Determinants of Insurance Business Development in Ethiopia

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Statement of Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university and that all sources of materials used for the thesis have been dully acknowledged.

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Statement of Certification

This is to certify that Zewge Daniel Assefa has carried out his research work on the topic entitled "Determinants of Insurance Business Development in Ethiopia" under my supervision. This work is original in nature and it is suitable for submission for the award of the degree for Masters of Science in Accounting and Finance.

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Thesis advisor

This is to certify that this thesis prepared by Zewge Daniel entitled "Determinants of insurance business development in Ethiopia" and submitted in partial fulfillment for the requirement for the degree of masters in Accounting and Finance complies with the regulation of the university and meets the accepted standards with respect to originality and quality.

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Abstract

Determinants of insurance business development in Ethiopia

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This study examines the economic and demographic determinants of insurance business development in Ethiopia. The study adopted the autoregressive distributed lag (ARDL) regression model on 38 annual secondary time series data covering the period from 1980 to 2017. The finding of the study shows that income, economic growth, financial development, urbanization, and trade openness have a positive and statistically significant relationship with life insurance business development. On the other hand, inflation has a negative and statistically significant relationship with life insurance demand. Further, regarding the non-life insurance, the study finds that the variable income, trade openness, and urbanization has a positive and statistically significant influence and inflation has a negative and statistically significant impact. The study suggests that insurance companies and other participants of the insurance industry should have considered these factors toward enhancing the level of the country's insurance business development.

Keywords: life insurance, non-life insurance, insurance business development, insurance in Ethiopia

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Acronym

ARDL	Autoregressive distributed lag
CEE	Central and East Europe
CSEE	Central and southeast Europe
DR	Dependency ratio
ECM	Error correction model
EIP	Ethiopian Insurance Corporation
FID	Financial development
ETB	Ethiopian Birr
GDP	Gross domestic product
GIP	Gross insurance premium
IMF	International monetary fund
NBE	National bank of Ethiopia
UNCTAD	United nation conference on trade and development
URB	Urbanization
LP	Life premium
NLP	Non-life premium
M2	Broad money definition
OECD	Organization for economic cooperation and development
OLS	Ordinary least square

TO	Trade openness
US	United nation
SCF	Survey of consumer finances

Chapter one

1.1. Background of the study

Financial markets perform the essential economic function of channeling funds from households, firms, and governments that have saved surplus funds by spending less than their income(surplus units) to those that have a shortage of funds because they wish to spend more than their income (deficit unit). The financial market has an important function in the economy. They allow funds to move from people who lack productive investment opportunities to people who have such opportunities. Financial markets are critical for producing an efficient allocation of capital which contributes to higher production and efficiency for the overall economy (Mishkin, 2016). As financial intermediary insurance companies perform the same type of functions and provide similar generic benefits to a national economy as other financial intermediaries (Skipper& Kwon, 2007).

Under the Ethiopian proclamation number 746/12, insurance is defined as, an activity by an insurer to indemnify another person, in exchange for consideration called premium, against damage, destruction, loss or liability in respect of a certain risk or peril to which the object of the insurance may be exposed or to pay a sum of money or another thing of value depending upon the happening of a certain event.

The main concept of insurance is that of spreading risks. As a risk transfer mechanism, insurance provides financial protection from unpredictable losses. Today's world is full of risk and uncertainty. This risk and uncertainty are created due to globalization, liberalization, and innovation in science and technology. Insurance is a way to minimize and provide protection against those risks which are beyond human control. It is a way to indemnify to those unpredictable losses (Pant, (2017).

Although insurance contracts generate transaction costs and also information costs, at the macroeconomic level, the insurance industry contributes to the formation of national income. The service offered by the insurer is that of an intermediary and the cost of insurance, which measures the effort made by the community to provide itself with an insurance system, generates the payment of salaries, commissions, and dividends (Outreville, 1998).

Insurance makes a remarkable contribution to society as a whole. It creates certainty in the business environment thereby stimulating competition among business firms. Insurers induce firms to set -up loss prevention and reduction measures to prevent and minimize losses. Inefficiencies tend to disappear because of the adverse reaction to risk by individuals or firms is eliminated or reduced. The risks are pooled and managed by the insurer who has specialized knowledge in the field. All these measures, in the final analysis, lead to efficient utilization of resources in the society (Zeleke, 1999).

There is a long-held view that insurance market activities promote economic growth through the financial intermediation role of mobilizing long term funds for financial markets (Alhassan & Biekpe, 2016). According to Erik et al (2011), insurance facilitates investment by reducing the amount of capital that businesses and individuals need to keep at hand to protect themselves from uncertain events. The insurance sector plays a critical role in financial and economic development. By introducing risk pooling and reducing the impact of large losses on firms and households, the sector reduces the amount of capital that would be needed to cover these losses individually, encouraging additional output, investment, innovation, and competition. Through introducing risk-based pricing for insurance protection, the sector can change the behavior of economic agents, contributing to the prevention of accidents, improved health outcomes, and efficiency gains. As financial intermediaries with long investment horizons, the life insurance business can contribute to the provision of long-term finance and more effective risk management. Moreover, the sector can also improve the efficiency of other segments of the financial sector, such as banking and bond markets, i.e. by enhancing the value of collateral through property insurance and reducing losses at default through credit guarantees and enhancements.

The insurance industry has largely contributed to our complex and sophisticated economy, without insurance contracts, the business would be more difficult and costly, and a great part of them would probably never take place. Also, the economy would lag behind its potential, the wealth of nations would be sharply reduced, and social unity would fall apart. In short, as far as ordinary life is concerned, individuals would be much more cautious in all that they do, probably even cancel some of their risky activities. Therefore, it can be said that the insurance scheme is almost as indispensable to the functioning of modern society as is the legal system that protects both companies and individuals against any risk (Abbas and Ning, 2016).

According to Brokešová and Vachálková, (2016) changes in the macroeconomic situation added to the growth of economic advancement and caused an increase in the effective demand and the incomes and wealth of individual subjects of countries. This, in turn, enabled the use of modern technological processes in the economy and raised the consumption of basic and luxurious goods and services, including insurance. Consequently, the prerequisites for the development of the insurance sector would be created. In addition, based on theoretical studies, the economic development of a country is one of the most significant determinants influencing the structure, size and overall development of the insurance sector (Kafková and Kracinovsky, 2008; Tipurić et al., 2008). In line with this, if individuals do not have a sufficient economic and financial level and the overall standard of living is low, the insurance business will not prosper either. Consequently, when the standard of living improves, the wealth of the people grows, as does the level of education and the demand for insurance, as the financial means accumulate and in turn boost the economic growth of the country (Brokešová and Vachálková, 2016).

Despite the critical role that the insurance sector may play for financial and economic development and reasonable evidence that the sector has promoted economic growth, there have been few studies examining the factors that drive the development of the insurance sector (both life and non-life) particularly in emerging countries like Ethiopia. Moreover, even if there are studies conducted on the area of insurance, the bulk of the existing empirical research focuses on the growth of the life sector. Based on this, this study seeks to investigate which economic and demographic factors are/is an important determinant of insurance market growth (both life and non-life insurance) in Ethiopia by empirically regressing the annual gross insurance premium of the life and non-life insurance on the selected economic and demographic variables and to identify the factors that have a significant and potential influence on the growth of the insurance business by analyzing the effect of the selected explanatory variables on life and non-life insurance business separately.

1.1.1. Insurance business in Ethiopia

The history of the insurance business is as far back as the 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 was 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 was classified as trade and was administered by the provisions of the commercial code.

According to Hailu Zeleke (2007), the first significant event that the Ethiopian insurance market observed was the issuance of Proclamation No. 281/1970 and this proclamation was issued to provide for the control & regulation of insurance business in Ethiopia. Consequently, it created an insurance council and an insurance controller's office. The controller of insurance licensed 15 domestic insurance companies, 36 agents, 7 brokers, 3 actuaries & 11 assessors in accordance with the provisions of the proclamation immediately in the year after the issuance of the law.

Accordingly, as stated by the office mentioned above, the law required an insurer to be a domestic company whose share capital (fully subscribed) not to be less than Ethiopian Birr 400,000 for a general insurance business, Birr 600,000 in the case of long-term insurance business and Birr 1,000,000 to do both long-term & general insurance business. The proclamation defined 'domestic company' as a share company having its head office in Ethiopia and in the case of a company transacting a general insurance business at least 51% and in the case of a company transacting life insurance business, at least 30% of the paid-up capital must be held by Ethiopian nationals or national companies.

After four years that is after the enactment of the proclamation, the military government that came to power in 1974 put an end to all private enterprises. Then all insurance companies operating were nationalized and from January 1, 1975, onwards the government took over the ownership and control of these companies & merged them into a single unit called Ethiopian Insurance Corporation. In the years following nationalization, Ethiopian Insurance Corporation became the sole operator. After the change in the political environment in 1991, the proclamation for the licensing and supervision of insurance business heralded the beginning of a new era.

Immediately after the enactment of the proclamation in 1994, private insurance companies began to be estabilished.

1.2. Statement of the problem

In many countries, the insurance sector contributes to economic growth both sectorally and geographically. Since the insurance sector has links to other economic sectors such as industrial, transportation, agriculture, trade, and others, both locally and internationally, its relevance to general human activities have continued to grow for all ages as for all categories of risks increase **(**Zyka and Myftaraj, 2014).

Supported by the ever-expanding financial sector, Ethiopia has registered significant economic progress for a decade and the International Monetary Fund (IMF) estimated its real Gross Domestic Product (GDP) is increased by 9% in the 2016/17 fiscal year. Similarly, following country's socio-economic growth, the insurance business has witnessed rapid expansion as the opening of the sector to domestic private investors and currently, these private insurance companies continued their fierce competition for better market share. Furthermore, Ethiopia's insurance industry has been playing a growing role in long term economic progress and improving living standards by channeling household savings from a large portion of the population into productive investments. The sector also promotes economic advancement through its unique funding channels and investments as well as providing sizable job opportunities (The Ethiopian Herald, 2017). In addition, the data obtained from NBE shows that, Ethiopia’s insurance industry premium volume grew by 16.67% to ETB 7.27 billion in 2017 from ETB 6.232 billion in 2016, and also the industry’s insurance density, which meusres per individual annual insurance consumption, was increased by 14.84% from ETB 68.33 in 2016 to ETB 78.47 in 2017.

The above facts show that insurance business in Ethiopia has shown remarkable growth as measured by its annual insurance premium mainly following the issuance of proclamation no. 86/1994 that allows domestic private companies to engage in the insurance business. However, despite this the industry level of insurance penetration rate (i.e. the ratio of written premium to GDP) that represents the contribution of the insurance industry to the national economy and the insurance density (i.e. ratio of written premium to the total population i.e. insurance per capita) which represents the level of per individual citizens annual insurance consumption are still low in Ethiopia. According to NBE data, the industry's aggregate contribution to national GDP (i.e. the penetration rate) is around 0.5 percent, which is less than 1% and the insurance density is Br. 78 in 2017. This status depicts the low level of insurance development in Ethiopia from some African countries. For instance, in neighboring Kenya insurance penetration is 2.83 percent and in South Africa, it is 17 percent, Nambia 6.69%, Lesotho 4.76%, and Zimbabwe 4.09% and Rwanda 1.74% (statista.com, 2017). This shows that the country insurance business contribution to the national economy as compared with other African countries is small which calls for serious attention. This means that the level of development of the insurance sector of the country can be said as it is in its emergent stage. Thus, there may be some factors that have affected the growth of the insurance market which requires an investigation.

With this regard, most of previous literatures confirm that insurance business is sensitive and highly correlated with the macroeconomic environment. For instance, Mashayekhi and Fernandes (2007) suggest that the insurance sector is closely linked with macroeconomic factors (e.g. inflation, currency controls and the national income of a country), regulation and supervision, and the achievement of national development objectives, as well as the international trade regime. In addition, Faugère and Erlach, (2003) concluded that growth in gross written premiums is among the key insurance variables which are highly correlated with the macroeconomic environment. Further, Čepeláková, (2015) conducted on the impact of the macroeconomic environment on insurance companies of 29 countries and find evidence that macroeconomic determinant (i.e. economic, institutional and demographic factors) can significantly influence insurance business growth of countries. Elango and Jones (2011) also examined factors that derive the insurance demand of emerging countries and the study finding indicates demographic, economic and institutional variables are the factors that can have a greater effect on insurance demand although their level of influence is not the same. Further, Dragos (2014) conducted on the factors that influence the demand for life and non-life insurance in emerging countries from Europe and Asia. The study finds that urbanization, income, and their distribution and the population degree of education are the relevant factors for the development of the insurance sector.

With this fact, even if all the previously mentioned studies and other related literature confirms that the macroeconomic environment has a significant impact on insurance sector development of developed and developing countries none has exclusively explained the determinants of insurance sector development in Ethiopia. Up to the researcher's knowledge there are few researchers that have tried to show the relationship between the macroeconomic factors and insurance demand in Ethiopia but these studies were tried to examine the factors with regard to life insurance demand only and no one of these studies done in Ethiopia tried to show the relationship between the macroeconomic variables and the non-life insurance demand in Ethiopia. Among these studies, for instance, Amrot (2014) examined the determinants of life insurance demand in Ethiopia by using a time series data from 1983 to 2012. Sulaiman et al (2015) investigated the factors that influence the life insurance market in Ethiopia using a time series data from 1979/80 to 2007/08. In addition, Ayaliew (2013) examined the factors that affect the development of the life insurance industry in Ethiopia for a time series data for the period 1991-2010. And also, Meko et al (2019) investigated the determinants of life insurance demand in Ethiopia by using the balanced panel data model to examine the determinants of life insurance demand using data collected from four insurance companies for sixteen years, from 2001-2016.

Based on this, this study aims to investigate the factors that have a potential and significant influence on insurance business development (both the life and non-life insurance business) in Ethiopia by estimating (analyzing) the different effect of the selected economic and demographic factors on life and non-life insurance sector separately. By doing so, the study fills the gap existed in the empirical literature by investigating the factors that drive growth of both the life and non-life insurance business that has not been done by other previous researchers in Ethiopia and through extending the period of investigation as well as by introducing some additional new explanatory variables that were not included in previous studies that were conducted in Ethiopia.

1.3. The objective of the study

1.3.1. General objective

The general objective of the study is to examine the factors that determine insurance business development in Ethiopia.

1.3.2. Specific objective

In relation to the general objective of the study, the researcher aims to achieve the following specific objectives. These specific objectives are;

1. To examine the impact of GDP per capita on insurance business development in Ethiopia**.**
2. To find out the effect of economic growth on insurance business development in Ethiopia.
3. To confirm the impact of inflation on insurance business development in Ethiopia.
4. To determine the effect that trade openness has on insurance business development in Ethiopia.
5. To examine the impact of financial development on insurance business development in Ethiopia.
6. To determine whether insurance business development is influenced by urbanization in Ethiopia.
7. To find out the effect of dependency ratio on insurance business development in Ethiopia.

1.4. Research hypothesis

After a brief review of the previous theoretical and empirical studies related to insurance demand, the researcher formulates the assumed hypothesis of each explanatory variables of the study as follow:

GDP per capita: The substantial relationship between the total output in the economy and the growth in the insurance sector was affirmed by several authors (Esho et al. 2004; Beck & Webb 2003; Outreville 1996). The results show that along with the higher GDP is the insurance growth greater for both life and non-life sector. This is because usually with increasing income, individuals spend more money to meet their needs and buy goods and services such as houses and vehicles that need to be insured. The greater demand for non-life insurance is therefore created. Moreover, the increasing income might be the reason why people direct a part of their earnings towards retirement and buy insurance products related to investment then the life insurance demand grows (Beck & Webb 2003). Based on this, this variable is hypothesized as follow:

H_1: *GDP per capita has a significant and positive impact on insurance business development in Ethiopia.*

Economic growth*:* when an economy grows through producing more goods and services, consumers have more disposable income which to purchase assets. As they purchase more valuable assets, they are likely to consider the risk of damage and /or loss to those assets and therefore set aside more to secure their assets through insurance. outreville (1992) proposes that in principle and all other things being equal as the level of economic development of a country increases, the volume of business increases and the capacity of the insurance company to supply service also increases. In addition, Christophersen and Jakubik, (2014) also suggest that there is a strong link between gross written premium and economic growth. Based on the above facts this variable is hypothesized as follow:

H2: *Economic growth affects insurance business development positively and significantly in Ethiopia.*

Dependency ratio: An empirical study by Hammond et al (1967) found that one of the main purposes of life insurance is to protect dependents against financial hardship in the case of the wage earner's premature death. This is consistent with the findings of Lewis (1989), Beenstock, Dickinson, and Khajuria (1986) and Truett and Truett (1990) have provided empirical evidence that the consumption of life insurance and the number of dependents in a country are positively related. This is hypothesized as follow:

H3: *Dependency ratio influence insurance business development positively and significantly in Ethiopia.*

Financial development: Insurance demand depends significantly on the financial development of the country. When the ratio M2/GDP increases, the demand for insurance increases significantly. Measurement of financial development seems controversial because countries differ in their institutional environment and have different financial structures according to their development stage Outreville (1990). For this study, we use broad money to GDP ratio (M2/GDP) as a measure of financial development and we expect a positive and significant relationship with the insurance premium. This variable is hypothesized as follow:

H4: *Financial development affects insurance business development positively and significantly in Ethiopia.*

Inflation: macroeconomic stability plays an important role in the development of the insurance market. An unstable economic environment can result not only in lower disposable incomes but is also associated with higher inflation, increased uncertainty for the insurer and the insured. Inflation leads to higher claims' costs thereby eroding profitability. Inflation negatively affects the insurance growth as demonstrated by several authors in the empirical literature (Beck & Webb (2003); Outreville (1996), Poposki et al (2015)) inflation is often accompanied by rising interest rates, which reduce the value of guarantees of return. Rising inflation can have a negative effect on insurance demand and may lead to policyholders canceling their policies as well as increasing costs for insurers. In the case of deflation, or if very low inflation persists, interest rates tend to fall Poposki et al (2015).

H5: *Inflation influence insurance business development negatively and significantly in Ethiopia*.

Urbanization: The development of life insurance is related to a country's urbanization status and a higher degree of urbanization is likely to increase life insurance sales (Hammond et al (1967); Neumann, S. (1969); Outreville, 1996)). With regard to non-life (Browne et al (2000); Park and Lemaire (2012)) found an ambiguous impact while Esho et al. (2004), and Feyen et al. (2011) found a positive impact of urbanization on non-life insurance consumption. The hypothesis with regard to this variable will be as follow:

H6: *Urbanization has a positive and significant effect on insurance business development in Ethiopia.*

Trade openness: Petkovski and Jordan (2014)) find that trade openness is significant, suggesting that more open countries accumulate more insurance assets. Therefore in this study trade openness is hypothesized as follow

H7: *Trade openness affect insurance business development positively and significantly in Ethiopia.*

1.5. Significance of the study

The major objective of the study is examining the impact that the macroeconomic and demographic factors have on insurance business development in Ethiopia and it is expected that the result from the study can be used as an important guide for insurance companies, policymakers, and other stakeholders working to improve the insurance business. Further, The findings of the thesis are useful for insurance companies in developing their existing markets and/or choosing new potential markets. For policymakers, understanding the drivers of life and non-life insurance premium may help adjust their regulations to assist the development of the insurance business, which is an important engine for long-run economic growth and prosperity. The research finding will also help the stakeholders in the insurance sector as guidance and to understand and consider the factors that influence the business before and at the time making decisions and before and during the formulation of important policies and strategies. Finally, the thesis can become an important source and guide for those who have the interest to study the area of insurance business and related areas in Ethiopia.

