22 | -0.48 | 0.07 | 0.60 | 0.103 | 0.077 | 0.14 | 0.54 | 19 | 0.14 | 0.36 |
| Nyala | 2015 | 1.25 | 0.18 | 0.07 | 0.63 | 0.104 | 0.074 | 0.11 | 0.57 | 20 | 0.12 | 0.33 |
| Nyala | 2016 | 1.17 | 0.11 | 0.08 | 0.64 | 0.08 | 0.089 | 0.09 | 0.52 | 21 | 0.12 | 1.09 |
| Nyala | 2017 | 1.27 | 1.84 | 0.15 | 0.62 | 0.102 | 0.099 | 0.08 | 0.52 | 22 | 0.32 | 1.17 |

| | | | | | | | | | | | | |
|------|------|------|-------|------|------|--------|-------|------|------|----|--------|--------|
| Unic | 2003 | 1.29 | 0 | 0.07 | 0.56 | -0.021 | 0.073 | 0.02 | 0.49 | 9 | 0.08 | 0.14 |
| Unic | 2004 | 1.06 | -0.68 | 0.02 | 0.59 | 0.117 | 0.061 | 0.03 | 0.84 | 10 | (0.05) | (0.13) |
| Unic | 2005 | 1.02 | 0.2 | 0.02 | 0.59 | 0.126 | 0.105 | 0.03 | 0.81 | 11 | (0.02) | (0.04) |
| Unic | 2006 | 1.24 | 2.11 | 0.08 | 0.53 | 0.115 | 0.158 | 0.15 | 0.50 | 12 | 0.09 | 0.20 |
| Unic | 2007 | 1.11 | 0.17 | 0.09 | 0.60 | 0.118 | 0.253 | 0.14 | 0.72 | 13 | 0.10 | 0.25 |
| Unic | 2008 | 1.11 | 1.07 | 0.14 | 0.62 | 0.112 | 0.364 | 0.13 | 0.59 | 14 | 0.17 | 0.44 |
| Unic | 2009 | 1.03 | -0.43 | 0.07 | 0.69 | 0.1 | 0.028 | 0.12 | 0.77 | 15 | 0.05 | 0.15 |
| Unic | 2010 | 1.17 | 0.8 | 0.07 | 0.63 | 0.106 | 0.181 | 0.10 | 0.58 | 16 | 0.14 | 0.38 |
| Unic | 2011 | 1.19 | -0.11 | 0.06 | 0.65 | 0.114 | 0.341 | 0.08 | 0.71 | 17 | 0.09 | 0.25 |
| Unic | 2012 | 1.25 | 0.98 | 0.07 | 0.65 | 0.087 | 0.135 | 0.07 | 0.64 | 18 | 0.12 | 0.35 |
| Unic | 2013 | 1.27 | 0.52 | 0.07 | 0.62 | 0.099 | 0.081 | 0.09 | 0.54 | 19 | 0.17 | 0.46 |
| Unic | 2014 | 0.91 | 0.01 | 0.07 | 0.62 | 0.103 | 0.077 | 0.33 | 0.54 | 20 | 0.14 | 0.37 |
| Unic | 2015 | 0.73 | 0.14 | 0.07 | 0.56 | 0.104 | 0.074 | 0.45 | 0.52 | 21 | 0.13 | 0.30 |
| Unic | 2016 | 0.72 | -0.23 | 0.06 | 0.54 | 0.08 | 0.089 | 0.33 | 0.52 | 22 | 0.08 | 0.78 |
| Unic | 2017 | 0.70 | 0.25 | 0.05 | 0.60 | 0.102 | 0.099 | 0.43 | 0.53 | 23 | 0.22 | 0.57 |