DETERMINANTS OF LIFE INSURANCE DEMAND IN ETHIOPIA

A Thesis Submitted To Department Of Accounting& Finance in Partial Fulfillment of the Requirements for the Degree of Master of Science in Accounting and Finance

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Declaration

I, Tigest Deresse, hereby declare that the thesis work entitled “Determinants of Life Insurance Demand in Ethiopia” Submitted by me for the award of the Degree of Master of Science in Accounting and Finance of Addis Ababa University at Addis Ababa Ethiopia, is my original work and all sources of the material used for this project work have been properly acknowledge.

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ENDORSEMENT

This thesis has been submitted to Addis Ababa University College of Business and Economics, for examination with my approval of a University advisor.

Dr.Sewale Abate _____

Advisor **Signature & Date**

Certification

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This is to certify that the thesis prepared by Tigest Deresse entitles: **Determinants of Life Insurance Demand in Ethiopia** and submitted in partial fulfillment of the requirements for the Degree of Masters of Science in Accounting and Finance compiles with the regulations of the university and meets the accepted standards with respect to originality and quality. Signed by examining committee:

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ACRONYMS

CSA: Central Statistics Agency

EDU: Level of Education

FDT: Financial Deepening

GDP: Gross Domestic Product

INC: Income

INF: Inflation

LEP: Life Expectancy

M2: Money Supply

MoFEC: Ministry of Finance and Economic Cooperation

NBE: National Bank of Ethiopia

OLS: Ordinary Least Squares

PLI: Premium of Life Insurance

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ABSTRACT

One of the ways of protection a family in case of hardships in life, life insurance is a very important and necessary protection. Among the different problem people face in life are; the breadwinner dies or is disabled and cannot generate income. It also uses for saving purpose and it pays the sum assured in case of maturity the insured can take loans from the saved amount. Although the performance of the insurance industry is closely linked to economic conditions, the life insurance business has been experienced low level of development in Ethiopia. This study's aimed to investigate determinants of life insurance demand in Ethiopia. Ordinary Least Squares (OLS) regression was used to examine the effect of level of income, premium of life insurance, life expectancy, education, financial deepening and inflation on life insurance demand in Ethiopia over a period of 30 years from 1987/1988 to 2016/2017. The collected secondary data were analyzed with multiple regression analysis by using Eviews8. In this study correlation analysis was carried out to show the direction of relationships among the dimensions included in the model. Moreover, regression analysis was conducted to determine the predictive values of the variables. The findings revealed that life expectancy has statistically noticeable negative effect on the life insurance demand in Ethiopia. In addition to that, results shows that the education, per capita income and financial deepening have statistically significant positive influence on life insurance demand in Ethiopia. The other findings discovered that premium of life insurance and inflation has insignificant impact on life insurance demand in Ethiopia for the study period. Based on this finding, the researcher recommended that the government tries to give much emphasis in increasing real income of the people, insurance education for tertiary levels by life insurance companies and national bank of Ethiopia give training for domestic actuaries to support life insurance industry.

Keywords: - Life Insurance, Financial Deepening and Ethiopia

CHAPTER ONE
1. INTRODUCTION

This chapter presents about background of the study, statement of the problem, research objectives and hypothesis, significant of the study, scope of the study and limitation of the study. Finally the organization of this thesis also presented.

1.1 Background of the Study

Life insurance is a risk-pooling plan, an economic device through which the risk of premature death is transferred from the individual to the group. However, the contingency insured against has certain characteristics that make it unique; as a result, the contract insuring against the contingency is different in many respects from other types of insurance. The event insured against is an eventual certainty. No one lives forever. Yet life insurance does not violate the requirements of an insurable risk, for it is not the possibility of death itself that is insured but rather, untimely death. The risk in life insurance is not whether the individual is going to die but when, and the risk increases from year to year. The chance of loss under a life insurance contract is greater in the second year of the contract, as far as the company is concerned, than it was in the first year, and so on, until the insured eventually dies.(Vaughan & Therese , 2008)

Life insurance is a very important and necessary way of protecting a family in case the bread winner dies or is disabled and cannot generate income. It also used for saving purpose and it pays the sum assured in case of maturity the insured can take loans from the saved amount.