1.6. Scope of the study

The study focuses on examining the factors that potentially determine insurance business development (of both the life and the nonlife insurance business) in Ethiopia. The dependent variable i.e. insurance business development is measured by gross annual insurance premium (GIP) of the industry. As an independent variable, the researcher selects only the demand leading external factors of some economic (GDP per capita, economic growth rate, financial development, inflation, and trade openness) and demographic (urbanization, and dependency ratio) variables. The justification behind selecting these variables is due to the availability of data and these variables were commonly examined in most of the previously conducted studies. Since these economic and demographic factors may have different impact and implications with respect to life and non-life insurance, the researcher was analyzed the effect of the selected economic and demographic variable on each line of the insurance business separately. Finally, to achieve the objective of the study the researcher uses 38 years of annual secondary time series data which covers the period 1980 up to 2017.

1.7. Limitation of the study

One of the limitations of this research may be the small number of variables data set. The researcher is unable to obtain data on life and non-life insurance prior to 1980 thus, restricting the annual sample size to 38 (from 1983-2017). Because the time is not substantially long, the question of whether the results suffer from small sample bias may arise. Further, this thesis examined only the effect of demand leading external factors (selected economic and demographic factors) on insurance business development in Ethiopia. However, there may be other industry and company-specific factors (supply leading) that can have potential and significant influence on the development insurance business and the researcher has not included them as an explanatory variable of this study. Due to this fact, the finding and the conclusion drawn in this study may be inconclusive because these factors may have their own potential influence in the country's insurance business. This may be the other limitation of the thesis.

1.8. Organization of the paper

For a systematic and scientific approach, this research work was divided into five chapters. Based on this, the first chapter introduces the research subject briefly and outlines the research background, incorporating the problems and results from past studies. The problem statement is given and research objectives have been clearly described. Furthermore, significance, scope, limitations, and hypothesis of the study are also included. In chapter two, both relevant theoretical and empirical literature is discussed. The methodology of the research is presented in chapter three. Chapter four concentrates on the presentation, analysis, and discussions of the data. The last chapter i.e. Chapter five presented conclusions of the study and forwarded recommendations based on the findings of the study.

Chapter two

Literature review

Introduction

This chapter consists of three sections. The first section (2.1.) deals with insurance-related theoretical studies, section (2.2.) discusses previous empirical literature on the area of insurance and the last secton (2.3) presents the possible determinants of insurance business development.

2.1. Theoretical Literature review

The theoretical model explaining the demand for insurance was first developed by Yaari (1964). Yaari (1964) showed that insurance demand is dependent on the allocation process of the consumer during his whole life. In his life-cycle approach, Yaari (1964) worked with the issue of uncertainty of a consumer's life span. He proved that the consumer's lifetime utility function is influenced by the time of the individual's death, his preference to bequeath income for dependents and to direct a part of his earnings towards retirement. The lifetime utility function of a consumer is maximized by a direction of prices (containing insurance premiums) and by a direction of interest rates. This approach assumes that the insurance demand is dependent on interest rates, expected earnings of individual during his life, wealth and the price for insurance products.

Mossin"s (1968) model also led to the prediction that insurance would be an inferior good i.e. that the rich backed by greater funds would be more likely to self-insure and demand less insurance cover. Wealth and income are however correlated with many other factors related to insurance demand. For example, wealthier people tend to have greater assets at risk and due to their lifestyle faces different levels of risk. Wealthier people may also have different attitudes towards risk and a different level of education about risk and insurance.

Smith's (1968) theoretical model of the demand for property insurance by individuals implicitly assumes that individuals are able to form correct estimates of the probabilities associated with all possible loss outcomes. In his analysis, factors which are important determinants of insurance consumption include wealth, the probability of loss, the price of insurance, the value of the item exposed to risk, and the utility function of the individual considering the purchase of insurance. Smith finds that when the price of insurance per dollar of coverage is less than one and the probability of no loss is greater than zero the optimal insurance purchasing decision may entail either purchasing or not purchasing coverage. Given a particular price of insurance, utility maximization suggests that an individual is more likely to self-insure the lower the probability of loss. In contrast, given a fixed probability of loss an individual is more likely to insure the lower the price of insurance. Insurance purchases are also theorized to be positively linked to the value of the item at risk, other things equal.

Lewis (1989) extended the model of Yaari (1964) by allowing the preferences of beneficiaries and dependents. In other words, he included also other members of the household in his model, not just the main earner as in the approach of Yaari (1964). He suggests that the probability of the main earner's death and the risk degree are positively correlated with the life insurance demand. Respectively, the household's wealth and policy-loading factor are negatively linked with the insurance demand. However, there are many other factors driving insurance consumption. Among the most substantial belong price of insurance, the stability of the monetary system, development of banking and market sector, urbanization or corruption control. In the approach of Lewis (1989), these determinants could be expressed by the policy-loading factor because they are supposed to influence the insurance costs.

Insurance demand theory based on the expected utility paradigm [Mossin (1968) and Szpiro (1985)] suggests that an individual's purchase of insurance depends on a number of different factors. These factors include the individual's income and wealth, the price of insurance, the individual's degree of risk aversion, and the probability of loss (Browne et al 2000, p76).

2.2. Empirical literature review

In this section, the researcher tries to present previously studied empirical researches that have been conducted on the area of insurance demand of life and non-life insurance business and in related areas.

Sherden (1984) was the first to focus on the sensitivity of non-life insurance purchase. In a cross-sectional analysis of consumption patterns limited to automobile insurance in 359 townships in the state of Massachusetts in 1979, the researcher finds that the demand for motor insurance is generally inelastic with respect to price and income and that the demand for comprehensive and collision coverage increases substantially with increased population density.

Beenstock et al (1988) examined the relationship between property-liability insurance premiums and income, found that marginal propensity to insure i.e., increase in insurance spending when income rises by 1$, differs from country to country and premiums vary directly with real rates of interest. Again, the decision of consumer and his/her initial wealth status are significant factors also when short run or long run consumption of insurance is considered. In addition, based on a cross-sectional logarithmic model of non-life insurance penetration of 55 developing countries, Outreville (1990 a) confirms the Beenstock, Dickinson, and Khajuria (1988) main result of an income elasticity greater than unity. He also noted that the level of financial development is the only other factor found to significantly impact non-life insurance consumption. In another study, Outreville (1990b) studied the economic significance of the insurance market in developing countries. Under this study the researcher studied the relationship between property-liability insurance premiums and economic and financial development with a cross-section of 55 developing countries and finds that economic growth and level of financial developments are the significant factors leading to increase property-liability insurance consumption of countries whereas price of insurance, agricultural status of the country, human capital endowment and monopolistic insurance market are insignificant to influence the demand for property-liability insurance in these countries.

Truett and Truett (1990) conducted on the demand for life insurance in Mexico and the United States identified that age, education, and level of income affect the demand for life insurance and that the income elasticity of demand for life insurance is much higher in Mexico than in the United States. Browne and Kim (1993) also examined the factors that lead to variations in the demand for life insurance across countries. They find that life insurance is positively correlated with national income and wealth, dependency ratio and negatively correlated with inflation in all the models. Life expectancy was not significant in any of the models. Whereas the variable Muslim is negative in all of the models and statistically significant in two which suggest that other things being equal, life insurance consumption is less in predominantly Islamic countries. The education variable is positively and significantly related to premiums in the 1980 life insurance in force model but not significant in either of the other two models.

Browne et al (2000) examined the factors that make a variation in property liability insurance consumption across countries belonging to the OECD. The study focuses on two lines of insurance: motor vehicle and general liability. The authors' analysis indicates that economic conditions affect the demand for insurance differently across lines of coverage. In particular, the authors' results suggest that income has a far greater effect on motor vehicle insurance consumption than on general liability insurance consumption. The authors find evidence that several factors are important in explaining the purchase of both kinds of insurance. These factors include income, wealth, the percent of a country's insurance market controlled by foreign firms, and the form of the legal system in the country.

Beck and Webb (2003) conducted a research on 68 countries of the world, with the intent to investigate what drives the large variance in life insurance consumption across countries. Four different measures of life insurance consumption and incorporate various economic, demographic and institutional factors were used in their research. Accordingly, they found that countries with high income per capita level, more developed banking sector, and lower inflation have a tendency to consume larger amounts of life insurance. In addition, life insurance consumption is observed to be positively influenced by private savings rate and real interest rate. However, factors such as education, life expectancy, young dependency ratio and size of social security did not appear to be robustly associated with life insurance consumption. Moreover, Hwang and Gao (2003) conducted on the determinants of demand for life insurance in the case of China. The study has found that several significant factors which have influenced people in China to purchase life insurance products in the past decade are directly related to the increase in the level of income, the increase in education levels, and the change in the social structure (such as family structure and urbanization). However, the research fails to show the negative effect of inflation on the life insurance demand in China, even China experienced high inflation in the mid-1990s.

Zhang and Zhu (2005) conducted a study in China, using data for 225 cities, which examines the determinants of China's insurance development, measured by premium volume, insurance density, and insurance penetration. Their results reveal that foreign direct investment is more significant for the property than for life insurance. Per capita GDP is the only variable significant for all measures of life consumption, while the total population, savings deposit, education attainment, telephone ownership per capita, social welfare expenditure, and young dependency are significant for life premiums. Variables such as wage level, savings deposit, and investment in fixed assets, report their significant effect on the demand for property insurance.

Hwang and Greenford (2005) examined the key factors that affect life insurance consumption in mainland China, Hong Kong, and Taiwan. In addition, the study was aimed to gain an understanding of the different characteristics of the market in life insurance in each territory. In the study income and demand for life insurance have a strong relationship. Education is also found to be a significant factor to influence life insurance consumption in that region. But Price and levels of social security are found to be insignificant relation with life insurance consumption. Further, the one-child policy in mainland China has a negative effect on life insurance consumption and differences in the level of economic development reveal a variation in life insurance consumption. Generally, the study concludes that the more advanced the economy, the greater the life insurance consumption would be. However, mainland China, which is a low-income country, shows the greatest potential of consuming life insurance products.

Li et al (2007) examined the determinants of life insurance consumption in OECD countries. They find a significant positive income elasticity of life insurance demand. In addition, their study suggests that demand increases with the number of dependents and level of education, and decreases with life expectancy and social security expenditure and also the country's level of financial development and its insurance market's degree of competition appear to stimulate life insurance sales, whereas high inflation and real interest rates tend to decrease life insurance consumption. Overall, they noted that life insurance demand is better explained when the product market and socioeconomic factors are jointly considered.

Celik and Kayali (2009) studied the determinants of demand for life insurance in a cross section of 31 European countries. In the study, income is found as the principal variable which affects life insurance consumption. In addition, while the impact of population and income on demand for life insurance is positive, education level and inflation inversely affect the demand for life insurance.

Elango and Jones (2011) focused to understand what factors drive the demand for insurance, measured by insurance density and premium growth rate, in emerging markets using panel data during the years 1998-2008. Their finding indicates that demographic factors explain a greater variance relative to economic and institutional variables for insurance density, while economic factors explain the greatest amount of variance in terms of insurance growth rates. Munir et al (2012) studied the impacts of macroeconomic & demographic variables on demand for life insurance consumption in Pakistan. Based on this, the study found that among the economic variable's financial development, gross savings, income level affect life insurance consumption positively whereas the price of insurance is inversely linked with life insurance demand. In addition, the demographic variables of crude birth rate, crude death rate, old age dependency ratio, urbanization also have a positive relationship with life insurance demand in that country.

Ayaliew, A. G. (2013) examined the factors that affect the development of the life insurance industry in Ethiopia for a time series data for the period 1991-2010. Accordingly, the study concludes that life insurance demand is determined by factors such as per capita income, life expectancy, real interest rate, and inflation. Finally, he suggested that the life insurance industry in Ethiopia seriously consider these factors in order to bring a significant contribution to the growth of the country's insurance industry. There is also another study conducted by Amrot (2014) on determinants of life insurance demand in Ethiopia. The researcher used a time series data from 1983-2012 on six selected variables (i.e. income, inflation, and real interest rate, level of education, life expectancy, and dependency ratio). The OLS regression result of the study shows that income, inflation, life expectancy, education, and real interest rate are the factors that significantly influence demand for life insurance in Ethiopia but in the study, dependency ratio has found no significant influence on demand for life insurance.

Petkovski & Jordan (2014) examined the determinant of non-life insurance consumption in 16 countries in Central and South-Eastern Europe (CSEE) during the period 1992-2011. The study finds that non-life insurance penetration increase with higher per-capita income and the number of passenger cars per 1,000 people, which have positively and significantly influence of non-life insurance consumption in 16 countries in the CSEE. They also find that trade is significant, suggesting that more open countries accumulate more insurance assets. Also, the results from other institutional factor underline the importance of the rule of law in non-life insurance consumption. Therefore, it is worth noticing that the protection and enforcement of property rights will facilitate the demand for non-life insurance policies. However, some of the initial variables such as financial development, education and inflation do not have a statistically significant influence on demand for non-life insurance.

Dragos (2014) studied on the different factors that influence life and non-life insurance demand in emerging countries from Asia and Europe. The researcher used panel data of 17 emerging economies on a 10-year period. Its findings indicate that income would be the significant and positive determinant of non-life insurance demand in CEE countries but it is insignificant for life insurance demand and in Asian countries. Urbanization has positive influence in Asian countries life insurance demand but not in the CEE countries but it is significant for non-life insurance demand in both regions. In addition, education was found significant only for non-life insurance in both regions whereas income distribution affects both regions insurance demand negatively. In line with this Zyka and Myftaraj (2014) conducted on factors affecting the insurance sector development in Albania over the period 1999 to 2009. By applying a co-integration regression analysis this study finds that population size, economic growth, urbanization, and paid claims are the factors that have a positive impact on the aggregate insurance premium of the country. Further, they justify that because these variables affect the culture of the population to use insurance products (all increases the level of demand for insurance) leads to an increase in the premium level. However, in the study market share of the largest company will negatively affect the level of premiums suggest that if one company holds a high market share there is a tendency to monopoly which reduces competition in the market.

Poposki et al (2015) studied on the determinants of non-life insurance consumption in 8 countries from SEE using time series data from 1995 to 2011 by applying the co-integration and panel vector error correction model. They discover that the number of passenger cars per 1,000 people, GDP per capita and inflation are significant predictors of non-life insurance penetration.

Sulaiman et al (2015) investigated the factors that influence the life insurance market from Ethiopia perspective. It employs secondary data on eleven independent variables – six of which are economic and five demographic variables for a period of 28 years from 1979/1980 to 2007/2008. The error correction mechanism (ECM), the Johansen co-integration test and the Augmented Dickey-Fuller test were utilized in its econometric analysis. The result shows a long-term balanced connection between the variables. Inflation had a statistically noticeable negative impact on the demand and supply in the life insurance market. In addition, there was a statistically significant negative effect of young dependency ratio on life insurance market demand while the old dependency ratio had a statistically significant positive relation to life insurance supply.

Abbas and Ning (2016) conducted their study on the factors that derive the development of insurance industry in Tanzania. The study applied an OLS regression method based on 20-year time series data. Their study suggests that there is a strong relationship between the development of the insurance sector and economic growth in Tanzania. Specifically, they found that GDP per capita has a negative impact on insurance premium in Tanzania which contradicts the previous studies. In addition, they found that inflation and real interest rate affect Tanzania's insurance industry negative and significantly whereas the GDP growth rate is positive and significant in determining the growth of the insurance industry.

Trinh et al (2016) examined the Determinants of non-life insurance expenditure in both developed and developing countries in a panel data set covering 36 developed countries and 31 developing countries for the period 2000–2011. They find that economic freedom, income, bank development, urbanization, culture and law systems are the key drivers of the non-life insurance expenditure across countries even if their impacts differ significantly between the groups of developed and developing countries.

Buric et al (2017) analyzed the impact of GDP, unemployment rate, wages and the interest rate on total life premium in Western Balkans in the period 2005 to 2015 by using panel data analysis. Based on this the study finds that most of the above-mentioned economic factors have a significant impact on total life premium of countries of the Western Balkans. Specifically, it shows that GDP and wages have a significant and positive impact on demand for life insurance, while the impact of the unemployment rate and interest rate is negative. By using a balanced panel data model Meko et al (2019) also examined the determinants of life insurance demand in Ethiopia using the data collected from four insurance companies for sixteen years, from 2001-2016. The regression result of this study show that real interest rate, life expectancies, age dependency ratio, urbanization, and inflation has positive and significant effect at 1% and 5% significance level on life insurance demand in Ethiopia, whereas GDP per capita and price of insurance were found insignificant to affect life insurance demand in Ethiopia. Finally, they noted that in marketing their life insurance products concerned insurance companies should consider these factors into account.

2.3. Determinants of insurance business development

Based on the reviewed theoretical and empirical literature, in this section, the researcher is going to present the factors that have been found as a possible determinant of the demand for life and the non-life insurance business in previously conducted studies.

Economic factors

Income: Among all the factors of influence, income is essential in all the models of insurance demand. Higher income is expected to increase the demand for life insurance, generating greater affordability of life insurance products. According to Feyen et al (2011), one reason for this is the need to safeguard the potential income of children against the premature death of the employed parent. Referring to the life insurance line of business, income is found to have a significant positive impact on the insurance demand by all the researchers interested in the subject. The income level of a country is measured by the gross domestic product (GDP) per capita, and it positively influences life insurance consumption. In a cross-sectional study for 68 countries, and then in a panel study for the period 1961–1980, Beck and Webb (2003) explained that for higher incomes, the life insurance demand rises because of the human capital of an individual increase along with income. In addition, Beenstock et al (1988), Browne et al (2000) and Esho et al (2004) similarly discovered a positive relationship between income and consumption for property liability insurance. Treerattanapun (2011) considered that for higher levels of GDP/capita, non-life insurance becomes more affordable. As a result, the demand for insurance products rises. He also observed that different lines of non-life insurance products dominate in certain countries. Therefore, the consumption of insurance products may vary across the lines of business and across individuals; for example, motor insurance is dominant on the non-life insurance market, especially in emerging markets.

Economic growth*:* when an economy grows through producing more goods and services, consumers have more disposable income which to purchase assets. As they purchase more valuable assets, they are likely to consider the risk of damage and /or loss to those assets and therefore set aside more to secure their assets through insurance Chitiyo (2017). Outreville (1992) proposes that in principle and all other things being equal as the level of economic development of a country increases, the volume of business increases and the capacity of the insurance company to supply service also increases. In addition, Christophersen and Jakubik (2014) also suggest that there is a strong link between gross written premium and economic growth. Improved economic activity will raise the demand for non-life insurance, improve income and spending, which will increase investment appetite and create greater demand for protection and saving needs, which in turn will boost the sale of life insurance (UNCTAD, 2018).