The fundamental purpose of insurance, whether of people or of property, is protection against possible economic loss, economic loss being simply defined as the unintentional and permanent loss of something which has monetary value. Insurance is a complicated and intricate mechanism, and it is consequently difficult to define. However, in its simplest aspect, it has two fundamental characteristics: 1) Transferring or shifting risk from one individual to a group and 2) Sharing losses, on some equitable basis, by all members of the group when we came to life insurance definition.

"From an individual point of view, insurance is an economic device whereby the individual substitutes a small certain cost (the premium) for a large uncertain financial loss (the contingency insured against that would exist if it were not for the insurance". And " From the social point of view, insurance is an economic device for reducing and eliminating risk though the process of combining a sufficient number of homogeneous exposures into a group to make the losses predictable for the group as a whole". (Teklegiorgis, 2004, pp.166 -168)

Life insurance plays an important role in an individual's personal financial plan, as suggested by most personal finance and financial planning books. Life insurance helps individuals save money while protecting against personal risks in life. However, financial planners and representatives of life insurance companies would attest that many individuals are often reluctant to allocate funds in life insurance and fail to see its underlying benefits as a personal risk management tool. (Mahdzan & Sarah, 2013)

According to (Alhassan & Nicholas , 2015) 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. The nature of the life insurance market makes it a better financial intermediary by serving as income replacement in the event of the death of a breadwinner as well as savings instrument for consumers. Most importantly, the long-tail nature of life insurance policies ensures that funds mobilized from life insurance consumption are made available for financial agents through intermediation activities of the financial agents and markets. This function makes life insurance an alternative source of internal fund mobilization for the emerging economies like African which have traditionally been heavily dependent of foreign grants and loans for budgetary support.

Life Insurance plays an important role to insure against lifetime uncertainty resulting for the mortality risk of individual. Although the performance of the insurance industry is closely linked to economic conditions and important for internal fund mobilization for the emerging economy like our country Ethiopia this study helps to increase the life insurance industry by point out on the main determinants of life insurance demand.

The global and domestic economy and insurance industry

According to UNECA Economic Report on Africa (2017), global economic growth tapered from 2.5% in 2015 to 2.3 % in 2016, reflecting a slight decline in gross fixed capital formation (investment) growth and in households' final consumption growth. Growth slipped a little in the united states (from 2.4% in 2015 to 2.2% in 2016), and it remained unchanged in the euro area, which was 1.7%, and China's economic growth decelerated from 6.9% to 6.4 %.

Economic growth in Africa also fell by more than half from 3.7% in 2015 to 1.7% in 2016 amid weak global economic conditions resulted from still-low (even if rising) oil and commodity prices and adverse weather conditions. In 2016 East African growth was the fastest on the continent and was driven by the growth of Ethiopia, Kenya, Rwanda and Tanzania. The main contributor to the Ethiopian growth was public spending on infrastructure.

According to the national bank of Ethiopia Annual Report, the Ethiopian Economy which had exhibited 9.8% average annual growth during the fiscal years 2010/11 -2015/16 registered 8% growth in 2015/16 despite challenging macroeconomic and adverse weather conditions. The 8% real GDP growth was 3.2% point lower than base case scenario of GTP-II target set for the fiscal year although it was significantly higher than 1.6% average growth estimated for Sub-Saharan Africa.

The growth in real GDP was mainly attributed to 8.7% growth in services, 2.3% in agriculture and 20.6% in industrial sector the share of agriculture in GDP in 2015/16 went down to 36.7% from 38.7% a year earlier, lower than GTP-II target of 37.5% for the fiscal year, which is a positive development. Industrial sector showed a 20.6% annual growth and accounted for 16.7% of the GDP. The sector contributed 38.8% to the overall economic growth during the fiscal year, and its performance was more or less in line with GTP-II target of 21.8% growth and 16.6% share.

In general, the development activities planned a performed in GTP-II in the economic and social sectors are believed to directly or indirectly offer a good deal of business

opportunity to the Ethiopian insurance sector though the question of equal playing field has remained unanswered.

Currently, the number of insurance companies remained at 17, consisting of 16 private and 1 public. Total insurance branches increase to 482 from 465 a year earlier. Of the total branches, about 53.9% were in Addis Ababa. The total capital of insurance companies reached birr 3.9 Billion, of which private insurance companies accounted for 75%.

According to the information from National Bank of Ethiopia, during the 2016/17 budget year, the industry's gross written premium reached at birr 7.5 billion of this premium birr 0.4 billion or 4.8% generated from life sector while birr 7.1 billion (95.2%) accounted for the general insurance business. Against the previous year same period, this year's gross written premium for general and life businesses showed a 17.2% and 8.1% growth rate, respectively.

Generally, the Ethiopian insurance industry has continued to be challenged by intensified, unhealthy price cutting competition, increase in claims cost due to rise in spare parts cost, shortage of skilled manpower, low awareness among the public of the importance of insurance and the problem of properly heeding to one of the basic principles of insurance, utmost good faith and lack of product differentiation.

Ethiopian life insurance history

The insurance business in Ethiopia in its modern application is a recent phenomenon, a branch of a foreign insurance company known as "Baloise Fire Insurance Company" was opened by an Austrian (Weinsinger) in Addis Ababa In 1923. For the first time in Ethiopia the company paid compensation to a client in 1929 for damage to his store caused by fire. Beginning from this time until the Italian invasion of 1936 some foreign insurance companies were operating through their agents. During the Italian occupation of Ethiopia in 1936 -1941, Italian insurance companies operated and non-Italian companies were closed down. (Teklegiorgis, 2004, pp.166 -168)

A survey was undertaken by the Ministry of Trade and Industry in 1954 to find out the situation of the insurance industry and to indicate ways ho the industry could develop. The survey revealed that there were 19 insurance companies operating in Ethiopia of which there was only one domestic company, Imperial Insurance Company, established in 1951. The companies had agents import towns and commercial centers, namely Addis Ababa, Asmara, Assab, Dessie, Dire Dawa and Massawa. A second survey on insurance companies was undertaken by the Ministry of Trade and Industry in 1960. The survey revealed that the number of insurance companies operating in the country increased to 33.

In this survey also, Imperial Insurance Company was the only domestic insurer. Due to some malpractices on insurers and complaints on the insurance industry the Addis Ababa Chamber of Commerce conducted a survey in 1967. The survey revealed that there were 30 foreign companies operating either through branches or agents and 10 domestic companies in the insurance business. The Chamber of Commerce in its report recommended that a detailed legislation to control the practice of insurance business be enacted.

In order to direct and control the insurance business, a law (Proclamation No. 281/1970) was passed, prior to this law the Commercial Code of Ethiopia of 1960, articles 654 – 712 tried to define the insurance contracts and the rights and duties of the contracting parties. Proclamation no. 281/1970 gave the responsibility of controlling the insurance business to the Ministry of Trade and Industry.

Based on the provisions of the proclamation a council was established chaired by the Minster of the Ministry of Trade and Industry and consisting the following as members: Ministry of Finance, Minister of the Ministry of Communications, Head of the Planning Commission, Minister of the Ministry of Social Affairs and Environmental Development, and Governor of the National Bank of Ethiopia. The main objective of this council was to encourage and control the insurance business and to formulate policies that enhance insurance and investment. Under the council the Office of the Controller of Insurance was established. This office licensed 15 domestic insurance companies, 36 agents, 7 brokers, 11 loss assessors, and 3 actuaries.

In 1974 the military government came to power and nationalized all the 13 insurance companies that were operating in the country. The boards of all the nationalized companies were dissolved and a new Provisional Insurance Board was set up. The nationalized companies were operating independently but all were required to report to the Provisional Insurance Board. The Ethiopian Insurance Corporation was established under proclamation no. 68/1975 with a paid up capital of 11 million dollars, the assets, liabilities, rights and obligations of the nationalized private insurance companies were transferred to the Ethiopian Insurance Corporation. (Teklegiorgis, 2004, pp.166 -168)