Inflation Beck and Webb (2003), Li et.al (2007), Nesterova (2008), Amrot (2014) Çelik and Kayali (2009), Ibiwoye et.al (2010) have all shown that inflation reduces the demand for life insurance. Inflation and its volatility have a negative relationship with life insurance consumption. As life insurance savings products typically provide monetary benefits over the long term, monetary uncertainty has a substantial negative impact on these products expected returns. Inflation can also have a disruptive effect on the life insurance industry when interest rate cycles spur disintermediation. These dynamics make inflation an additional encumbrance to the product pricing decisions of life insurers, thus possibly reducing supply in times of high inflation. The above-stated articles have all shown that the use of life insurance is negatively related to inflation. Further, inflation has a similar negative impact on non-life insurance demand.

Interest rate: Beck and Webb (2003), Ayaliew (2013) Amrot (2014) suggested that life insurance demand is positively influenced by the real interest rate. In addition to the inflation rate and its standard deviation, the relationship between life insurance consumption and the real interest rate, defined as the difference between the nominal interest rate and inflation. Theory predicts a positive relation; a higher real interest rate increases life insurer‘s investment returns and so profitability, in turn offering improved profitability of financial relative to real investments for potential purchasers of life insurance policies. Whereas with respect to the non-life insurance, underwriting cycle theory suggests that when interest rates are high in the market place, insurance prices will be low. Suggesting that more consumers would be attracted to non-life insurance products as opposed to using debt to cover unexpected losses (Ma & Pope, 2003). Only one study has considered the impact of interest rates on non-life insurance demand in 1988; and found that indeed there was a positive effect on non-life (property liability) insurance demand (Beenstock et al 1988).

Financial or banking sector Development: As identified by Outreville (1996) and Beck and Webb (2003) life insurance demand is significantly influenced by the banking sector development. It is expected that the banking sector development to be positively correlated with life insurance consumption. Well-functioning banks may increase the confidence consumers have in other financial institutions, e.g. life insurers. They also provide life insurers with an efficient payment system. The efficient development of the entire financial system - as might be reflected in the absence of interest rate ceilings and other distortionary policies – is thought to help life insurers invest more efficiently. Outreville (1996) finds a significantly positive relationship between financial sector development and life insurance penetration.

Financial depth captures the size of the financial sector relative to the economy. It is the size of banks, non-banking financial institutions, and financial markets in a country, taken together and compared to a measure of economic output (World Bank, 2016). Early studies by Outreville (1992), included this factor in the determinants for non-life insurance demand, supposing that the growth of the financial services sectors would be a catalyst for insurance demand. However, they found this variable was insignificant in their models. Chitayo (2017) notes that government entities and/or parastatals may rely heavily on local treasury departments to cover their risks, and mostly private sector players recognize the immediate need to purchase non-life products. By stimulating debt capital to the private sector, lenders could impose insurance conditions creating the need to consider insurance when taking out debt capital. This could be partly explained by the increasing trend of credit insurance in banking and in the retail sector.

Market structure: Within developed and developing markets competitive market is a pushing factor for the insurance ownership as identified in the studies of Ma & Pope (2003), Treerattanapun (2011) Zhang & Zhu (2004) and Stojic and Njengomir (2012). The measurement variable used to test market concentration is the Herfindahl Index, which sums the market shares of the ten largest non-life and life insurers in the market and multiplies the result by 10,000. A monopolistic insurance market will have a score of 10,000, whilst more competitive markets exhibit scores below 1800. The verified relationship has been that a negative relationship exists between market concentration and insurance demand. The less competitive an insurance market is (i.e. higher Herfindahl Index Score), the less it attracts foreign insurers who can bring improves business processes and product innovation into the sector, therefore the less increase in non-life and life insurance demand we will experience. Conversely, the more competitive the sector is (i.e. lower Herfindahl Index Score), the more insurance demand should increase. An alternate measurement approach utilized by Ma & Pope (2003) within developed markets was to consider the density ratio of foreign premiums as an indicator for market competitiveness.

Trade openness: Petkovski and Jordan (2014) find that trade openness is significant, suggesting that more open countries accumulate more insurable assets. In addition, Newbery and Stiglitz (1984) suggest that trade openness contributes to the development of the financial sector by increasing the necessity of insurance and risk diversification through financial institutions due to increasing uncertainty, income volatility, foreign competition, and higher exposure to external shocks. Trade openness is measured by looking at the ratio of exports (and imports) to GDP Outreville (2013). The expectation is that more openness (i.e. higher ratio) would positively impact non-life insurance demand, as increased trade would require more companies to protect their goods and/or services against potential future losses or damage, increasing the need for non-life insurance products Chitayo (2017).

Price of Insurance: The relationship between the price of insurance and life insurance demand has been studied in the past by (Outreville, 1996, Ward and Zurbruegg, (2002), Hwang and Greenford, (2005); Sen and Madheswaran, (2007). However, the indicator of the price of life insurance is not available in the most of the studies because it is difficult to determine the price of insurance with the various customized nature of policies (Outreville, 1996; Savvides, 2006). The findings of these studies indicate that the price of insurance is positively related to life insurance demand (Mantis and Farmer, 1969; Ward and Zurbruegg, 2002); the price of the insurance variable is positive and statistically insignificant in the fixed effects model and is found negatively and statistically insignificant in the pooled cross-sectional model (Hwang and Greenford, 2005). This is because the longer life expectancy which is used to proxy the price of insurance has a positive effect on life insurance demand by resulting in a reduction in the price of insurance which leads the people to use life insurance (Outreville, 1996); the researcher suggested that the lower the price of insurance, it is expected to encourage more life insurance demand (Hwang and Greenford, 2005). Other empirical results showed that price of insurance is negatively related to life insurance demand (Outreville, 1990; Brown and Kim, 1993); whereas another study concluded that price situation does not affect life insurance demand at all (Sen and Madheswaran, 2007).

Savings: The impact of savings on life insurance demand has been studied in the past (Beck & Webb, 2003; Sen, 2008; Ibiwoye, Ideji, Oke, 2010). Evidence from the literature suggests that savings have a negative impact on life insurance demand (Beck & Webb, 2003; Savvides, 2006; Redzuan, Abdul Rahman & S. H. Aidid, 2009). Consumers prefer to consider other alternatives of saving if the effective return within an insurance policy is lower compared to those offered by other saving instruments (Redzuan, Abdul Rahman & S. H. Aidid, 2009); there is a wealth-replacement effect which means that higher private savings displace life insurance and the higher the savings that an individual has, the less would be the motive to buy life insurance to supplement these financial resources in order to reach a targeted level of wealth for retirement or for bequeaths (Savvides, 2006). Other results show that saving variable has a positive relationship with life insurance demand (Sen & Madheswaran, 2007; Sen, 2008) and suggested that an increase in saving activity will enhance life insurance demand by increasing per capita insurance expenditure. Another result provided an ambiguous priority in the effect of personal savings rate on life insurance sales because an individual may have other investment alternatives besides the demand for life insurance Chang (1995).

Unemployment: The Unemployment rate is defined as an indicator of income uncertainty and is also viewed as an uncertainty variable. A few studies have been carried out to explain the relationship between the demand for life insurance and the unemployment rate (Mantis & Farmer, 1968; Savvides, 2006). Results from the studies suggest that the unemployment rate has a negative impact on life insurance demand (Mantis &Farmer, 1968; Lenten & Rulli, 2006 and Savvides, 2006).

Unemployment rates, represent the ability individuals to access wages/salaries to cover their expenses. It is likely that a negative relationship between non-life insurance demand and inflation rates holds, as fewer people would not afford to take up value-added financial services products such as insurance. Evidence on the effect of unemployment on demand is limited and no prior research has tested the relationship of this variable on non-life insurance demand (Outreville F. J., 2013, p. 91). The study conducted by Chitiyo (2017) was the first research to test the impact of unemployment rates on non-life insurance demand and find that a highly significant negative relationship exists between the two variables. He suggests that higher unemployment rates result in fewer people affording value-added financial services products such as insurance. This barrier to affordability may be the real reason why despite higher incomes individuals may opt out of certain products or deem non-life products undesirable. Furthermore, because the primary mandatory products are typically offered together with a loan for an asset (eg. car or house) which requires full-time employment, temporary employees are limited from accessing these products.

Pensions: Pension is considered as a source of financing for retirement periods and is considered as an alternative to private provisions. The growth of pensions has contributed to the decline in labor force participation at older ages (Samwick, 1998). Having adequate old-age pensions helps to encourage workers to retire earlier (Savvides, 2006). The existence of both private pensions as well as social security appears to have a negative effect on individual savings (King &Mireaux, 1981).

Socio-demographic determinants

Level of Education: In the academic literature, the level of education in a country is used as a proxy for risk aversion, but there are differences in the results obtained for non-life and life insurance sectors. Concerning life insurance demand, Truett and Truett (1990) showed, in a time series study for the US and Mexico for the period 1960–1982, that a higher level of education represents a stronger desire to protect dependents. Browne and Kim (1993) also found, on a cross-sectional study for 45 countries, a significant positive influence of education over the demand for life insurance. The studies of Duker (1969), Anderson and Nevin (1975) and Auerbach and Kotlikoff (1989) revealed that education is negatively related to life insurance demand. Zietz (2003) discovered that published research shows conflicting results for certain determinants of life insurance demand, including education. Education is found insignificant for life insurance demand by a large part of the academic literature. Outreville (1996) emphasized, in a cross-sectional study for 48 developed countries, that individuals with a higher level of education are more aware of the risk and importance of risk management. Still, he could not prove the relationship with life insurance demand empirically. Li et al (2007) explained this ambiguity by the fact that if more people are involved in the educational process, there will be a smaller labor force, thus reducing the overall GDP of the country. In fact, by increasing the period of dependency, education appears not to have any robust influence on life insurance consumption (Beck and Webb, 2003). Feyen et al (2011) discovered that schooling does not seem to be an important driver of life insurance. Individuals with higher education generally have higher incomes and tend to purchase life insurance. Still, the result must be interpreted with care, due to the strong correlation between schooling and GDP per capita. Hau (2000) analyzed 3,143 households from the US Survey of Consumer Finances (SCF) and stated that it is unclear if education affects life insurance. Treerattanapun (2011) suggested that tertiary education is not a good proxy for the capacity of a person to understand the complexity of insurance products because the knowledge of these products may not be taught in schools. Ofoghi and Farsangi (2013) suggested that the level of risk aversion for individuals with insurance knowledge is higher than the level for those without insurance knowledge. Liebenberg et al (2012) concluded that, although the results on the effect of education are mixed, many studies indicate that professional, self-employed and managerial people have relatively more life insurance holdings.

Curak, Dzaja, and Pepur (2013) suggested that education increases risk aversion and encourages people to demand life insurance. For the non-life insurance sector, the opinions converge towards the idea that education positively influences the demand for such products. Treerattanapun (2011) indicated that education increases the awareness of risk and threats to financial stability, facilitating the understanding of insurance benefits. Park and Lemaire (2011) also found a positive relationship between education and non-life insurance demand, considering 82 countries for a period of 10 years. Ofoghi and Farsangi (2013) proved a significant and positive relationship between risk aversion and auto insurance demand, in which individuals with insurance knowledge are more risk-averse.

Life Expectancies: Most researchers expect life expectancy to have a negative impact on the demand for life insurance, on the grounds that a longer life expectancy is associated with a lower probability of premature death and lower need for life insurance. However, Beck and Webb (2003) show that the effect of life expectancy on life insurance demand is ambiguous, considering the other business lines provided by insurers (savings for retirement, annuities). Therefore, it is not surprising to find very mixed results in the empirical literature. Browne and Kim (1993) and Beck and Webb (2003) do not find significant effects, Outreville (1996) find a positive and significant coefficient, but Li et al (2007) find exactly the opposite result.

Dependency Ratio: The dependency ratio is described as the demographic structure of the average household in terms of the number of family members dependent on the main source of income (Lenten & Rulli, 2006). Empirical studies have shown that the dependency ratio is positively related to the demand for life insurance (Brown & Kim, 1993; Curak & Gaspic, 2011); and it has been found that the dependency ratio has a positive impact on foreign life insurance participation (Ye, Li, Chen & Moshirian, 2009). The increasing number of dependents shows that the person needs to buy more life insurance. In line with this, findings of past studies have indicated that young dependency ratio is negatively related to life insurance demand (Beck & Webb, 2003; Sen & Madheswaran, 2007). It is expected that a young dependency ratio will increase the demand for mortality coverage and decrease the demand for savings through life insurance and annuities (Beck & Webb, 2003). Whereas, an old dependency ratio is found to be positively related to the demand for life insurance (Beck & Webb, 2003; Sen, 2008). This can be explained as the older population grows, there will be a higher demand for savings (Nesterova 2008; Beck & Webb, 2003).

Age: (Truet & Truet, 1990; Yusof, Gbadamosi & Hamadu, 2009; Liebenberg, Carson & Hoyt, 2010) identified that age is positively related to life insurance demand. This is because an increase in age indicates a higher positive attitude toward insurance and people who are towards the end of an active life are more conscious of life after retirement (Yusof, Gbadamosi & Hamadu, 2009). But, it was disclosed that when people grow up they have a greater awareness of the need for life insurance but the need for life insurance will decline as the people reach beyond a certain age. Evidence supports that age was found to have a negative impact on life insurance demand (Goldsmith, 1983; Chen, Wong & Lee, 2001; Savvides, 2006; Liebenberg, James & Randy, 2010). This can perhaps be explained as people are more likely to purchase life insurance for morbidity (illness) as well as for retirement purposes which vary with their affordability and not age (Chen, Wong & Lee, 2001); as the average age of people increased the cost of obtaining coverage also increased and this can reduce the desirability of purchasing life insurance (Goldsmith, 1983); and for older people they are less likely to become involved in long-range planning (Savvides, 2006).

Urbanization: Another important factor for the development of the insurance industry in emerging countries is urbanization (Kalra, Fan, and Sinha, 2013). For the life insurance sector, the study of Hwang and Gao (2003) analyzing the impact of urbanization, found a positive relationship that was explained through the propensity of saving funds for the retirement of the urban population. Sen and Madheswaran (2007) and Sen (2008) discovered, for 13 Asian economies, among which were India and China, a positive relationship between urbanization and the demand for such products. Nesterova (2008), on a study of Central and East European (CEE) countries and some selected countries from the former Soviet Union, found that urbanization level is not significant for life insurance demand. The findings of Beck and Webb (2003) do not statistically confirm the positive impact of urbanization on life insurance demand, even if the concentrations of consumers in a geographical area reduce the costs of marketing, underwriting, and claims handling.

For the non-life insurance sector, Sherden (1984) stated that urban inhabitants perceive a higher risk of car accidents and thefts. Browne, Chung, and Frees (2000) discovered that the rate of interaction between individuals increases in urban areas, and they used urbanization as a proxy for loss probability: if the probability of loss increases, the insurance demand increases too. Esho et al (2004) considered that additional sources of security are needed, as consequences of increasing delinquency are caused by the greater concentration of assets in an urban area. Hwang and Gao (2003) concluded that urbanization determines smaller families with no economic security, which makes insurance an efficient tool for providing financial security. Park and Lemaire (2011) also found a positive relationship between urbanization and non-life insurance demand, while Treerattanapun (2011) discovered the insignificance of urbanization for the non-life sector.

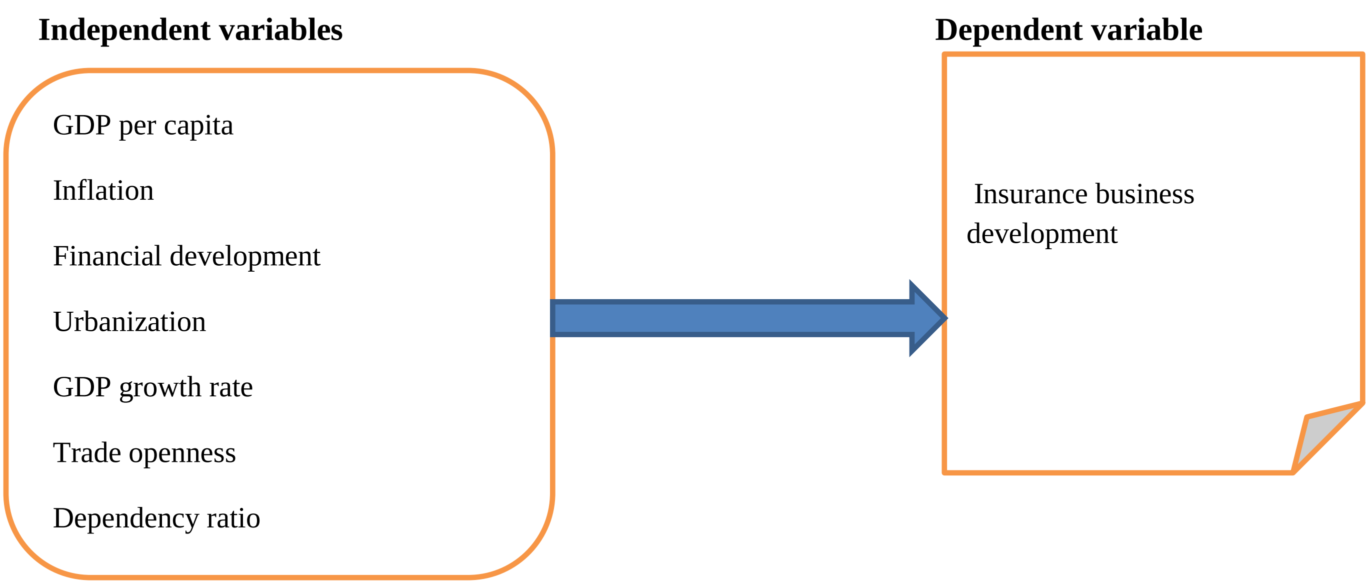
2.4. Conclusion and Knowledge gap

From the above-reviewed literature's it is possible to conclude that while prior studies have examined insurance demand in both developed and emerging markets none has exclusively explained the drivers of insurance consumption in Ethiopia. This motivates the researcher to investigate the factors that significantly determine insurance demand (both life and non-life insurance) in Ethiopia by examining some economic and demographic variables against the insurance premium of the industry (insurance premium of both life and non-life insurance). In line with this, up to the researcher's knowledge, there are some studies in Ethiopia examined factors that determine insurance demand particularly life insurance consumption. For instance, researchers such as Amrot (2014), Ayaliew (2013), Sulaiman, et al (2015) studied the factors that determine life insurance demand in Ethiopia. However, no one of these and other previous studies has examined the non-life insurance demand in Ethiopia. Based on this, this study examines the factors that significantly determine the demand for life and non-life insurance in Ethiopia. Further, this study fills the existing literature gap; first, by investigating the demand leading external factors that have a potential effect on demand for insurance by analyzing the level of effect the explanatory variables have on the life and non-life insurance business that was not done by previous researchers in Ethiopia. Second, by extending the period of investigation and by introducing some additional new variables as explanatory variables that were not examined in previous researches conducted in Ethiopia.

2.5. Conceptual framework

After the careful study of the literature review, a conceptual model is formulated to illustrate the potential determinants of insurance business development in Ethiopia. The model shows GDP per capita, GDP growth, inflation, trade openness, financial development, dependency ratio and urbanization as independent variables and insurance business development (both life and non-life insurance business) as the dependent variable.

Figure 2. 1 Conceptual framework



Source: based on the review of previous theoretical and empirical literature's

Chapter three

Research methodology

This chapter highlights the methodology of the research, research design, type and sources of data, model specification, definition and description of variables as well as techniques of data analysis.

3.1. Research design and approach

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement, and analysis of data (Kothari, 2004). The research design also reflects the purpose of the inquiry. Because the objective of our study is examining those potential drivers of insurance business development in Ethiopia measured by gross insurance premium, the study adopted an explanatory research design as such research design aims in identifying any causal links between the factors or variables that pertain to the research problem with a quantitative research approach which is based on the quantitative data of variables.

3.1.1. Nature and source of data

Based on the objective of the study the researcher used 38 years' time series data which covers the period 1980 to 2017 with an annual periodicity. The study used secondary data that was obtained from the National Bank of Ethiopia, World Bank (World Development Indicators), Ethiopian insurance corporation (EIC).

3.1.2. Definition and description of variables

Here two types of variable are considered, namely the dependent variable and independent variable. These are explained as follows:

Dependent variable

Gross written premium: In this study, the dependent variable is insurance business development which is measured by the gross insurance premium. Gross written premium is the most usual and simplest indicator of insurance industry development and it can be defined as the total premium written and assumed by an insurer before deductions for reinsurance and ceding commissions and are the principal source of an insurance company's revenues. Previous researchers such as Zhang and Zhu (2004), Cepelakova (2015) and Christophersen & Jakubik (2014) used gross insurance premium in their study as a measure of the country's insurance sector development.

Independent variables

The independent variables of the study are GDP per capita, economic growth, inflation, financial development, trade openness, dependency ratio, and urbanization. These variables are identified based on the review of previous literature and which are found as an important determinant of insurance sector development of countries in most of the previous studies. Below the researcher presents the definition and measurement of each of the explanatory variable of the study.

A. **GDP per capita:** measures the average income earned per person in a given area (city, region, country, etc.) in a specified year. In this study consistent with previous studies this variable is measured by dividing the annual gross domestic product to the total population of the year and is used to measure the citizen average annual per capita income**.**

B. **Economic growth:** Economic growth indicates an increase in the production of goods and services over a specific period. To be most accurate, the measurement must remove the effects of inflation. This study used the percentage change in annual real GDP as a measure of economic growth which is the increase in the inflation-adjusted market value of the goods and services produced over time.

C. **Financial Development**: may be defined as the developments in the size, efficiency and stability and access to the financial system. The Financial sector is the set of institutions, instruments, and markets. It also includes the legal and regulatory framework that permit transactions to be made through the extension of credit. As a measure of the level of financial sector development, this study has used the ratio of the broad definition of money (M2) to GDP. According to (Chitiyo, 2017), the Broad definition of money (M2) is often taken as an adequate measure of the financial sector in developing countries in view of the predominance of the banking sector as well as to the lack of data on other financial assets.

D. Inflation: Inflation is the rate of increase in prices over a given period of time. Inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country. But it can also be more narrowly calculated—for certain goods, such as food, or for services, such as a haircut, for example. Whatever the context, inflation represents how much more expensive the relevant set of goods and/or services has become over a certain period, most commonly a year. In this study, the researcher used the most widely used measure of inflation that is the percentage change annual consumer price index as a measure of inflation.

E. Trade openness: shows inward and outward movement of goods through a country or territory including movements through customs warehouses and free zones. Goods include all merchandise that either adds to or subtracts from the stock of material resources of a country or territory by entering (imports) or leaving (exports) the country's economic territory. Accordingly, this study has used the sum of import and export to GDP as a proxy to trade openness.

F. Dependency ratio: The dependency ratio is the number of dependents in a population divided by the number of working age people. Dependents are defined as that aged 0- 14 and those aged 65 and older. Working age is from 15 to 64. The ratio describes how much pressure an economy faces in supporting its non-productive population. The higher the ratio, the greater the burden carried by working-age people. Here in this study, the researcher is used the total number of dependents (those population less than the age of 15years and above the age of 65 years) divided by the working population (those age of between 15 and 65 years) as measure dependency ratio.

G. Urbanization: can be defined as the population shift from rural areas to urban areas, the gradual increase in the proportion of people living in urban areas, and the ways in which each society adapts to this change. The study is used the percentage change in annual urban growth as a proxy to urbanization i.e. the increase in the proportion of the urban population over time, calculated as the ratio of urban population to that of the total population.

Table 3. 1 Variables and their measurement

Variable	Notation	Measurement
GDP per capita	I	Gross domestic product divided by the total population of the year
Economic growth	GDP	percentage change in annual real GDP
Inflation	CPI	percentage change in annual consumer price index
Financial Development	FID	Broad money (M2) divided by GDP
Trade openness	TO	The sum of import-export divided by GDP
Dependency Ratio	DR	the sum of population age of under 15 and age above 65 divided to the working population age between 15 and 65
Urbanization	URB	percentage change in annual urban growth

3.1.3. Methods of data analysis

Descriptive as well as Econometric methods are employed to discuss and analyze the different aspect of the study. Descriptive analysis is employed by using different tables and figures. An econometric analysis were used to examine the determinants of insurance business development based on annual time series data 38 years from 1980-2017; for this purpose Eviews10 software was used. To test whether a series is stationary or not Unit root tests is used and Using Eview10 the feasibility of the study model was tested by applying different model diagnostic tests as welas summary of descriptive statistics for the variables of the study and also the model stability testing techniques were presented. Finally, a detailed discussion of the short run and long run regression result of the study were made.

3.1.4. Model specification/ Estimation

To estimate the short run and long-run effect of the explanatory variables on insurance business development study adopted Autoregressive distributed lag (ARDL) estimation technique. ARDL is preferable when dealing with variables that are integrated of a different order, I(0), I(1) or combination of the both and, robust when there is a single long-run relationship between the underlying variables in a small sample size. To overcome the shortcomings of Johansen co-integration this study adopted the bounds testing approach to co-integration to estimate the long-run relationships among the dependent and the independent variable of the study. Pesaran and Shin (1997, 1999) and Pesaran et al. (2001), proposed an Autoregressive Distributed Lag

(ARDL) bounds testing approach to investigating the existence of co-integration relationship among variables. This approach has specific advantages over Johansen maximum Likelihood (1988) co-integration approaches: First it avoids the problem of the order of integration associated irrespective of I(0) or I(1). Second, unlike Johansen co-integration which is valid for large sample size, it is suitable for small sample size study (Pesaran et al, 2001). Third, it provides unbiased estimates of the long-run model and valid t-statistics even when some of the regressors are endogenous (Harris and Sollis, 2003).

To capture the relationship between economic and demographic variables (i.e. GDP per capita, economic growth, inflation, financial development, trade openness, urbanization, and dependency ratio) and insurance business development which is measured by insurance premium the study specified the following functional relationship:

Insurance premium= f (income, economic growth, inflation, financial development, trade openness, dependency ratio, urbanization) ……………………………………equation (1)

Since the explanatory variables of the study may have different level of significance and implication with respect to life and non-life insurance the researcher tries to estimate their effect on the dependent variable using two separate models for each line of the insurance business (i.e. life and non-life insurance model). The following functional form $(equation\ 2\ and\ equation\ 3)$ shows the log-linear relationship of the dependent and the independent variables of the study;

$$lnLP = \beta 0 + \beta 1I + \beta 2GDP + \beta 3FID + \beta 4CPI + \beta 5TO + \beta 6URB + \beta 7DR + \varepsilon t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots\, equation\ (2)$$

$$lnNLP = \beta 0 + \beta 1I + \beta 2GDP + \beta 3FID + \beta 4CPI + \beta 5TO + \beta 6URB + \beta 7DR + \varepsilon t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots .\, equation\ (3)$$

Where

$lnLP = \log of\ life\ insurance\ premium,\ lnNLP = \log of\ \ non - life\ insurance\ premium$, $\varepsilon t =\ error\ term.$

Further, below ($equation\, 4$) the researcher specified the mode that was used toestimate the short run and long-run effect of the explanatory variable on the dependent variable. Based on this the generalized ARDL (p, q) model is specified as follows;

$$Yt = \gamma oi + \sum_{i=1}^{p} \alpha iyt - 1 + \sum_{i=1}^{q} \beta jxt - 1 + \varepsilon it \dots \dots \dots equation(4)$$

Where, $\gamma, is\ the\ intercept\ \alpha, \beta\ \ and\ \varepsilon t\ are$, coefficient of co-integrated variables, and a vector of the error term and $yt \& xt$ are co-integrated stationary variables. Whereas $p\ and\ q\ are\ the\ optimal\ lag\ order$ of the $dependent\ and\ independent\ variables$ respectively. Equation (4) is said autoregressive since it includes lags of the p dependent variable and is said distributed lag model because it includes q lags of the explanatory variable.

The following ARDL model is estimated in order to test long run relationship or to test co-integration among the variables of the study:

$$\Delta lnlife = \alpha 0 + \alpha 11 lnlife\, t - 1 + \alpha 12 lnlife\, t - 2 + \alpha 21 lnI\, t - 1 + \alpha 22 lnI\, t - 2 + \alpha 31 GDPt - 1 + \alpha 32 GDPt - 2 + \alpha 41 FID\, t - 1 + 42 FID\, t - 2 + \alpha 51 CPI\, t - 1 + \alpha 52 CPI\, t - 2 + \alpha 61 URB\, t - 1 + \alpha 62 URB\, t - 2 + \alpha 7\, 1DR\, t - 1 + \alpha 7\, 2DR\, t - 2 + \alpha 81\, TO\, t - 1 + \alpha 82\, TO\, t - 2\ \sum_{i=1}^{p} \beta 1\, \Delta lnlife\, t - 1 + \sum_{i=1}^{q} \beta 2\, \Delta I\, t - 1 + \sum_{i=1}^{q} \beta 3 \Delta GDP\ \ t - 1 + \sum_{i=1}^{q} \beta 4 \Delta FID\, t - 1 + \sum_{i=1}^{q} \beta 5 \Delta CPI\, t - 1 + \sum_{i=1}^{q} \beta 6 \Delta URB\, t - 1 + \sum_{i=1}^{q} \beta 7 \Delta DR\, t - 1 + \sum_{i=1}^{q} \beta 8 \Delta TO\, t - 1 + \varepsilon t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (5)$$

$$\Delta lnnon - life = \alpha 0 + \alpha 11 lnnon - life\, t - 1 + \alpha 12 lnlife\, t - 2 + \alpha 21 lnI\, t - 1 + \alpha 22 lnI\, t - 2 + \alpha 31 GDPt - 1 + \alpha 32 GDPt - 2 + \alpha 41 FID\, t - 1 + 42 FID\, t - 2 + \alpha 51 CPI\, t - 1 + \alpha 52 CPI\, t - 2 + \alpha 61 URB\, t - 1 + \alpha 62 URB\, t - 2 + \alpha 7\, 1DR\, t - 1 + \alpha 7\, 2DR\, t - 2 + \alpha 81\, TO\, t - 1 + \alpha 82\, TO\, t - 2 \qquad \sum_{i=1}^{p} \beta 1\, \Delta lnnon - life\, t - 1 + \sum_{i=1}^{q} \beta 2\, \Delta I\, t - 1 + \sum_{i=1}^{q} \beta 3 \Delta GDP\ \ t - 1 + \sum_{i=1}^{q} \beta 4 \Delta FID\, t - 1 + \sum_{i=1}^{q} \beta 5 \Delta CPI\, t - 1 + \sum_{i=1}^{q} \beta 6 \Delta URB\, t - 1 + \sum_{i=1}^{q} \beta 7 \Delta DR\, t - 1 + \sum_{i=1}^{q} \beta 8 \Delta TO\, t - 1 + \varepsilon t \dots \dots \dots \dots \dots .. (6)$$

Where

$\alpha 0, \alpha i, \beta i, and\ \varepsilon t\ are\ intercept, long\ run, short\ run\ coefficients\ and\ white\ noiseerrors, respectively$. Moreover, p & q denotes the optimal lag order of the dependent and independent variables.

The first step in the ARDL bounds testing approach is to estimate $equation$ (5) and (6) in order to test for the existence of a long run relationship among the variables by conducting $F - test$ for the joint significance of the coefficients of the lagged levels of the variables. Based on this, the two asymptotic critical value bounds provide a test for co-integration when the independent variables are the order of I(0) or I(1) a lower value assuming the regressors are I(0) and an upper value assuming are regressors purely I(1). If the t-statistic is above the upper critical value, the null hypothesis of no long-run relationship can be rejected irrespective of the orders of integration for the time series and vice versa. Then, once co-integration is established the conditional ARDL($p, q1, q2, q3, q4, q5, q6, q7$) long run model will be estimated as follow:

$$\Delta lnlife\ t = \sum_{i=1}^{p} \beta 1\ \Delta lnlife\ t-1 + \sum_{i=1}^{q} \beta 2\ \Delta It-1 + \sum_{i=1}^{q} \beta 3 \Delta GDP\ \ t-1 + \sum_{i=1}^{q} \beta 4 \Delta FID\ t-1 + \sum_{i=1}^{q} \beta 5 \Delta CPI\ t-1 + \sum_{i=1}^{q} \beta 6 \Delta URB\ t-1 + \sum_{i=1}^{q} \beta 7 \Delta DR\ t-1 + \sum_{i=1}^{q} \beta 8\ TO\ t-1 + \boldsymbol{\gamma ECT\ t-1} + \varepsilon\ t-1 \ldots (7)$$

$$\Delta lnnon-life\ t = \sum_{i=1}^{p} \beta 1\ \Delta lnnon-life\ t-1 + \sum_{i=1}^{q} \beta 2\ \Delta I\ t-1 + \sum_{i=1}^{q} \beta 3 \Delta GDP\ \ t-1 + \sum_{i=1}^{q} \beta 4 \Delta FID\ t-1 + \sum_{i=1}^{q} \beta 5 \Delta CPI\ t-1 + \sum_{i=1}^{q} \beta 6 \Delta URB\ t-1 + \sum_{i=1}^{q} \beta 7 \Delta DR\ t-1 + \sum_{i=1}^{q} \beta 8\ TO\ t-1 + \boldsymbol{\gamma ECT\ t-1} + \varepsilon\ t-1 .. (8)$$

Where, $\beta 1, \beta 2, \beta 3, \beta 4, \beta 5, \beta 6, \beta 7$ are the short run dynamics coefficients of the model, γ represents the parameter of the speed of adjustment that measures the speed of adjustment towards the long-run equilibrium and should have a negative $sign$ and ECT is the error correction term which captures the long run relationship in the model and finally $\varepsilon t\ is\ vector\ of\ white\ noise\ error\ terms.$

Chapter four
Data analysis and interpretation

Introduction

The previous chapters presented the introduction of the study, the literature review and the research methodology adopted in the study; this chapter deals with results and discussions. The chapter has presented descriptive statistics of the variables of the study based on their original data. Further, before estimating, the researcher performs different data and model validity testing techniques. These were data stationarity test, co-integration test, model validity test (i.e. Normality, Heteroskedasticity, and Autocorrelation) and model stability testing tests were used. Finally, this section presents the long run and short run regression results and discussions.

4.1. Descriptive statistics

The following table 4.1. Shows the summary of the descriptive statistics of the dependent and the independent variables of the study based on their original data set. The table reports each variable mean value, the maximum and minimum value, standard deviation, and the number of observations of the dependent variable (i.e. the gross insurance premium) and the independent variables (i.e. I, GDP, CPI, FID, DR, TO and URB) based on 38 years of observation.

Table 4. 1 Descriptive statistics summary

	LP	NLP	I	GDP	FID	DR	CPI	TO	URB
Mean	59744777	1.35E+09	2704.754	5.625035	27.90717	91.49368	8.829702	24.035	4.729836
Median	11395636	3.72E+08	848.0889	7.9	28.39655	94.09703	7.097201	23.59393	4.810485
Maximum	3.00E+08	9.00E+09	15976.46	13.9	39.27283	99.13093	55.24131	40.90269	5.517562
Minimum	3210000	90212000	324.26	-11.1	14.00029	75	-11.8232	4.909436	3.832442
Std. Dev.	88226660	2.19E+09	4098.609	6.560305	6.53464	8.097165	13.4952	9.890681	0.503673
Observati	38	38	38	38	38	38	38	38	38

Source: survey data 2017

In this study, the dependent variable is the gross insurance premium. The above descriptive statistics summary shows that the mean value of life insurance premium is Br.59, 744,777. This means that in the last 38 years the life insurance business generates an average amount of Br.59, 744,777 annual insurance premiums. Whereas the maximum amount of insurance premium generated by this line of insurance business was Br.300 million and the minimum amount was Br.3, 210,000. The standard deviation shows Br. 88,226,660 suggesting that life insurance premium amount was dispersed from the mean value. In addition, in the last 38 years, the non-life insurance business generated an average amount of Br.1,350,000 insurance premiums whereas the maximum and minimum premium amount of this line of insurance business was Br.9 billion and Br. 90,212,000, respectively. The deviation of the non-life insurance premium from its average value shows Br. 219,000,000 which indicates a high standard deviation.

GDP per capita is used in this study as a proxy for income that represents disposable personal income. The above descriptive statistics indicate that the last 38 years the annual average disposable income of citizens was Br2, 705 and the maximum and minimum amount of per capita income was Br.15, 976 and Br. 324, respectively. The standard deviation of GDP per capita was 4,100 suggesting that the value of the per capita income was not highly dispersed or far from its mean value. Further, our study measures the development of the financial sector as the ratio of the broad money (M2) to nominal annual gross domestic product. In Ethiopia in the last 38 years, the financial sector accounted on average about 27.90 of gross domestic product. The maximum and minimum percentage of contribution of the sector to the gross domestic product of the country was 39.27 and 14 percent, respectively. Whereas its deviation from the mean shows 6.53 percent, suggesting its high dispersion of the variable FID from the mean.

GDP growth rate measures the percentage change in the annual gross domestic product of a country in our case Ethiopia's economic growth rate. The above descriptive statistics which shows that in the last 38 years the average growth rate of Ethiopian economy was 5.62%. Moreover, in the last 38 years, the Ethiopian economy records a maximum growth rate of 13.90% and a minimum of (-11.10%). The standard deviation of GDP growth rate shows 6.56 percent, suggesting that GDP growth rate was not highly dispersed or far from the average value. Whereas inflation is measured by the annual percentage change in the consumer price index. The above descriptive statistics show that the average inflation rate for the years understudied was 8.82 percent, during those years the maximum rate of inflation was recorded as 55.24% and the minimum inflation rate was negative 11.82 percent. The standard deviation of CPI was 13.49% percent, suggesting that CPI was not highly dispersed or far from its mean value.