The Ethiopian Insurance Corporation operated as a sole insurance organization until 1994. Following the change of government in 1991 a new economic policy that increased the role of the private sector in the economy was formulated. A new and comprehensive law to regulate the licensing operation and supervision of insurance business was promulgated by the Transitional Governments of Ethiopia under proclamation No.86/1994. Under this legislation the task of the licensing and supervision of insurance business was given to the National Bank of Ethiopia. (Teklegiorgis, 2004, pp.166 -168)

Ethiopian insurance industry has passed through different economic stages in its history. During the Imperial era (1914 up to 1974), life insurance growth declined at a declining rate from 15.1 percent to 7.9 percent and the average percentage of life insurance premium to the total gross written premiums during the years 1979/80 – 1993/94 was 4.5 percent. A similar trend continued after 1994. For example, during the period 2000/01 – 2004/05 the gross written premiums of the long-term insurance industry (dominated by life insurance policies) was fluctuating within the range of 4 percent to 5 percent (Zeleke, 2007).

As per Roman (2011) in Ethiopia, the insurance market is undeveloped, uncompetitive and there exist lack of information on the kind of life insurance that is currently present. The current practice of bulk of insurance coverage and business in Ethiopia is target the corporate market and focuses mainly on general insurance with a very limited coverage in life insurance. The life insurance sector is small in many developing countries, due to the fact existence life insurance may additionally be viewed beside the point then in

appropriate because ideological, cultural, and religious reasons, then because economic security is supplied by the family.

Table 1.1: The Share of Life Insurance Premium to the Insurance Industry

Development of gross premuim in Ethiopia from 2005 to 2016							
Years	Non life in ETB	Life in ETB	Total in ETB	% Growth in Non - life insurance	% Growth in Life insurance	% Growth in Total	Share of life insurance Premium to the Total Premium in %
2016	6,148,457,280.00	322,609,009.00	6,471,068,305.00			-	5%
2015	5,269,455,252.00	281,954,299.00	5,551,411,566.00	17%	14%	17%	5%
2014	4,694,201,255.31	277,830,182.38	4,972,031,437.69	12%	1%	12%	6%
2013	4,521,806,555.32	299,882,135.63	4,821,688,690.95	4%	-7%	3%	6%
2012	3,734,578,246.93	255,895,872.00	3,990,474,118.93	21%	17%	21%	6%
2011	2,432,919,797.08	160,303,821.44	2,593,223,618.52	54%	60%	54%	6%
2010	1,830,262,195.96	110,293,217.33	1,940,555,413.29	33%	45%	34%	6%
2009	1,375,996,485.19	91,797,963.87	1,467,794,449.06	33%	20%	32%	6%
2008	1,188,664,628.64	74,112,459.21	1,262,777,087.85	16%	24%	16%	6%
2007	972,188,754.26	52,181,897.00	1,024,370,651.26	22%	42%	23%	5%
2006	787,674,683.32	39,627,164.00	827,301,847.32	23%	32%	24%	5%
2005	641,532,031.09	32,082,275.00	673,614,306.09	23%	24%	23%	5%
Avarage	2,799,811,430	166,547,525	2,966,359,291	23%	25%	22%	6%

Source: National Bank of Ethiopia (2017) premium and earnings of insurance industry

The above table 1.1 shows the total gross written premium trend from insurance business from 2005 to 2016 according to the above table life insurance gross written premium in 2016 is 322,609,009.00 and it has a 14% growth from year 2015 which was 281,954,299. Even if life insurance business growth premium growing but the share of life insurance business is remain 5% and it has been experienced low level of development in Ethiopia.

Despite the fact that the number of insurance companies gradually increasing and also the efforts made by the insurance companies, the demand for life insurance is very low. Thus, this study seeks to find out and analyze those factors that contribute behind the low demand for life insurance in Ethiopia.