In this study, the variable trade openness (TO) be used to measure the level of the economic openness to international trade activity (i.e. import& export activity) and is computed by dividing the sum of import-export to the country's nominal gross domestic product. The above descriptive statistics table shows the country's average level of import and export in the last 38 years was 24.03% of the GDP. The maximum and minimum level of import and export trade as a ratio of GDP was 40.90% and 4.90%, respectively. The standard deviation of this variable was 9.89%, suggesting that trade openness was highly dispersed or far from its average value. Additionally, Dependency ratio indicates the number of dependents (those below age 15 and above the age of 65) as a fraction of the working age population (those population between the age of 15 and 65). The above statistics indicate that the average dependency ratio is 91.49%. The maximum level of dependency ratio was 99.13 percent out of the working population whereas the minimum dependency ratio was recorded as 75 for the last 38 years. The standard deviation of the dependency ratio in the period investigated was 8.10%, which shows high dispersion from the mean value. Finally, in our study, we use the annual urban growth rate as a measure of the level of urbanization. In the last 38 years, Ethiopia's average urban growth was 4.72%. The maximum of urban growth was 5.51% and the minimum growth was 3.83%. The standard deviation of this variable shows 0.50% shows its high dispersion from its average value.

4.2. Unit root test

Unit root tests are used to test whether a series is stationary or not. If a series is not stationary, it is said to have a unit root. For a series to be stationary, its mean and variance have to be constant over time. According to Gujarati (2004), a study on the stationarity of variables is relevant for the reason that it incorporates important behavior for these variables. A time series is required to be stationarity to make easier the study of the behavior of variables in the long run. If a time series is nonstationary, the behavior of the series can be studied only for the time period under consideration. Each set of time series data will, therefore, be for a particular period. As a consequence, it is not possible to generalize it to other time periods. Therefore, for the purpose of forecasting, nonstationary time series are of little practical value. These call for the need to test for stationarity of the series prior to a detailed analysis of the variables.

In order to examine the presence of unit roots in the time series data Augmented Dickey-Fuller (ADF) and Phillips and Perron (PP) tests are applied to all variables in levels and Except the variables GDP growth and CPI are stationary at order I (0) (see Appendix) all the remaining variables including the dependent variable are found non-stationary, then by the same way tests have been applied to first difference at trend and intercept in to order to make the remaining variables stationary and formally establish their order of integration. The null hypothesis is:

H0: Series contains a unit root

H1: series is stationary

The null hypothesis is rejected in favor of the stationary alternative in each case if the t- statistics is more negative than the critical values. The study used the p-value comparing with 5% critical values for unit root decisions. The value of the test statistics and the critical values given the type of test equations at intercept and trend and intercept at the level and at 1st difference are annexed with this study. While the results of tests of unit root for all variables at the first difference is processed and presented in Table 4.2.& Table 4.3 below.

(a) Unit root estimation by ADF tests

All variables are tested by ADF at level show non-stationary except the variables GDP growth and CPI which achieves their stationarity at the level. The remaining variables (i.e. Life, Non-Life, GDP per capita, FID, DR, TO and URB) absolute value of ADF t-statistic tests of unit roots is less than the absolute value of the 1%, 5% and 10% critical values. This implies a rejection of hypothesis series are stationary. In other words, the null hypothesis of having unit root fails to reject at the level and we would be differenced at order one or I(1) at the trend and intercept to make them stationary.

Decision rule

If t*(critical value) > ADF t-statistic, ==> not reject the null hypothesis, i.e., unit root exists

If t*(critical value) < ADF t-statistic, ==> reject null hypothesis, i.e., unit root does not exist

Table 4. 2 Unit root estimation by ADF test (at 1st difference) with trend and intercept

Series	ADF t statistics	5% critical value	10% critical value	Prob.	Order	Remark
LP	-4.966474	-3.540328	-3.202445	0.0015	I(1)	stationary
NLP	-6.843694	-3.540328	-3.202445	0.0000	I(1)	stationary
I	-4.591006	-3.540328	-3.202445	0.0041	I(1)	stationary
GDP	-9.242893	-3.544284	-3.204699	0.0000	I(0)	stationary
FID	-5.024746	-3.540328	-3.202445	0.0013	I(1)	stationary
DR	-5.915008	-3.540328	-3.202445	0.0001	I(1)	stationary
CPI	-8.292215	-3.544284	-3.204699	0.0000	I(0)	stationary
TO	-7.559978	-3.540328	-3.202445	0.0000	I(1)	stationary
URB	-4.243483	-3.540328	-3.202445	0.0098	I(1)	stationary

Source: survey data 2017

The results on the first difference at trend and intercept by ADF test are shown in the above table 4.2. The absolute value of ADF test statistic for Life, Non-Life, GDP per capita, FID, DR, TO and URB are greater than the critical value at 5% and 10% with the trend and intercept. This indicates that the null hypothesis is rejected at first difference for these variables, this means that the variables are stationary at order one I (1) except GDP growth and CPI which are stationary at the order I (0). Moreover, the results of the P-value of the variables are less than 5% shows that statistical significant to reject the null hypothesis or the non-stationary.

(b) Unit root estimation by Phillips-Perron (PP) test

This test has developed a more comprehensive theory of unit root non-stationary. This test is similar to ADF tests, but it is incorporating an automatic correction to the ADF procedures to allow for autocorrelated residuals. To make more confidence in the existence of stationary and to correct autocorrelation and heteroskedasticity problems Phillips-Perron test has been applied. The PP test results are presented as in Table 4.3 Below.

Table 4. 3 Unit root estimation by Phillips-Perron test (at 1st difference) with trend and intercept

Series	PPt statistics	5% critical value	10% critical value	Prob.	Order	Remark
LP	-4.95487	-3.540328	-3.202445	0.0016	I(1)	stationary
NLP	-6.813057	-3.540328	-3.202445	0.0000	I(1)	stationary
I	-4.709901	-3.540328	-3.202445	0.0003	I(1)	stationary
GDP	-15.09145	-3.540328	-3.202445	0.0000	I(0)	stationary
FID	-5.031924	-3.540328	-3.202445	0.0013	I(1)	stationary
DR	-5.915817	-3.540328	-3.202445	0.0001	I(1)	stationary
CPI	-24.54393	-3.540328	-3.202445	0.0000	I(0)	stationary
TO	-7.514794	-3.540328	-3.202445	0.0000	I(1)	stationary
URB	-4.243483	-3.540328	-3.202445	0.0098	I(1)	stationary

Source: survey data 2017

As can be seen from table 4.3, the absolute values of all variables are greater than 5% and 10% critical values and the P-values of all variables are less than 5%. This shows that the null hypothesis is rejected, this means the variable of the studies are stationary and statistically significant at the level and at first difference. It is, therefore, worth to conclude that all the variables are stationary and are integrated of order I(0) and I(1).

4.3. Long run ARDL Bounds Tests For Co-integration

The distribution of this F-statistics is non-standard, irrespective of whether the variables in the system are I(0) or I(1). The critical values of the F-statistics for a different number of variables (K), and whether the ARDL model contains an intercept and/or trend are available in Pesaran and Pesaran (1996a), and Pesaran et al. (2001). They give two sets of critical values. One set assuming that all the variables are I(0) (i.e. lower critical bound which assumes all the variables are I(0), meaning that there is no co-integration among the underlying variables) and another assuming that all the variables in the ARDL model are I(1) (i.e. upper critical bound which assumes all the variables are I(1), meaning that there is co-integration among the underlying variables). For each application, there is a band covering all the possible classifications of the variables into I(0) and I(1).

The first step in bounds test approach for co-integration is estimating the ARDL model specified in equation 5 and 6 in the previous section. Accordingly, the calculated F-statistic is 5.073802 and 7.042933 for life and non-life insurance model is higher than the upper bound critical value 3.21and 3.9 at 1and 5 percent significant level respectively in the life model and 3.21 and 3.9 at 1and 5 percent significant level respectively in the non-life model. Thus, the null hypothesis of no long-run relationships exist is rejected, implying there is long run co-integration relationships among the variable of the study.

The decision rule

If F-statistic> the I (0) and I (1) critical value =>> reject the null hypothesis

If F-statistic< the I (0) and I (1) critical value =>> fail to reject the null hypothesi

Table 4. 4 Life insurance model Bound test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.073802	10%	1.92	2.89
K	7	5%	2.17	3.21
		2.5%	2.43	3.51
		1%	2.73	3.9

Source: survey data 2017

Table 4. 5 Non-life insurance model Bound test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	7.042933	10%	1.92	2.89
K	7	5%	2.17	3.21
		2.5%	2.43	3.51
		1%	2.73	3.9

Source: survey data 2017

4.4. Lag selection criteria

If a long run relationship exists between the underlying variables, while the hypothesis of no long-run relations between the variables in the other equations cannot be rejected, then the ARDL approach to co-integration can be applied. The issue of finding the appropriate lag length for each of the underlying variables in the ARDL model is very important because we want to have Gaussian error terms (i.e. standard normal error terms that do not suffer from non-normality, autocorrelation, heteroskedasticity, etc.). In order to select the appropriate model of the long run underlying equation, it is necessary to determine the optimum lag length(k) by using proper model order selection criteria such as; the Akaike Information Criterion(AIC), Schwarz Bayesian Criterion (SBC) or Hannan-Quinn Criterion(HQC). This study adopted the Akaike Information Criterion (AIC) technique to select the optimal lag length of the variables and found optimal lag of 2 in both the life and non-life model as shown in table 4.6 and table 4.7 below and based on this the researcher applies lag of two throughout the study for estimation.

Table 4. 6 Non-Life insurance model lag selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-577.4843	NA	18471.86	32.52691	32.87880	32.64973
1	-320.7045	385.1697*	0.449557	21.81692	24.98396*	22.92230*
2	-241.6707	83.42458	0.342994*	**20.98171***	26.96389	23.06965

Source: survey data, 2017

Table 4. 7 Life insurance model lag selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-597.7942	NA	57087.11	33.65524	34.00713	33.77806
1	-319.1262	418.0021	0.411816	21.72923	24.89627*	22.83461*
2	-239.5784	83.96706*	0.305355*	**20.86547***	26.84765	22.95341

Source: survey data, 2017

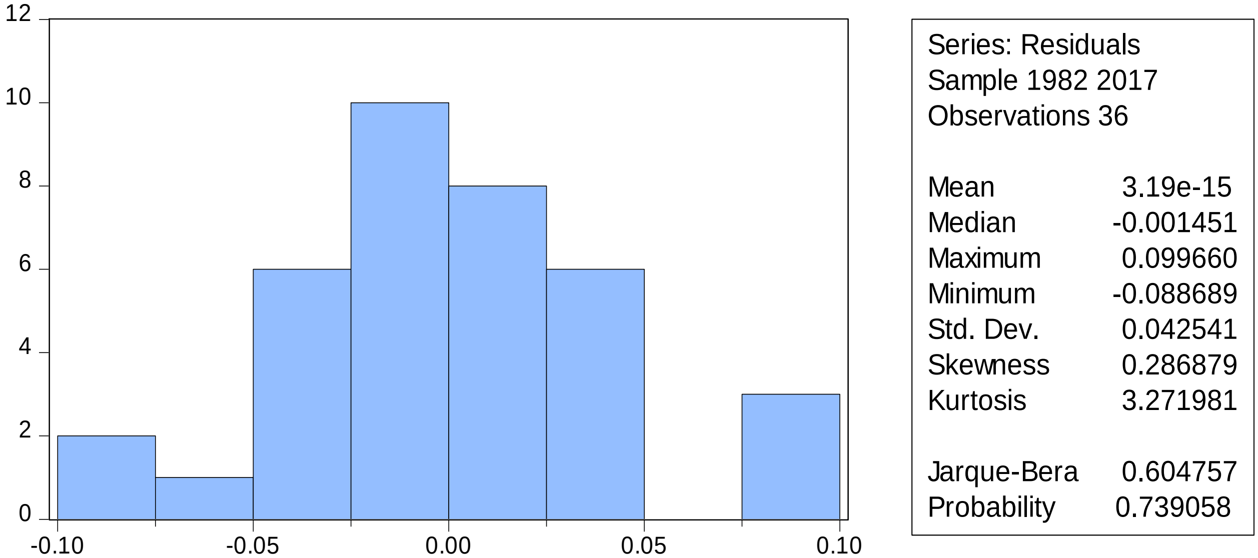
4.5. Model Diagnostics Test

To ensure that whether the models is feasible or not, the different model diagnostic technique is performed. These testing techniques are presented as follo

4.5.1. Normality test

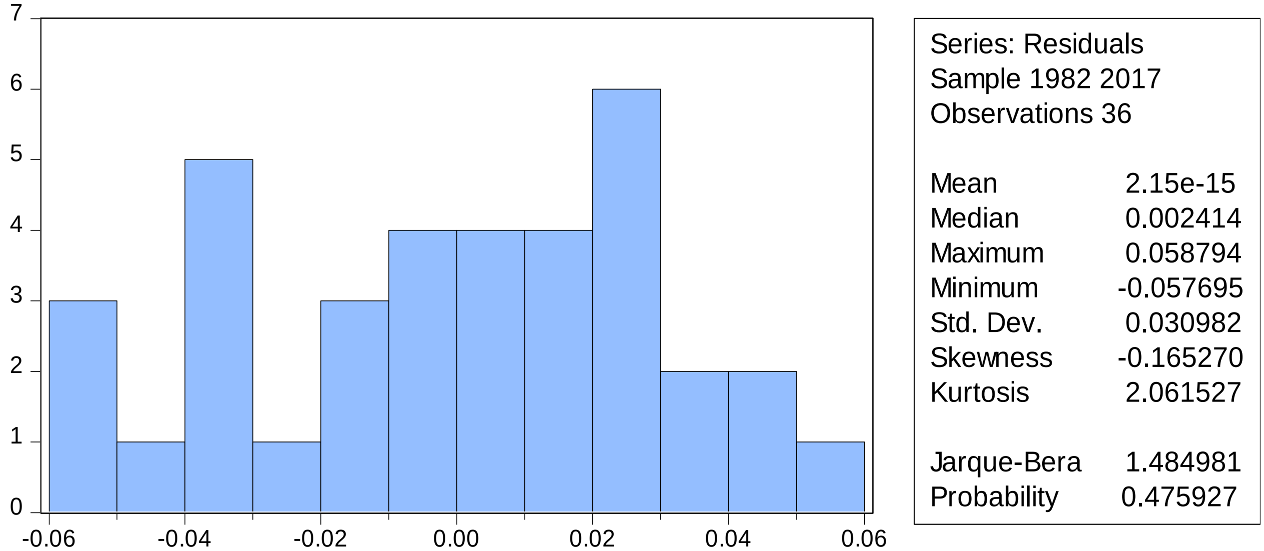
Normality test of data is applied to determine whether a data is well-modeled by a normal distribution or not and to compute how likely an underlying random variable is to be normally distributed. If the computed p-value of the jarque-Bera statistic in an application is sufficiently low one can reject the hypothesis that the residuals are normally distributed. But, if the p-value is reasonably high we do not reject the normality distribution (Gujarati, 2004). As the figure 4.1 and figure 4.2 shows, the residuals from the regression seem to be symmetrically distributed. Application of the Jarque–Bera test shows that the JB statistic is about 0.604757 and 1.484981 whereas the probability of obtaining such a statistic under the normality assumption is about 0.739058 and 0.475927 for the life and non-life model, respectively. Therefore, we do not reject the hypothesis that the error terms are abnormally distributed.

Figure 4. 1 Normality test (life insurance Model)



Source: survey data, 2017

Figure 4. 2 Normality test (Non-life insurance Model)



Source: survey data, 2017

4.5.2. Test for serial correlation

The most serious problem with the d test (Durbin –Watson test of autocorrelation) is the assumption that the regressors are non-stochastic, that is, their values are fixed in repeated sampling. If this is not the case, then the DW test is not valid either infinite or small, samples or in large samples. And since this assumption is usually difficult to maintain in economic models involving time series data, one author contends that the Durbin–Watson statistic may not be useful in econometrics involving time series data. In his view, more useful tests of autocorrelation are available, one such test is the Breusch–Godfrey test of autocorrelation (Guajarati, 2004). To avoid some of the drawbacks of the Durbin–Watson d test of autocorrelation, statisticians Breusch and Godfrey have developed a test of autocorrelation (which is also known as LM test) that is general in the sense that it allows for (1) non-stochastic regressors, such as the lagged values of the regressand; (2) higher-order autoregressive schemes; (3) simple or higher-order moving averages of white noise error terms. Based on this the study is used the LM test to detect the problem of serial correlation within both models.

Decision rule

H0: Obs*R-squared -value >5% ==>accept null hypothesis i.e. there is no serial correlation

H1: Obs*R-squared -value <5% ==>reject null hypothesis i.e. there is no serial correlation

Table 4. 8 Life insurance model serial correlation test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.642629	Prob. F(2,17)	0.2227
Obs*R-squared	5.830306	Prob. Chi-Square(2)	0.0542

Source: survey data, 2017

Table 4. 9 Non-life insurance model serial correltion test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.256936	Prob. F(2,15)	0.3128
Obs*R-squared	5.167299	Prob. Chi-Square(2)	0.0755

Source: survey data, 2017

As shown above, in table 4.8 and 4.9 the study is applied Breusch-Godfrey Serial Correlation LM Test to test for the existence serial correlation problem in the model. Because the p-value of the chi-square is greater than 0.05 in both models so, we can accept the null hypothesis that there is no serial correlation. This implies that the models are free from serial correlation problems.

4.5.3. Heteroskedasticity test

If the variance of the residuals is not constant then the residual variance is said to be heteroscedastic. Heteroskedasticity is a systematic pattern in the errors where the variances of the errors are not constant (Gujarati, 2003). Heteroskedasticity makes the estimated coefficient of the parameters not efficient because the estimated variances and covariance of the coefficients (βi) are biased and inconsistent. Thus, the tests of hypotheses are no longer valid.

Table 4. 10 Non-life insurance model Heteroskedasticity Test: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.875178	Prob. F(18,17)	0.1008
Obs*R-squared	23.94165	Prob. Chi-Square(18)	0.1569
Scaled explained SS	2.833662	Prob. Chi-Square(18)	1.0000

Source: survey data, 2017

Table 4. 11 Life insurance model Heteroskedasticity Test: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.845149	Prob. F(16,19)	0.6296
Obs*R-squared	14.96833	Prob. Chi-Square(16)	0.5270
Scaled explained SS	4.736420	Prob. Chi-Square(16)	0.9969

Source: survey data, 2017

White‘s test was applied to test the presence of heteroskedasticity. White‘s test tests the null hypothesis that the variance of the residuals is homogenous. If the p-value is very small, we would have to reject the null hypothesis. In this case, both the F- statistics and chi-square of the test statistic gives the same conclusion that there is no evidence for the presence of heteroscedasticity problem since the p-values are considerably in excess of 0.05. The third version of the test statistic, Scaled explained SS‘, which as the name suggests is based on a normalized version of the explained sum of squares from the auxiliary regression, similarly suggests there is evidence of no heteroscedasticity problem.

4.6. Model Stability test

Regression analysis of time series data is usually based on the assumption that the regression relationship is constant over time. However, in some applications, particularly in social and economic fields the validity of this assumption is open to questions and it is often desirable to examine it critically, particularly if the model is to be used for forecasting. According to Brown et al (1975), the recursive residuals seem preferable for detecting the change of model over time since until a change takes place the recursive residuals behave exactly as on the null hypothesis. The null hypothesis of the recursive residuals are independent and normally distributed with means zero and constant variances. Moreover, recursive residuals which are defined to be uncorrelated with zero means and constant variance can be tested using the cusum and cusum of square techniques Brown et al (1975).

4.6.1. *Cusum* test

This test examines to reveal the departures of the mean of the residuals from zero as one travels along with the series through time. This test is a suitable procedure that plots a pair of lines lying symmetrically above and below the line where the mean=0. Here figure 4.3 below shows the *cusum* series lies between the upper and lower critical lines. This indicates that the model is stable using *cusum* test in both models (i.e. life and non-life insurance). So, the null hypothesis that the model has stability is accepted and there is no structural change over time in the model.

Decision rule

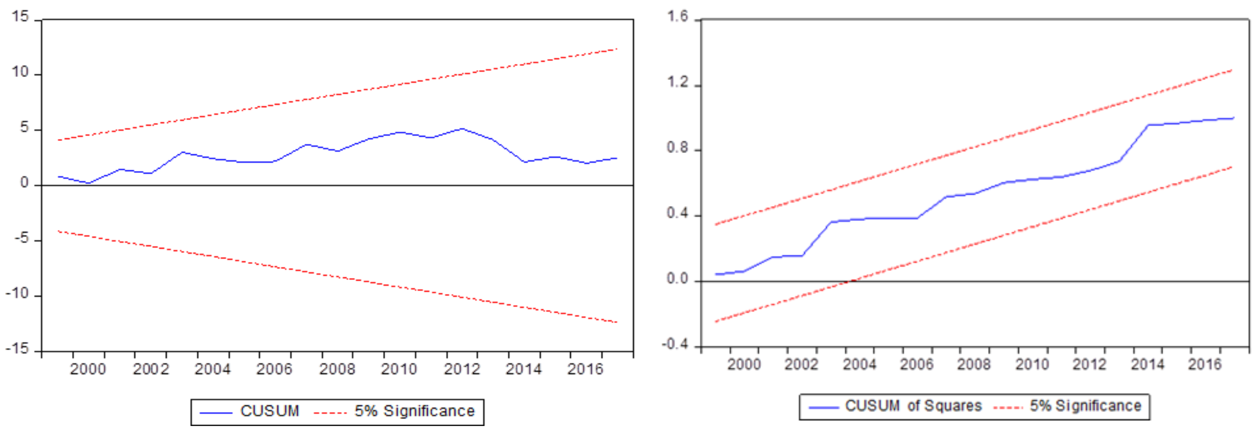
- If the *cusum* series lies between the upper and the lower critical lines we will accept the null hypothesis that is no structural change over time.
- If the *cusum* series crosses the upper or the lower critical lines we will reject the null hypothesis and the model has structural change over time (i.e. there is model instability)

4.6.2. *Cusum* of square test

This test uses the squared recursive residuals and provides a useful complement to the *cusum* test, particularly, when the departure from the constancy of the βt's is haphazard rather than systematic. If the lines pass outside of the critical boundary, there is instability of the modes. Furthermore, if the plots of the tests statistics are within the 5% critical bound, the null hypothesis of all coefficients of the regression cannot be rejected and thus stable.

Figure 4.3 and 4.4 below shows the result of *cusum and cusum square* techniques of model stability test.

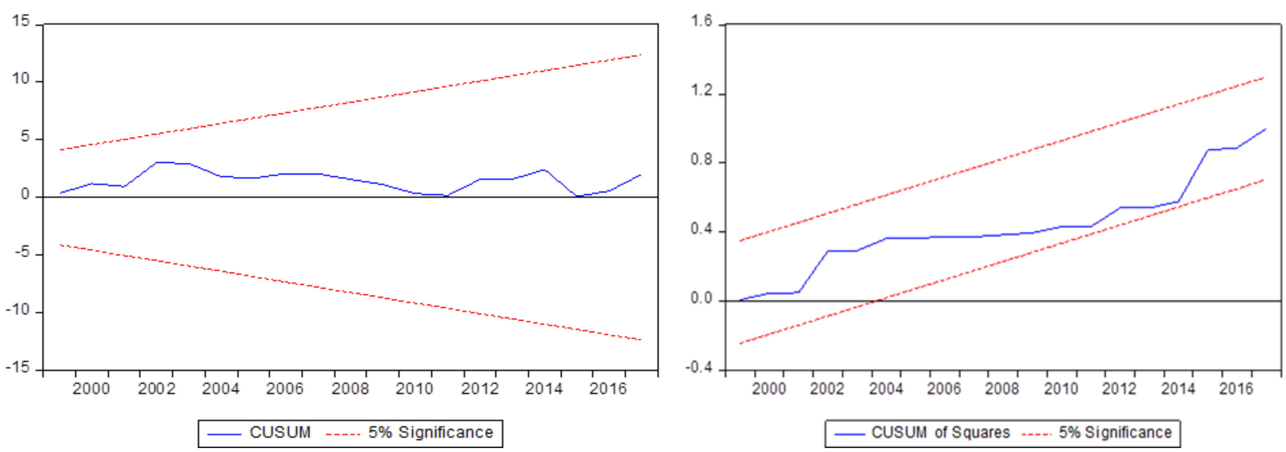
Figure 4. 3 ***life insurance model stabilty test***



Source: survey data, 2017

As shown in figure 4.3. above the life insurance model is stable which is confirmed by both cusum and cusum squere stability testing techniques.

Figure 4. 4 ***Non − life insurance model stability test***



Source: survey data, 2017

The above figure 4.4. confirms that the non-life insurance model of the study is stable.

4.7. Empirical results and discussions

In this section, the researcher presents the short run and long run regression output of the model and a brief discussion of the finding of the study. Finally, the hypothesis of the study is tested.

Table 4. 12 Life insurance long run regression output

Variable	Coefficient	Std. Error	t-Statistic	Prob.
I	0.699930	0.153608	4.556593	0.0002
GDP	0.045565	0.018941	2.405670	0.0265
FID	0.031683	0.009653	3.282200	0.0039
DR	0.012893	0.010455	1.233245	0.2325
CPI	-0.013858	0.006354	-2.180799	0.0420
TO	0.031290	0.011050	2.831660	0.0107
URB	0.680887	0.174096	3.910984	0.0009
C	-0.921066	1.897862	-0.485317	0.6330

Source: survey data, 2017

$$lnLP = -0.9211 + 0.6999 * GDP\ per\ capita + 0.0456 * GDP\ growth + 0.0317 * FID + 0.0129 * DR - 0.0139 * CPI + 0.0313 * TO + 0.6809 * URB$$

The above table 4.12 shows the long run regression out put of the life insurance model and it indicates that almost most of the explanatory variables has a significant impact on the long run life insurance premium. however, deperndency ratio is not statically significant to influence life insurance premium in the long run.

Table 4. 13 Non-life insurance long run regression out put

Variable	Coefficient	Std. Error	t-Statistic	Prob.
I	1.031043	0.045602	22.60936	0.0000
GDP	-0.002112	0.002375	-0.889282	0.3863
FID	0.000854	0.002857	0.299109	0.7685
DR	0.001714	0.002412	0.710737	0.4869
CPI	-0.005131	0.002534	-2.025048	0.0589
TO	0.014176	0.002672	5.305727	0.0001
URB	0.117754	0.045163	2.607317	0.0184
C	4.563980	0.411974	11.07831	0.0000

Source: survey data, 2017

Table 4.13. presents the long run regression result of the non-life insurance model of the study.

$$LnNLP = 4.5640 + 1.0310 * I + 0.0021 * GDP + 0.0009 * FID + 0.0017 * DR - 0.0051 * CPI + 0.0142 * TO + 0.1178 * URB$$

Table 4. 14 Life insurance short run (ECM) regression output

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(I)	1.258648	0.213691	5.890031	0.0000
D(I(-1))	-1.359968	0.257352	-5.284476	0.0000
D(GDP)	0.003689	0.001159	3.184019	0.0049
D(GDP(-1))	-0.005048	0.001553	-3.250501	0.0042
D(DR)	-0.010855	0.002714	-3.999569	0.0008
D(TO)	-0.003969	0.002227	-1.782622	0.0906
D(TO(-1))	-0.007363	0.002623	-2.807304	0.0112
D(URB)	0.479721	0.064688	7.415883	0.0000
CointEq(-1)*	-0.373699	0.046390	-8.055511	0.0000

R-squared	0.770508	Mean dependent var	0.048583
Adjusted R-squared	0.702510	S.D. dependent var	0.088803
S.E. of regression	0.048435	Akaike info criterion	-3.004852
Sum squared resid	0.063342	Schwarz criterion	-2.608972
Log likelihood	63.08733	Hannan-Quinn criter.	-2.866679
Durbin-Watson stat	2.542062		

Source: survey data, 2017

Table 4.14 above and Table 4.15 below indicates the short run (error correction model) regression out put of both the life and the non-life insurance model of the study and shows that most of the explanatory variables are found significant to affect the premium volume of the life and the non-life insurance business in Ethiopia.

Table 4. 15 Non-life insurance short run (ECM) regression output

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(I)	-0.054586	0.141354	-0.386169	0.7042
D(FID)	-0.010303	0.003450	-2.986263	0.0083
D(DR)	0.001323	0.001962	0.674052	0.5093
D(DR(-1))	-0.012641	0.001942	-6.510337	0.0000
D(CPI)	-0.001572	0.000452	-3.477046	0.0029
D(CPI(-1))	0.001642	0.000521	3.149348	0.0059
D(TO)	0.006238	0.001819	3.429642	0.0032
D(TO(-1))	-0.008621	0.002207	-3.906852	0.0011
D(URB)	0.078070	0.037496	2.082076	0.0528
D(URB(-1))	-0.059697	0.036343	-1.642599	0.1188
CointEq(-1)*	-0.984929	0.102014	-9.654806	0.0000

R-squared	0.870170	Mean dependent var	0.052630
Adjusted R-squared	0.818238	S.D. dependent var	0.085985

S.E. of regression	0.036658	Akaike info criterion	-3.527889
Sum squared resid	0.033596	Schwarz criterion	-3.044036
Log likelihood	74.50200	Hannan-Quinn criter.	-3.359011
Durbin-Watson stat	2.171935		

Source: survey data, 2017

Table 4.14and 4.15 show the short-run regression result of the ARDL model of the study for both the life and the non-life insurance. The coefficient of determination (R^2) of the model which shows the percentage of the response variable variation explained by the model, implies that the model explains 77.05% of the variation in life insurance and 87.01% of the variation in the non-life insurance. The short-run error correcting term($CointEq(-1)*$) indicates by how much does the long run disequilibrium is being corrected or the extent to which any disequilibrium in the previous period is being adjusted in year Y_t, its value should negative and also significant. In the above regression output, the error correcting term shows negative 0.373702 and 0.984929 for the life and non-life insurance respectively, and this implies that to correct the long run disequilibrium in the model it takes almost 3 years for the life insurance and almost 1 year for the non-life insurance.

4.7.1. Interpretations of the findings from the models

A. Insurance premium and income

In the long-run regression result GDP per capita has found to affect the life and non-life insurance positively and significantly consistent with previous studies. This positive and statistically significant relationship between the insurance premium and income is due to the fact that, the larger the level of income the more insurance consumers can afford to purchase and also individual's consumption increases along with income for many reasons. Related with this the theoretical model of Begg et al (2000) suggests that insurance demand is expected to be a normal good with a positive income elasticity of demand which implying that the poor are less likely to insure.

With respect to life insurance, the long run coefficient of the variable GDP per capita is 0.699931 percent and significant at 1% level of significance. This implies that other things remain constant, a 1% increase in per capita income of citizen leads to increase life insurance demand by 0.6999%. This means that increasing income can create a greater demand for insurance to safeguard the income potential of the insured and the expected consumption of his/her dependents. Not only this, but the increased income also might be the reason why people directs a part of their earnings toward retirement and buy insurance products particularly life insurance as saving alternative, for example, annuity life insurance. This result is confirmed with the theoretical finding of Yaari (1964) that suggests the demand for insurance is dependent on the expected earning of individual during his lifetime which is as an individual expects to earn more income his demand for insurance will increase and vice versa. In addition, This finding is also consistent with previous empirical results which are conducted on the area of life insurance such as Amrot (2012), Begg, et al 2000, Dickinson, Khajuria (1986), Truett and Truett (1990), Browne and Kim (1993), and Outreville (1996), Beck and Webb, (2003) Celik and Kayali (2009), Hwang T. and Gao S. (2003), Li et.al (2007), Aderaw (2013).

The coefficient of GDP per capita in the non-life insurance long-run regression output shows positive 1.044 percent. This reveals that other things remain unchanged, in the long run, a 1% increase citizen's per capita income can increase future non-life insurance demand by 1.044% and this is significant at 1% level of significance. This means that with increasing income individuals prefer to spend more money to meet their needs and buy goods and services such as houses and vehicles that need to be insured and this may create a greater demand for the non-life insurance to protect their assets against future unexpected economic loss. This result is consistent with the finding of Poposki et al (2015) which suggests that obviously increased income allows for higher consumption in general, makes insurance more affordable and creates a greater demand for non-life insurance to safeguard acquired property. In addition, there are also other previously conducted researches found similar result such as the insurance theory of Yaari (1964), and empirical researches by Trinh et al (2016), Petkovski et al (2014), Beenstock et al (1988), Munir and Khan (2012), Celik and Kayali (2009), Beenstock, Dickinson, and Khajuria (1988), Eglantina and Elena (2014), Zhang C. and Zhu N. (2004), Petkovski M. & Jordan K. (2014), Dragos L.S. (2014), Jordan et al (2015), Nguyen et al (2016), Begg et al 2000, Brown et al (2000).

Moreover, the short-run regression result shows that the one-year lagged effect of income affects life insurance demand positively. Its short run coefficient indicates that when the current period disposable income increased by 1% the following year life insurance premium might be increased by 1.25%. Whereas the two years lagged effect of GDP per capita on life insurance demand is negative and also statistically significant at 1% level. The coefficient can be interpreted that a 1% increase in disposable income can reduce the short run life insurance premium by 1.4%. This suggests that the level of income may lead to a negative perception for the need for life insurance products early in the short run, with consumers opting to use funds to consume other necessity goods or they consume insurance after priority needs are satisfied when their disposable income increases. However, the short-run regression output shows that the variable GDP per capita has no significant impact on non-life insurance demand.

B. Insurance premium and Economic growth

In the above long-run regression result the variable GDP has found positive and significant with respect to life insurance. The coefficient of this variable tells that, other things holding constant, the 1-unit growth in GDP will increase life insurance premium by 4.55 percent in the long run. The reason might be that economic growth will increase employment and population with adequate employment may direct part of their income for purchase of life insurance products for many reasons. This result is agreed with Abbas and Ning (2016). In addition, Burić et al (2017) also found a similar result and suggest that as the economy grows saving and investment will increase and also insurance consumption of the country. As life insurance is one form of saving instrument and security against risk demand for life insurance will increase at the same time.

Further, in the short-run, the one-year lag value of the variable GDP has a positive and significant influence on life insurance premium. This is to imply that other things remain constant, as the current year economy grows by one unit the following year life insurance premium can be raised by 0.3689 percent and is statistically significant at 1%. This is because as an economy develops Higher will be the income generated by the people and life insurance products become more available to citizens. Due to this, they change the list of their needs and instead of considering the consumption of some basic needs, their preferences change towards family, health, old age and this leads to increase the life insurance premium. However, the drop in living standard and the higher unemployment rate has caused most citizens to turn to mainly basic needs, while only the citizens with higher incomes afford insurance. However, the coefficient of the two-year lag value of GDP shows negative 0.005048 which means that when the current year economy grows by 1 unit the after two-year life insurance premium might be reduced by 0.5048 percent.

With respect to non-life insurance, the above long-run regression output shows that economic growth has no significant influence on non-life insurance demand. This might be as the economy grows the more the economic activity will be in the country which enables the people to create more wealth due to the increase in their per capita income. The increase in per capita income enables citizens to accumulate wealth and this accumulated wealth gives the people a potential to protect themselves (to self-insure) against future property loss instead of transferring the risk to a third party (i.e. insurance companies) which leads to decrease the demand for non-life insurance. in line with this, for companies anticipating higher economic growth, they may opt to underinsure and invest their capital reserves in other financial instruments to cover for potential damages or losses should they occur. Additionally, if claims processes are inefficient, companies may be opting to maintain reserves to cover damages or losses if event occur frequently as opposed to waiting for insurance companies to pay out. Consistent with this finding the finding of Mossin's (1968) model suggests that other things holding constant, insurance would be an inferior good i.e. the rich backed by greater funds would be more likely to self-insure and demand less insurance cover leading to reduce the insurance premium. However, this result is contradicted with the result of previous studies such as the finding of Outriville (1990) which founds that economic growth is among the significant factors that influence to increase the property-liability insurance consumption of countries.

C. Insurance premium and financial development

The life model long-run regression output shows that financial sector development (FID) has a great influence on the demand for life insurance in Ethiopia. This may be due to the fact that financial sector development is associated with the widespread securitization of cash flows, which enables households to secure future income through the ownership of financial assets. By offering similar benefits, life insurance is expected to generate higher sales in countries with a high level of financial development and this increase life insurance demand because peoples aware the importance of financial instruments and they will start to use life insurance products as saving alternatives. In addition, well-functioning banks and other financial institutions may increase the confidence consumers have in other financial institutions such as insurance which offers almost similar financial services. Further, these financial institutions, especially banks, provide insurers with an efficient payment system which enable insurers to offer quality and efficient insurance service to their clients and this also increase the demand for their services. In relation to this, Patrick (1966) suggests that the lack of financial growth is a manifestation of the lack of demand for financial services. In addition, he noted that as the real side of the economy develops (i.e. the financial system), demand for various new financial services (such as insurance services) materializes. As shown above, the long-run coefficient of the variable FID is 0.031684 for life insurance and significant at 1% level of significance. This implies that a 1 unit growth in the level of financial or banking development would increase future life insurance premium by about 3.17%. This finding is consistent with (Lewis (1989), Sen (2008), Jordan K. (2012), Beck and Webb (2003), Munir and Khan (2012).