1.2 Statement of the problem

A key decision the individuals or families take is whether to buy life insurance or not. The reason behind considering such a decision is to protect against possible loss of income. Life insurance provides individuals and the economy as a whole with a number

of important financial services. In the face of escalating urbanization, mobility of the population, and formalization of economic relationships between individuals, families, and communities, life insurance has taken increasing significance as a way for individuals and families to manage income risk. Also, life insurance products encourage long-term savings and the re-investment of substantial sums in private and public sector projects. (Sarkodie & Hadrat, 2015)

Ethiopia is one of the developing country in Africa and almost all African country including Ethiopia have insurance companies in there city those insurance company have a role for each country for their economy as a whole. Currently in Ethiopia about 17 insurance companies are available from them only 10 Namely; Ethiopian Insurance Corporation(EIC), Africa insurance company S.C, Niyala insurance company S.C, Awash Insurance Company, United Insurance Company S.C (UNIC), Naile Insurance Company S.C, Nib Insurance Company S.C, Oromiya Insurance company S.C, Ethio Life and General Company and Abay Insurance Company S.C. Insurance companies sell life insurance products but those 10 insurance companies are not contributing a huge amount for the economy because of life insurance market in our country not satisfactory for different reasons.

(Yared Mola, 2015) the share of the life insurance business in Kenya has risen about 36.2% whereas Ethiopia's is limited to 5.5%. This implies that the life insurance business is, despite lucrative opportunities like the growing middle class, playing a less important role in the national economy. Maximizing the share of life insurance business in Ethiopia is vital for our economy so need to find out the factor that in our country the life insurance market is not satisfactory.

Even though the numbers of companies that transact life insurance business are increasing, the demand for life insurance remains extremely low. Thus this study seeks to find out why life insurance demand is very low by using some identified factors.

To the best of the researcher‘s knowledge, there are only four previous research works in Ethiopia concerning the demand for life insurance. The first project is conducted by Roman (2011) she makes her major concern on only general economic factors that

determine life insurance demand. Since there are also demographic and institutional determinants that must be explored, this study would fill this gap by studying the remaining variables. The second research is conducted by Aderaw (2013) examined the determinants of life insurance for a time series data for the period 1991-2010. His work focus on the relationship of life insurance and on only some selected independent variables (income, real interest rate, dependency ratios and life expectancy for males). The third research conducted by Amrot (2014) in the title on "Determinants of Life Insurance Demand in Ethiopia" her work focused on only some selected independent variables (income, inflation, real interest rate, level of education, life expectancy and dependency ratio) and the forth researcher Luqman et.al.., (2015) conducted on the title of "Investigation the factors influencing the life insurance market in Ethiopia". The current study is different from the study of Luqman et.al.., (2015) in the following aspects: the impact of the two basic macro level variables examined in this study financial deepening & level of education is not studied by Luqman et.al.., (2015); and the periods covered in this study are from 1988 - 2017 but the study of Luqman et.al.., (2015) covered the period 1979-2007.

This study proceeds to examine the macroeconomic and demographic factors affecting the demand for life insurance. Generally, this research work would fill existing gap of previous studies by including new variable financial deepening and by using more recent data.

1.3 Objectives of the study

The general objective of the study is to investigate determinants of life insurance demand in Ethiopia.

The specific objectives of the study were to achieve the following;

- To measures the effect of national income on demand for life insurance.
- To find out the effect of inflation on demand for life insurance.
- To detect the effect of premium of insurance on demand for life insurance.
- To determine the effect of life expectancy on demand for life insurance.
- To identify the effect of financial deepening on demand for life insurance.

- To detect the effect of level of education on demand for life insurance.

1.4 Hypothesis of the Study

In this study these variables were studied empirically and the effect of these variables on life insurance demand.

H_1: The level of income has positive and significant effect on demand for life insurance.

H_2: Inflation has negative and significant effect on demand for life insurance.

H_3: Level of education has positive and significant effect on demand for life insurance.

H_4: Life expectance has negative and significant effect on demand for life insurance.

H_5: Premium of insurance has negative and significant effect on demand for life insurance.

H_6: Financial deepening has positive and significant effect on demand for life insurance.

1.5 Significant of the Study

This research paper useful for the following angles:-

- For national bank of Ethiopia since this study analyzes the effect of macro level factors at national level, the findings of the study would help to influence some policies at national level.
- For managements of insurance company to give clue to maximize the number of insured person by working through on those findings that determine life insurance demand.
- And also for future researcher those are interested to study in this area as a reference.