Further, the other benefit of banking sector development is that sometimes banks require the borrower to purchase insurance for the collateral pledged before taking the loan which increases demand for property liability insurance. However, with regard to the non-life, the variable FID has found no significant influence. This tells that the growth or decline of the financial sector has no significant influence on non-life insurance demand. This might be due to the fact that in Ethiopia non-life (property liability) insurance is acquired mostly because the purchase of such insurance policies is compulsory such as motor insurance which leads us to the conclusion that a financial sector development does not necessarily lead to higher consumption of non-life insurance products in Ethiopia. And also as banks and other financial institutions are developed in terms of access, stability and efficiency; people may use loans from these financial institutions to cover uninsured loss. This may be due to higher price of insurance products or misunderstood of customers to consider it. Further, the short-run regression output founds a significant and negative effect of financial development on non-life insurance. Its short run coefficient can be interpreted as the level of financial sector grows by 1 unit the short run non-life insurance premium might be reduced by about1.03 percent.

D. Insurance premium and dependency ratio

Both the life and the non-life long-run regression output of the study shows the variable dependency ratio has no significant influence on insurance premium in Ethiopia. This implies that an increase or decrease in DR has no impact on life and non-life insurance premium. Most of the Ethiopian people do not use insurance as a means of saving instrument to protect dependent's against financial hardship at the time of premature death of the family breadwinner. This may be whether due to low income of the people which hinders them to afford the premium amount charged; due to other saving alternatives such as modern bank saving, traditional savings such as (iqub and idir) or due to lack of the people's awareness about insurance, insurance policies and benefits of insurance. In addition, in Ethiopia, the government pension system is also used as a means of saving for the retirement periods which makes the employed people not to consider insurance as a saving instrument for their elderly time. This study's empirical result is consistent with Amrot (2014) in Ethiopia. However, this contradicts with the finding of Hammond, Houston, and Melander (1967) and Campbell (1980) which suggests one of the main purposes of life insurancee is to protect dependents against financial hardship in the case of the wage earner's premature death and with Lewis et al (1986) and Truett and Truett (1990) which found an evidence that the consumption of life insurance and the number of dependents in a country are positively related.

In the short run, the one-year lag value of the variable DR is not significant to influence the non-life insurance premium, but it affects the premium of life insurance business negatively and significantly and this implies that as dependency ratio increases by 1 unit the short run life insurance premium can be reduced by about 1.1%. However, the two-year lag value of the variable DR affects the short run non – life insurance premium significantly but negatively. This indicates that as the current year dependency ratio raises by 1 unit after two-year non-life insurance premium might be fall by 1.26% and. But, the short run regression result of the life insurance shows that the two-year lag value of the variable DR has no influence on life insurance premium.

E. Insurance premium and inflation

The long-run regression output of the variable CPI shows that inflation as an important factor that affects the premium of life and the non-life insurance business significantly but its effect is negative. Its long-run coefficient implies that other things remain constant, as the level of inflation increases by 1 unit the future premium volume of life and non-life can be decreased by 1.4 and 0.513 percent, respectively. This might be as monetary uncertainty has a substantial negative effect on the expected returns of insurance products because life insurance saving products typically provide monetary benefits over the long-term. Moreover, inflation erodes the value the money provided in the future by the insurer to the potential beneficiary upon the maturity of the policy and also because inflation reduce the purchasing power of consumers disposable income, this can make consumers prioritize more to consumption of necessary goods, and makes them give less attention to additional financial services products such as insurance. In addition, in times of high inflation and significant economic volatility, consumers seek short term, more liquid investments and avoid long term fixed commitments such as life insurance products which are perceived as long term, fixed commitments. Therefore, demand for such financial instruments shrinks during inflationary or volatile times. Consistent with this, the theoretical finding of Lewis (1989) suggests that the stability of the monetary system is among the substantial factors that derive the consumption of insurance. This study finding is also agreed with the empirical finding of Babbel (1981) which suggests inflation lowers the value of financial assets and therefore reduces the attractiveness of insurance product. (Feyen et al., 2013) also suggests that the reason for the negative effect of inflation on insurance sector development lies in the fact that in life insurance inflation lowers the future value of insurance and decreases the purchasing power of any monetary unit. This, in turn, causes lower purchasing ability of the country's citizens, which then influences non-life insurance too. A sharp rise in inflation can have a negative effect on demand and may lead to policy cancellations and increasing costs.

In the short run the regression output shows inflation has no impact in the short run life insurance premium but with respect to the non-life insurance consistent with long run it indicates that the one year lagged value of inflation affects the short run non-life premium negatively and significantly at 1% significance level whereas the inflation two years lagged value affects the short run non-life premium positively and significantly at 1% level of significance. Consistent with this study other researcher's finds similar negative effect of inflation on insurance demand, among those researchers like (Sen (2008), Beck and Webb (2003), Browne, M. J., & Kim, K. (1993), Li et.al (2007), Celik and Kayali (2009), Abbas A. O. & Ning L., (2016), Jordan et al (2015) Amrot (2014), Sulaiman (2015) and Aderaw (2013) find the same result.

F. Insurance premium and trade openness

The long-run regression output indicates that the variable TO influences premium of life and non-life insurance positively and significantly. Its long-run coefficient shows 0.0312 and

0.01425 for the life and the non-life insurance, respectively. This is to mean, other things remain unchanged, as the level of import-export trade activity raises by 1 unit the long run premium volume of life and non-life insurance could be raised by 3.12% and 1.425%, respectively. This implies that more openness (i.e. higher ratio) would have a positive impact on insurance demand, as increased trade would require more companies to protect their goods and/or services against potential future losses or damage, increasing the need for non-life insurance products. Thus, the growth of import-export activity influences positively the insurance demand of a country. Consistent with this (Newbery and Stiglitz, 1984, Svalery and Vlachos, 2002) notes that trade openness contributes to the development of the financial sector by increasing the demand (necessity) for insurance products due to increasing uncertainty, income volatility, foreign competition, and higher exposure to external shocks. In addition, (Petkovski and Jordan (2014) suggest that the more open countries accumulate more insurance assets.

Further, consistent with the long-run regression result, the short run one year lagged effect of trade openness is found to affect non-life insurance positively and significantly but it affects the life insurance business negatively. Whereas the short-run two-year lag value of trade openness is found negative and significant to influence both life and non-life insurance as shown in the short run regression output.

G. Insurance premium and urbanization

The above long-run regression output shows that other things holding constant, a 1unit increase in the level of urban growth leads to increase the long run insurance premium of life and non-life insurance by 68.1 and 11.77 percent, respectively. In addition to this, in the short run as the current year level of urbanization grow by 1 unit the following year insurance premium of life and non-life insurance can also be raised by 47.97 and 7.8%, respectively. However, the short-run two years lagged effect of the variable URB is not significant to the life and non-life insurance.

Both the long run and the short run regression output of the study indicates that urbanization is the most important and significant factor which have a positive influence on the premium size of life and non-life insurance in Ethiopia. The reason behind its significant and positive influence might be that, the risk of car accidents and thefts are higher in urban areas which lead urban inhabitants to buy insurance policy caused the fear of such risks and also a more urbanized population often leads to a higher motor vehicle ownership, which increases the demand for motor insurance to protect themselves against property loss or against third party liability. And also, a higher degree of concentration of population in a specific area is advantageous to insurers because it reduces the cost marketing, distribution, underwriting as well as cost of claims' administration. Further, the increasing population shift from rural to urban areas due to industrialization creates job and increases the income of the people and can afford life insurance products and also urbanization raises awareness regarding these products especially for their retirement period or for the protection of their assets. Related with this, Eglantina et.al (2014) suggested that urbanization has a positive effect to people to know about risk management and how to be protected from events that cause a loss for them, leading to a higher demand for insurance. In addition, Browne, Chung, and Frees (2000) discovered that the rate of interaction between individuals increases in urban areas, and they used urbanization as a proxy for loss probability: if the probability of loss increases, the insurance demand increases too. Besides, Esho, et al (2004) considered that additional sources of security are needed, as consequences of increasing delinquency are caused by the greater concentration of assets in an urban area, then this leads to increase life insurance consumption. Hwang and Gao (2003) concluded that urbanization determines smaller families with no economic security, which makes insurance an efficient tool for providing financial security. This study empirical result is also consistent with the findings of other previous researchers like (Yaari (1964), Lewis (1989), Sen (2008), Eglantina & Elena (2014), Gao et.al, (2003), Park and Lemaire (2011), Munir and Khan (2012), Eglantina and Elena (2014), Dragos (2014), Nguyen et al (2016).

Table 4. 16 Summary of hypothesis testing

	Expected outcome		Actual outcome		Decision
Variable	life	non-life	life	non-life	
GDP per capita	Pos&sig	Pos&sig	Pos&sig	Pos&sig	Accept
Economic growth	Pos&sig	Pos&sig	Pos&sig	Neg&ins	Fail to reject
Inflation	Neg&sig	Neg&sig	Neg&sig	Neg&sig	Accept
Financial development	Pos&sig	Pos&sig	Pos&sig	Pos&ins	Accept
Trade openness	Pos&sig	Pos&sig	Pos&sig	Pos&sig	Accept
Dependency ratio	Pos&sig	Pos&sig	Pos&ins	Pos&ins	Accept
Urbanization	Pos&sig	Pos&sig	Pos&sig	Pos&sig	Accept

Where, Pos = Indicates positive, sig= significant, Neg= Negative, ins= Insignificant

Chapter five

Summary of major finding, Conclusion, and Recommendation

This chapter presents conclusions of the main findings of both the long-run and the short-run ARDL regression output of this study on the relationship between insurance business development and the selected economic and demographic variables and also some possible recommendations based on the regression result as well as recommendations for further researchers is presented.

5.1. Conclusion

Different Sources shows that in Ethiopia the insurance business contribution to the national economy as compared with other African countries is small and the level of development of the insurance sector of the country can be said as it is in its emergent stage which calls for serious attention. Since understanding the factors that influence the insurance business in Ethiopia is important to enhance the sector; this study aims to examine the factors that potentially and significantly drive insurance business development in Ethiopia. The dependent variable of the study was insurance business development measured by the annual total insurance premium. The explanatory variables of the study were, selected economic (GDP per capita, economic growth, inflation, financial development, trade openness) and demographic (urbanization and dependency ratio) variables that were identified as potential determinants of insurance business development in most of previous theoretical and empirical work. In line with this, the researcher analyzed the effect of these demand leading external factors for life and the non-life insurance business separately. Further, in line with the objective of the study the researcher adopted explanatory research design with quantitative research approach and used secondary annual time series data of 38 years which covers the period 1980 up to 2017 that were collected from Ethiopia insurance corporation (EIC), National Bank of Ethiopia (NBE) and World Bank.

Data's of the dependent and the independent variables were tested its stationarity using ADF and PP stationarity testing techniques before using for further analysis. Based on this, the variable GDP and CPI are stationary at a level whereas the variable I, FID, TO, DR and URB were found their stationarity after first difference. Further, the bound co-integration technique was used to see the existing long-run relationship between the variables of the study and found that the variable has a long run relationship. Based on this, the researcher adopted the autoregressive distributed lag model (ARDL) estimation technique to estimate the short run and long-run relationship between the variable of the study. In addition, the researcher tested the validity of the model by applying Normality, Heteroskedasticity, serial correlation testing techniques and confirms that the model is feasible. Finally, the study used $cusum\ and\ cusum\ squere$ testing techniques to test the stability of the model and found that the model is stable.

As far as the result of the study, with regard to the life insurance, the study found that income, Economic growth, financial development, Inflation, trade openness, and urbanization were the most significant drivers of life insurance premium in Ethiopia. However, the dependency ratio was found insignificant to influence the demand for life insurance in Ethiopia. Specifically, the study found an increase in citizen's per capita income, financial sector development, urban growth, import-export activity, and economic growth has a positive and significant influence on life insurance demand. Whereas the level of inflation affects life insurance demand negatively and significantly. Further, in the short run income, economic growth, dependency ratio, trade openness, and urbanization were the factors that can significantly affect the short run life insurance demand.

Concerning the non-life insurance, the empirical outcome of the study has shown that income, inflation, trade openness and urbanization were the factors that significantly affect demand for non-life insurance. However, the regression output of non-life model indicates that in the long run the increase or decrease in economic output and dependency ratio has no significant impact on non-life insurance growth. Particularly, the non-life model output indicates that citizens per capita increment, increase in import-export trade and urban growth are the factors that affect the non-life insurance premium positively whereas inflation affects non-life insurance premium negatively. Further, in the short r,un, the variables such as financial development, dependency ratio, inflation, trade openness, and urbanization affect the non-life insurance premium significantly.

To summarize, the aforementioned results clearly state that insurance premium is significantly influenced by all these relevant economic and demographic indicators in the long run and in the short run and therefore confirm the importance of macroeconomic environment and demographic structure of the country for the development of the insurance market in Ethiopia.

5.2. Recommendations

Based on the result of the study the following are recommended

- To broaden the scope of products available, and increase insurance companies' gross premiums, insurance companies need to tailor their products to the unique needs of local companies and consumers in the market. Whilst the need to cover risks is clear, the desire to do so needs to be stimulated by new products and services from insurance companies operating in the country and educating customers on the benefits of these products is important. As a final option, enforcing mandatory insurance product lines may be the only option for insurance regulators to consider when looking to stimulate uptake of certain product lines. In addition, because the growth in the insurance sector has a great contribution to economic growth and the development of the country, the public should make its own contributions toward strengthening the insurance industry through raising its awareness regarding the benefits of insurance and use the insurance facility to transfer risks and also use the life insurance products as means of saving (in addition to securing protection).
- Insurance companies should respond to the general price fluctuations specifically during the period of high inflation rate. Inflation affects the value of money and the general price level in the economy and it reduces the willingness to purchase insurance policy because it will be expensive for an average household. So, insurance companies need to be flexible to insurance product price decisions during high inflation, since it affects the insurance demand of individuals. To hedge against inflation risks and boost yields, insurers should increasingly look at diversifying their investment portfolios by moving funds from traditional asset classes (e.g., Government securities and bank savings) to alternative assets such as commodities, real estate, and private equity.
- Insurance companies in Ethiopia are also advised to focus on expanding their distribution channels in urban centers where they may benefit from the lower cost of marketing, distribution, underwriting as well as the cost of claims' administration.
- Growth in the economy obviously increases income level of individual households and financial development of the country. This in turn contributes for the betterment of the living standards of the households. The better the living standard, the longer the life expectancy in the country also attaining this will encourage people to save for their retirement. In line with

this, the larger is level of income per capita, the more of insurance consumer can afford purchase insurance products for several reasons. So, enhancing the country's economic growth will have a great contribution toward development of the insurance sector.

5.3. Further research direction

In this section the researcher gives an insight for further researchers as possible researchable area especially for those who have an interest to study on the area of insurance. Thus, this study only tries to show the relationship between some demand leading external factors (i.e. selected economic and demographic variables) and insurance business development in Ethiopia. Beside the impact of economic and demographic factors the development of insurance should also be analyzed with respect of other demand leading institutional and socio-cultural factors as well as industry and firm specific factors (supply leading). In addition the negative impact of economic growth on non-life insurance business development needs further investigation.

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APPENDIX

Appendix A: Row data

	LNNONLIF	LNLIFE	GDP_PERC	FID	GDP_GRO	DR	CPI	TO	URB
1980	7.963008	6.682145	2.517792	14.00029	5.02	93.49193	3.903991	15.27665	3.832442
1981	7.955264	6.534787	2.514856	15.68074	0.83	94.70214	5.42722	15.37428	4.299678
1982	7.998024	6.506505	2.527579	16.56984	0.9	95.56143	5.227033	14.91616	4.670693
1983	8.03555	6.625827	2.558674	17.14355	8.2	96.12193	-0.17561	16.78544	4.943426
1984	8.12525	6.61721	2.510893	20.18993	-2.8	96.42217	9.047499	13.9861	5.075047
1985	8.112028	6.63053	2.575269	19.6124	-11.1	96.51476	20.46555	15.80935	5.139869
1986	8.163373	6.624695	2.579461	21.81923	9.7	97.15645	-11.8232	13.49819	5.139023
1987	8.191331	6.804753	2.587431	22.06677	13.9	97.52379	-4.66479	14.28187	5.156855
1988	8.221122	7.059526	2.588351	23.19908	0.5	97.7183	6.873009	12.26846	5.20037
1989	8.176716	6.966329	2.597388	24.01192	-0.4	97.79851	11.05196	11.32633	5.274591
1990	8.135797	7.053117	2.612359	26.6171	2.7	97.77165	5.004794	4.909436	5.371334
1991	8.135333	6.897902	2.656931	28.56886	-7.1	98.42102	44.99635	9.606411	5.474031
1992	8.082455	6.885192	2.682256	30.64243	-8.7	98.80768	2.052897	11.16558	5.517562
1993	8.29197	6.935809	2.771596	26.87201	13.1	98.96934	4.714303	20.28017	5.503102
1994	8.390946	6.901022	2.775545	28.94868	3.2	98.9444	6.293459	20.44628	5.38835
1995	8.451521	6.943841	2.84025	30.06483	6.1	98.74151	14.83535	21.26828	4.79019
1996	8.536649	6.967946	2.873574	28.98602	12.4	99.03318	-8.99874	19.79227	4.45532
1997	8.569924	7.030107	2.897202	29.64878	3.1	99.13093	-2.65252	26.57381	4.309384
1998	8.571071	7.053934	2.921316	34.64974	-3.5	99.05034	0.104496	26.03614	4.219183
1999	8.570776	7.019283	2.946802	33.53965	5.2	98.77836	10.39373	21.18828	4.169631
2000	8.624232	7.156632	2.964204	33.02242	6.1	87.8	1.894248	27.52823	4.169669
2001	8.654606	7.242726	2.956961	35.76457	8.3	87.2	-10.7734	26.41445	4.156425
2002	8.747472	7.274037	2.935452	39.20261	1.5	86	-1.2219	36.90181	4.156658
2003	8.748139	7.366946	2.965988	39.27283	-2.2	86.6	17.77338	35.0609	4.125637
2004	8.735359	7.415844	3.018547	38.50636	13.6	85.2	2.382991	40.30093	4.085038
2005	8.807218	7.506265	3.099088	37.4796	11.8	84.7	10.7473	40.90269	4.034978
2006	8.896347	7.597993	3.182138	34.96178	10.8	84.3	10.81986	35.9546	3.98968
2007	8.987751	7.71752	3.287883	32.68841	11.5	84.3	15.10268	36.49627	4.045452
2008	9.075059	7.869891	3.437326	27.25034	10.8	93	55.24131	28.62786	5.076525
2009	9.138617	7.962833	3.561279	24.41369	8.8	93	2.706865	36.51914	5.040951
2010	9.262513	8.042549	3.599422	27.06369	12.6	93	7.321393	36.84055	5.031495
2011	9.386128	8.204944	3.722817	28.22423	11.2	93	38.04408	35.28579	5.011264
2012	9.572242	8.408063	3.873249	25.34351	8.6	93	20.81219	32.18682	4.995731
2013	9.655312	8.476951	3.923868	27.1436	10.6	75	7.390356	34.12629	4.868452
2014	9.954024	8.399643	4.000472	28.06774	10.3	75	8.464137	30.9677	4.83078
2015	9.719641	8.409041	4.077131	28.60862	10.4	75	10.44641	27.23863	4.779629
2016	9.780103	8.311899	4.14277	28.88944	7.6	75	7.5	24.15419	4.731261
2017	9.849957	8.283765	4.20348	31.73731	10.2	75	8.8	23.03368	4.674065

Source: National Bank of Ethiopia (NBE), World Bank development indicators and Ethiopian Insurance Corporation (EIC) Note GDP per capita, non-life premium and life premiums are expressed in log form and the rest are taken in their original data.