1.6 Scope of the Study

To find out the main determinants of life insurance demand in Ethiopia the researcher studied on macro level determinants of life insurance demand in Ethiopia based on six variables (premium of life insurance, income, life expectancy, financial deepening,

inflation and level of education) so that the finding of this research based on the those variables for the policy maker and any other body want to infer this thesis should notice this. In addition to the study used time series secondary data from1988 up to 2017 G.C (30 years). The researcher used life insurance industry as target population.

1.7 Limitation of the Study

The research used secondary source of data to determined life insurance demand in Ethiopia. But in applicability of important proxies in similar other studies that were conducted in other countries, due to unavailability of data, limit the study to focus on few applicable variables only.

1.8 Organization of the study

This thesis consisted of five chapters. Following the above introduction, chapter two provides a review of theoretical, empirical literature related to demand of life insurance and conceptual frame work. The research design, population and sampling techniques, types of data and tools, method of data analysis, diagnostic test of method, validity and reliability and model specification with variable description are discussed in the third chapter. Chapter four discussed the results of the empirical analysis in relation to testing the hypothesis and chapter five presents summary of major findings, conclusion and recommendation.

CHAPTER TWO
2 LITERATURE REVIEW

The objective of this chapter is reviewing the literature first presents the theoretical research and highlight the most relevant findings in the field of life insurance demand. Then the researcher proceeds to the empirical studies which for the most part evaluate factors' impact on life insurance demand in particular countries and across them finally, with the conceptual frame work end**.**

2.1 Theoretical Literature

Introduction to Life insurance Products: we all recognize that, unlike the value of property, the value of a human being cannot be measured in terms of money. But as far as insurance is concerned, the economic value of a person is basically represented by his income. The total or partial, temporary or permanent loss of this income represents an economic loss to all those who are dependent on that income for their livelihood.

A human life has economic value to all who depend on the earning capacity of that life, particularly to two central economic groups-the family and the employer. To the family, the economic value of a human life is probably most easily measured by the value of the earning capacity of each of its members. To the employer, the economic value of a human life is measured by the contributions of an employee to the success of the business firm. If one argues that in a free competitive society a worker is paid according to worth and is not exploited, the worker's contribution again is best measured by earning capacity. It develops that earning capacity is probably the only feasible method of giving measurable economic value to human life. (Teklegiorgis, 2004, pp. 133 - 142)

There are four main perils that can destroy, wholly or partially, the economic value of a human life. These include premature death, loss of health, old age and unemployment. [1] Life insurance can be used to alleviate the financial consequences of premature death. The purchase of life insurance is economically justified if the insured earns an income,

[1]Permanent death can be defined as the death of a family head with outstanding unfulfilled financial obligations, such as dependents to support, children to educate, a mortgage to be paid off, and other installment debts.

and others are dependent on that earning capacity for at least part of their financial support. If the breadwinner dies prematurely, life insurance can be used to restore the family's share of the deceased breadwinner's earnings. (Teklegiorgis, 2004, pp. 133 - 142)

It should be noted that a life insurance policy is a valued policy that pays a stated sum to a named beneficiary and it not a contract of indemnity. The insured event is the uncertainty of the time of death, we must all die, but the time of death is uncertain. For many people, the risk management tool that is most appropriate for dealing with the exposure of premature death is life insurance. There are many different types of life insurance, but the standard arrangement is a contract specifying that upon the death of the person whose life is insured, a stated sum of money (the policy's face amount) is paid to the person designated in the policy as the beneficiary.

Major types of life insurance contracts:- There are four basic classes of life insurance contracts: 1) term, 2) whole-life, 3) endowment, and 4) annuities.