Appendix B. Multicollenearity test (Variable inflation factor)

Life insurance

Variance Inflation Factors
Date: 05/27/19 Time: 02:13
Sample: 1980 2017
Included observations: 36

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
LNLIFE(-1)	0.018776	10930.05	73.99603
GDP_PERCAPITA	0.219415	23353.57	643.1148
GDP_PERCAPITA(-1)	0.450414	46407.31	1189.387
GDP_PERCAPITA(-2)	0.169099	16873.74	396.4542
GDP_GROWTH	6.90E-06	5.730866	3.245861
GDP_GROWTH(-1)	4.11E-06	3.286809	1.936772
GDP_GROWTH(-2)	6.54E-06	5.161583	3.070698
FID	1.65E-05	151.9737	6.023484
DR	1.73E-05	1569.718	12.49701
DR(-1)	1.46E-05	1336.608	9.360044
CPI	2.35E-06	6.819131	4.731887
URB	0.011610	2877.643	29.06844
URB(-1)	0.004238	1046.258	10.87334
TO	9.54E-06	71.83722	9.900281
TO(-1)	1.20E-05	89.18058	12.72304
TO(-2)	2.23E-05	163.8696	24.24469
C	0.398385	4301.981	NA

Non-life insurance

Variance Inflation Factors
Date: 05/27/19 Time: 02:06
Sample: 1980 2017
Included observations: 36

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
LNNONLIFE(-1)	0.024675	32369.88	134.7635
LNLIFE	0.009730	9217.222	62.68789
GDP_PERCAPITA	0.293445	50158.31	1381.269
GDP_PERCAPITA(-1)	0.304079	50314.15	1289.517
GDP_GROWTH	6.46E-06	8.612964	4.878230
FID	6.03E-05	892.0345	35.35583
FID(-1)	4.79E-05	691.2692	31.57641
DR	1.07E-05	1564.712	12.45716
DR(-1)	1.50E-05	2216.066	15.51874
DR(-2)	7.75E-06	1154.296	6.910462
CPI	2.68E-06	12.44553	8.636118
CPI(-1)	1.40E-06	6.457323	4.511817
CPI(-2)	8.95E-07	4.126953	2.905892

TO	9.85E-06	119.1357	16.41874
TO(-1)	9.42E-06	112.5566	16.05801
TO(-2)	2.46E-05	289.9702	42.90142
URB	0.009940	3956.578	39.96728
URB(-1)	0.007061	2799.260	29.09158
URB(-2)	0.002985	1172.372	13.49326
C	0.775828	13454.29	NA

Appendix C. Unit root test output

Unit root test at level and intercept (ADF)

Null Hypothesis: LNLIFE has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.291958	0.9747
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LNNONLIFE has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.971996	0.9954
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: GDP_PERCAPITA has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		2.054745	0.9998
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: GDP_GROWTH has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.267016	0.0018
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: FID has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.157499	0.2246
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: DR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.688751	0.8373
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: CPI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.569213	0.0000
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: TO has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		-1.424155	0.5600
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: URB has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.058452	0.2619
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Unit root test at 1st difference and intercept (ADF)

Null Hypothesis: D(LNNONLIFE) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.537182	0.0000
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LNLIFE) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.110664	0.0002
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(GDP_PERCAPITA) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.423433	0.0166
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(GDP_GROWTH) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.389972	0.0000
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(FID) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.944735	0.0003
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(DR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.825195	0.0000
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(CPI) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.418784	0.0000
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(TO) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.533764	0.0000
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(URB) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.318127	0.0016
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Unit root test at level trend and intercept (ADF)

Null Hypothesis: LNNONLIFE has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.559551	0.7896
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LNLIFE has a unit root

Exogenous: Constant, Linear Trend
Lag Length: 2 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.714695	0.7233
Test critical values:	1% level	-4.243644	
	5% level	-3.544284	
	10% level	-3.204699	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: GDP_PERCAPITA has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.643227	0.9699
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: GDP_GROWTH has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.531163	0.0003
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: FID has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.620349	0.7654
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: DR has a unit root

Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.227993	0.4609
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: CPI has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.795220	0.0002
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: TO has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.430428	0.8350
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: URB has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.372388	0.3871
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Unit root test at 1st difference trend and intercept (ADF)

Null Hypothesis: D(LNNONLIFE) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.843694	0.0000
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LNLIFE) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.966474	0.0015
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(GDP_PERCAPITA) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.591006	0.0041
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(GDP_GROWTH) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.242893	0.0000
Test critical values:	1% level	-4.243644	
	5% level	-3.544284	
	10% level	-3.204699	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(FID) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.024746	0.0013
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(DR) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.915008	0.0001
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(CPI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.292215	0.0000
Test critical values:	1% level	-4.243644	
	5% level	-3.544284	
	10% level	-3.204699	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(TO) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.559978	0.0000
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(URB) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.243483	0.0098
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Unit root test at level and intercept (PP)

Null Hypothesis: LNLIFE has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		0.144480	0.9650
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LNNONLIFE has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		1.150936	0.9972
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: GDP_PERCAPITA has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		2.833479	1.0000
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	

	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: GDP_GROWTH has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.243892	0.0019
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: FID has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.143124	0.2298
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: DR has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.739842	0.8240
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: CPI has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.578539	0.0000
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	

	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: TO has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.316346	0.6117
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: URB has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.364336	0.1584
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Unit root test at 1st difference and intercept (PP)

Null Hypothesis: D(LNLIFE) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.102604	0.0002
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LNNONLIFE) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.512442	0.0000
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(GDP_PERCAPITA) has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.416659	0.0168
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(GDP_GROWTH) has a unit root
Exogenous: Constant
Bandwidth: 15 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-15.43665	0.0000
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(FID) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.916138	0.0003
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(DR) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*

Phillips-Perron test statistic		-5.824831	0.0000
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(CPI) has a unit root
Exogenous: Constant
Bandwidth: 23 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-25.79898	0.0001
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(TO) has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.533764	0.0000
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(URB) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.280683	0.0018
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.

Unit root test at level trend and intercept (PP)

Null Hypothesis: LNLIFE has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*

Phillips-Perron test statistic		-2.181697	0.4853
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LNNONLIFE has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.559551	0.7896
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: GDP_PERCAPITA has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.666142	0.9683
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: GDP_GROWTH has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 6 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.892525	0.0001
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: FID has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*

Phillips-Perron test statistic		-1.664337	0.7469
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: DR has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.227993	0.4609
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: CPI has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.787460	0.0002
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: TO has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.430428	0.8350
Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: URB has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.565315	0.2973

Test critical values:	1% level	-4.226815	
	5% level	-3.536601	
	10% level	-3.200320	

*MacKinnon (1996) one-sided p-values.

Unit root test at 1st difference trend and intercept (PP)

Null Hypothesis: D(LNLIFE) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.954870	0.0016
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LNNONLIFE) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.813057	0.0000
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(GDP_PERCAPITA) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.709901	0.0030
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(GDP_GROWTH) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 15 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*

Phillips-Perron test statistic		-15.09145	0.0000
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(FID) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.031924	0.0013
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(DR) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.915817	0.0001
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(CPI) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 24 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-24.54393	0.0000
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(TO) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*

Phillips-Perron test statistic		-7.514794	0.0000
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(URB) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.243483	0.0098
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Appendix D: model misspecification test (Ramsey RESET test)

Ramsey RESET Test
Equation: UNTITLED
Specification: LNLIFE LNLIFE(-1) GDP_PERCAPITA GDP_PERCAPITA(-1) GDP_PERCAPITA(-2) GDP_GROWTH GDP_GROWTH(-1) GDP_GROWTH(-2) FID DR DR(-1) CPI TO TO(-1) TO(-2) URB URB(-1) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.075668	18	0.9405
F-statistic	0.005726	(1, 18)	0.9405

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	2.01E-05	1	2.01E-05
Restricted SSR	0.063342	19	0.003334
Unrestricted SSR	0.063322	18	0.003518

Ramsey RESET Test
Equation: UNTITLED
Specification: LNNONLIFE LNNONLIFE(-1) LNLIFE GDP_PERCAPITA GDP_PERCAPITA(-1) GDP_GROWTH FID FID(-1) DR DR(-1) DR(-2) CPI CPI(-1) CPI(-2) TO TO(-1) TO(-2) URB URB(-1) URB(-2) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.175532	15	0.8630
F-statistic	0.030812	(1, 15)	0.8630

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	6.81E-05	1	6.81E-05
Restricted SSR	0.033214	16	0.002076
Unrestricted SSR	0.033146	15	0.002210

Appendix E: ARDL Long run and short run Regression results
Life insurance model long run regression output

ARDL Long Run Form and Bounds Test

Dependent Variable: D (LNLIFE)

Selected Model: ARDL (1, 2, 2, 0, 1, 0, 2, 1)

Case 2: Restricted Constant and No Trend

Date: 04/22/19   Time: 03:04

Sample: 1980 2017

Included observations: 36

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.344201	0.631177	-0.545332	0.5919
LNLIFE(-1)*	-0.373699	0.137026	-2.727210	0.0134
GDP_PERCAPITA(-1)	0.261563	0.125613	2.082285	0.0511
GDP_GROWTH(-1)	0.017028	0.005019	3.392455	0.0031
FID**	0.011840	0.004060	2.916076	0.0089
DR(-1)	0.004818	0.002980	1.616779	0.1224
CPI**	-0.005179	0.001534	-3.375107	0.0032
TO(-1)	0.011693	0.004154	2.815131	0.0111
URB(-1)	0.254447	0.075432	3.373212	0.0032
D(GDP_PERCAPITA)	1.258648	0.468418	2.687022	0.0146
D(GDP_PERCAPITA(-1))	-1.359968	0.411217	-3.307182	0.0037
D(GDP_GROWTH)	0.003689	0.002627	1.404276	0.1764
D(GDP_GROWTH(-1))	-0.005048	0.002556	-1.974611	0.0630
D(DR)	-0.010855	0.004157	-2.611267	0.0172
D(TO)	-0.003969	0.003089	-1.285053	0.2142
D(TO(-1))	-0.007363	0.004726	-1.557870	0.1358
D(URB)	0.479721	0.107749	4.452219	0.0003

* p-value incompatible with t-Bounds distribution.
** Variable interpreted as Z = Z(-1) + D(Z).

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP_PERCAPITA	0.699930	0.153608	4.556593	0.0002
GDP_GROWTH	0.045565	0.018941	2.405670	0.0265
FID	0.031683	0.009653	3.282200	0.0039
DR	0.012893	0.010455	1.233245	0.2325
CPI	-0.013858	0.006354	-2.180799	0.0420
TO	0.031290	0.011050	2.831660	0.0107
URB	0.680887	0.174096	3.910984	0.0009
C	-0.921066	1.897862	-0.485317	0.6330

EC = LNLIFE - (0.6999*GDP_PERCAPITA + 0.0456*GDP_GROWTH + 0.0317
*FID + 0.0129*DR -0.0139*CPI + 0.0313*TO + 0.6809*URB -0.9211)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.073802	10%	1.92	2.89
k	7	5%	2.17	3.21
		2.5%	2.43	3.51
		1%	2.73	3.9
			Finite Sample: n=40	
Actual Sample Size	36			
		10%	2.152	3.296
		5%	2.523	3.829
		1%	3.402	5.031
			Finite Sample: n=35	
		10%	2.196	3.37
		5%	2.597	3.907
		1%	3.599	5.23

Life insurance model short run regression output

ARDL Error Correction Regression
Dependent Variable: D(LNLIFE)
Selected Model: ARDL(1, 2, 2, 0, 1, 0, 2, 1)
Case 2: Restricted Constant and No Trend
Date: 04/22/19 Time: 03:14
Sample: 1980 2017
Included observations: 36

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP_PERCAPITA)	1.258648	0.213691	5.890031	0.0000
D(GDP_PERCAPITA(-1))	-1.359968	0.257352	-5.284476	0.0000
D(GDP_GROWTH)	0.003689	0.001159	3.184019	0.0049
D(GDP_GROWTH(-1))	-0.005048	0.001553	-3.250501	0.0042
D(DR)	-0.010855	0.002714	-3.999569	0.0008
D(TO)	-0.003969	0.002227	-1.782622	0.0906
D(TO(-1))	-0.007363	0.002623	-2.807304	0.0112
D(URB)	0.479721	0.064688	7.415883	0.0000
CointEq(-1)*	-0.373699	0.046390	-8.055511	0.0000

R-squared	0.770508	Mean dependent var	0.048583
Adjusted R-squared	0.702510	S.D. dependent var	0.088803
S.E. of regression	0.048435	Akaike info criterion	-3.004852
Sum squared resid	0.063342	Schwarz criterion	-2.608972
Log likelihood	63.08733	Hannan-Quinn criter.	-2.866679
Durbin-Watson stat	2.542062		

* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	5.073802	10%	1.92	2.89
k	7	5%	2.17	3.21
		2.5%	2.43	3.51
		1%	2.73	3.9

Non –life insurance model long run regression output

ARDL Long Run Form and Bounds Test
Dependent Variable: D(LNNONLIFE)
Selected Model: ARDL(1, 1, 0, 1, 2, 2, 2, 2)
Case 2: Restricted Constant and No Trend
Date: 04/22/19 Time: 03:16
Sample: 1980 2017
Included observations: 36

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.495195	0.858216	5.237835	0.0001
LNNONLIFE(-1)*	-0.984929	0.150515	-6.543716	0.0000
GDP_PERCAPITA(-1)	1.015504	0.151008	6.724848	0.0000
GDP_GROWTH**	-0.002080	0.002428	-0.856753	0.4035
FID(-1)	0.000842	0.002855	0.294748	0.7718
DR(-1)	0.001689	0.002306	0.732365	0.4739
CPI(-1)	-0.005053	0.002719	-1.858912	0.0804
TO(-1)	0.013962	0.003194	4.371179	0.0004
URB(-1)	0.115979	0.048555	2.388594	0.0288

D(GDP_PERCAPITA)	-0.054586	0.505181	-0.108053	0.9152
D(FID)	-0.010303	0.007198	-1.431501	0.1704
D(DR)	0.001323	0.003039	0.435306	0.6688
D(DR(-1))	-0.012641	0.002635	-4.797537	0.0002
D(CPI)	-0.001572	0.001507	-1.043403	0.3114
D(CPI(-1))	0.001642	0.000923	1.778785	0.0932
D(TO)	0.006238	0.003009	2.073046	0.0537
D(TO(-1))	-0.008621	0.004186	-2.059618	0.0551
D(URB)	0.078070	0.075670	1.031728	0.3167
D(URB(-1))	-0.059697	0.053174	-1.122659	0.2772

* p-value incompatible with t-Bounds distribution.
** Variable interpreted as Z = Z(-1) + D(Z).

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP_PERCAPITA	1.031043	0.045602	22.60936	0.0000
GDP_GROWTH	-0.002112	0.002375	-0.889282	0.3863
FID	0.000854	0.002857	0.299109	0.7685
DR	0.001714	0.002412	0.710737	0.4869
CPI	-0.005131	0.002534	-2.025048	0.0589
TO	0.014176	0.002672	5.305727	0.0001
URB	0.117754	0.045163	2.607317	0.0184
C	4.563980	0.411974	11.07831	0.0000

EC = LNNONLIFE - (1.0310*GDP_PERCAPITA -0.0021*GDP_GROWTH + 0.0009*FID + 0.0017*DR -0.0051*CPI + 0.0142*TO + 0.1178*URB + 4.5640)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	7.042933	10%	1.92	2.89
k	7	5%	2.17	3.21
		2.5%	2.43	3.51
		1%	2.73	3.9
			Finite Sample:	
Actual Sample Size	36		n=40	
		10%	2.152	3.296
		5%	2.523	3.829
		1%	3.402	5.031
			Finite Sample: n=35	
		10%	2.196	3.37
		5%	2.597	3.907
		1%	3.599	5.23

Non-life insurance model short run regression output

ARDL Error Correction Regression
Dependent Variable: D(LNNONLIFE)
Selected Model: ARDL(1, 1, 0, 1, 2, 2, 2, 2)
Case 2: Restricted Constant and No Trend
Date: 04/22/19 Time: 03:18
Sample: 1980 2017
Included observations: 36

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP_PERCAPITA)	-0.054586	0.141354	-0.386169	0.7042
D(FID)	-0.010303	0.003450	-2.986263	0.0083
D(DR)	0.001323	0.001962	0.674052	0.5093
D(DR(-1))	-0.012641	0.001942	-6.510337	0.0000
D(CPI)	-0.001572	0.000452	-3.477046	0.0029
D(CPI(-1))	0.001642	0.000521	3.149348	0.0059
D(TO)	0.006238	0.001819	3.429642	0.0032
D(TO(-1))	-0.008621	0.002207	-3.906852	0.0011
D(URB)	0.078070	0.037496	2.082076	0.0528
D(URB(-1))	-0.059697	0.036343	-1.642599	0.1188
CointEq(-1)*	-0.984929	0.102014	-9.654806	0.0000

R-squared	0.870170	Mean dependent var	0.052630
Adjusted R-squared	0.818238	S.D. dependent var	0.085985
S.E. of regression	0.036658	Akaike info criterion	-3.527889
Sum squared resid	0.033596	Schwarz criterion	-3.044036
Log likelihood	74.50200	Hannan-Quinn criter.	-3.359011
Durbin-Watson stat	2.171935		

* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	7.042933	10%	1.92	2.89
k	7	5%	2.17	3.21
		2.5%	2.43	3.51
		1%	2.73	3.9

Appendix F :correlatio matrix

Correlation matrix									
	LP	NLP	I	FID	GDP	DR	CPI	TO	URB
NLP	1	0.973055	0.988023	0.390449	0.514949	-0.78917	0.214155	0.673078	-0.12473
LP	0.973055	1	0.972066	0.357327	0.507025	-0.75105	0.296054	0.663724	-0.04742
I	0.988023	0.972066	1	0.310234	0.498132	-0.76851	0.242932	0.610352	-0.06274
FID	0.390449	0.357327	0.310234	1	0.155538	-0.35741	0.016727	0.608114	-0.41213
GDP	0.514949	0.507025	0.498132	0.155538	1	-0.4022	-0.1346	0.511681	-0.20237
DR	-0.78917	-0.75105	-0.76851	-0.35741	-0.4022	1	-0.02092	-0.56385	0.354512
CPI	0.214155	0.296054	0.242932	0.016727	-0.1346	-0.02092	1	0.110851	0.240778
TO	0.673078	0.663724	0.610352	0.608114	0.511681	-0.56385	0.110851	1	-0.51562
URB	-0.12473	-0.04742	-0.06274	-0.41213	-0.20237	0.354512	0.240778	-0.51562	1