Term Insurance: a term policy in life insurance may be defined as a contract that furnishes life insurance protection for a limited number of years, the face value of the policy being payable only if death occurs during the stipulated term, and nothing being paid in case of survival. Term insurance provides temporary protection, it is called term because the coverage is for a limited term. Common types of term life insurance are 1 year term, 5 year term, 10 year term, 20 year term, and term of age 60 or 65. Term insurance protects the beneficiary if the insured dies within the term specified in the policy, if the insured lives to the end of the term, the policy expires and no payment is made by the insurer. Term life insurance is similar to property insurance in this respect. If there is no loss to a home or automobile while a policy is in force, the insurer makes no payment. This is also the case with term life insurance. (Teklegiorgis, 2004, pp. 133 - 142)

Whole life insurance: it provides for the payment of the face value upon the death of the insured, regardless of when it may occur. Whole life insurance policies promise to pay the beneficiary whenever death occurs. Whole life polices also promise payment if the

insured reaches age 100. Cash values Whole life insurance contracts contain savings element called cash values. The cash values are due to the overpayment of insurance premiums during the early years. As a result, the policy owner builds cash equity in the policy. If the owner of a whole life policy decides to terminate it prior to the insured's death, then the cash value can be refunded, this is in contrast to term insurance, where discontinued policies simply cease to provide coverage without any type of refund for the policy owner.5 the cash value are relatively small during the early years, but increase over time. For example, in a whole life policy, a Birr 50,000 policy issued at age 20 may have Birr 25,000 of cash value at age 65. (Teklegiorgis, 2004, pp. 133 - 142)

Endowment Insurance: an endowment policy pays the face amount of insurance if the insured dies within a specified period: if the insured survives to the end of the endowment period, the face amount is paid to the policy owner at that time. Endowment contract provided death benefits for a specified period of time, just as term insurance does, however, unlike term insurance, endowment insurance has a cash value, and the policy owner is paid the contracts face amount at the end of the protection period if the insured is still alive. Endowment insurance may be a useful way for some persons to accumulate a specified sum over a sated period of time whether they live or die. The objective may be to pay living expenses during retirement, or to retire a debt. (Teklegiorgis, 2004, pp. 133 - 142)

Annuities: an annuity can be defined as a periodic payment to an individual that continues for a fixed period or for the duration of a designated life or lives. The person who receives the periodic payments or whose life governs the duration of payment is known as the annuitant. In one sense, an annuity may be described as the opposite of life insurance. Life insurance creates an immediate estate and provides protection against dying too soon before financial assets can be accumulated. The fundamental purpose of a life annuity is to provide a lifetime income that cannot be outlived to an individual. An annuity is designed to liquidate a principal sum and provides protection against the loss of income because of excessive longevity and the exhaustion of one's savings. (Teklegiorgis, 2004, pp. 133 - 142)

Principles of insurance

According to the Ethiopian Commercial Code, a code governing Insurance policies, an Insurance policy is "a contract whereby a person called the insurer, undertakes against payment of one or more premium to pay to person, called the beneficiary, a sum of money where a specified risk materializes. Among the fundamental principles of insurance, The Principles of Insurable Interest, Indemnity, Utmost Good Faith and Proximate Cause are the fundamental ones.

The Principle of Utmost Good Faith

A person who applies for insurance is usually given an application form containing questions about the nature of risk. If the applicant wants insurance on property, the form will call information as to the age, the use description and condition of the property, as well as its location and value or cost. An application for life insurance calls for such facts as to the age, occupation and habits of the applicant, any prior illness or accidents, and the health of the applicant's parents. The insurer decides to accept or not to accept the application (offer) based on the information given. The insurer decides to accept or not to accept the application (offer) based on the information giving all necessary information to the insurer. The beneficiary (the insured) must give any information within his knowledge to the insurer. In other words, the beneficiary must disclose (reveal) all relevant facts about the thing or life to be insured. Relevant facts means, facts that may help (assist) the insurer to determine the amount of premium to be charged. The information given must be true. Failure to disclose such facts is fraud. So there must be utmost good faith regarding insurance contract.

The Principle of Insurable Interest some data were not get

According to the commercial code of Ethiopia, any interested person, in the preservation of an object may insure it. A person who buys insurance policy must have an insurable interest in the property or in the life insured. An insurable interest is the financial interest or financial stake that a person has in the property or in the life of another or his health. Any person who would suffer a direct financial lose if certain property were damaged or

destroyed has an insurable interest in such property. Such a person need not be the owner but may be someone who has a security interest. In property insurance, there some common classes of circumstances that give rise to insurable interest. They are ownership and other rights in property, contract rights, and potential legal liability to others. Every person has insurable interest in his or her own life. A person may have an insurable interest in the life of another, if their relationship is such that an economic benefit can be expected from the continued life of another. An agreement without insurable interest is invalid because a person who has nothing to lose and everything to gain might be tempted to cause the destruction of the insured property or the death of the insured person so that the policy holder would be entitled to the proceeds of the insurance.

The Principle of Indemnity

In the commercial code of Ethiopia, it is stated that contract for the insurance of an object is a contract for compensation. The compensation shall not exceed the value of the object insured on the day of the occurrence. The principle of indemnity/compensation is based on the idea that insurance is a system for distributing loss. It is not a mechanism of generating profit. Therefore, in the event of causality, an insured be limited to reimbursement (indemnity) for loss actually suffered. You may not be compensated above the loss. The value of property may be assessed on the day the policy is bought and on the day loss occurs. But the human life cannot be expressed in terms of money. Accordingly, the principle of indemnity does not apply to life insurance policy. The amount inured may be fixed freely and shall be due regardless of the damage suffered by the insured person.

The Principle of Proximate Cause

The doctrine of proximate cause is based on the principle of cause and effect, which states that having proved the effect and traced the cause, it is not necessary to go further. In other words the law doesn't concern itself with the cause of causes. The law provides the rule -"causa proxima nonremota spectator". It means we should regard only the immediate cause not the remote or distant cause.

So the concept summarize into the following details. The insured peril need not be the initial cause but it must be a direct result of the operation of an excepted peril (unless the policy wording specifically overrules this).

According to this insurance policy Damage as the direct result of an insured peril is covered even though the immediate peril causing that damage is not mentioned in the policy (unless the policy specifically excludes the result); thus water or smoke damage after fire are covered. Property can be covered even though the named peril does not actually cause damage to the insured property, so long as the named peril does not operate and its results cause loss to the insure. For example, if the building next door to the insure catches fire and the only damage the insured suffers is by water or smoke, his fire policy will operate (provided the original fire was not caused by a peril named as excluded in the insured's policy). Further damage to attempts to minimize a loss already taking place, is covered. Therefore, water damage from sprinklers or firemen's hose is covered.

The demand for life insurance

Theoretical underpinnings on life insurance demand date back to the 1960s with works by Yaari (1965) in which theoretical frame works for life insurance demand were developed. In Yaari's framework the demand for life insurance is attributed to a person's desire (or a "joy of giving") to bequeath funds to dependents and provide income for retirement. It was posited that the demand for life insurance is a function of wealth, expected income over a person's lifetime, interest rates, the cost of life insurance policies (e.g. administrative costs) and the assumed subjective discount on current over future consumption.

Simple models of insurance demand were proposed by (Mossin, 1968) considering a risk-averse decision maker endowed with an initial wealth level. The results indicate that demand for life insurance varies inversely with the amount of wealth an individual possesses. Hakansson (1969) examined bequest motive in sonsiderable detail using a discrete-time model of demand for financial assets in general and life insurance purchase in particular. Pissarides (1980) extended yaari's work to prove that life insurance was

theoretically capable of absorbing all fluctuations in life time income. (Karni, 1985) developed a methodology towards measuring individuals' risk protections (risk averse or otherwise) and how such perceptions affect insurance demand. An important observation make by (Mossin, 1968) was regarding insurance coverage as an inferior good. However, (Briys. 1989) generalized the results showing insurance to be a 'Giffen'good.

Lewis (1989) extend Yaari's model in a way that leads to direct empirical applications. His approach was distinctive in that the demand for life insurance was viewed from the perspective of the beneficiaries: life insurance is chosen to maximize the beneficiaries' expected lifetime utility. Results of his model were intuitively appealing in that they simulate the explicit calculation households make when they buy life insurance.(Kjosevski, 2012)

(Madura, 2010) on his book on financial markets and institutions sated that life insurance companies compensate the beneficiary of a policy up on the policyholder's death. They charge policyholders a premium that should reflect the probability of making a payment to the beneficiary as well as the size and timing of the payment. Life insurance companies also commonly offer employees of a corporation a group life policy.

Almost all theoretical work at the demand for life insurance takes Yaari(1965) as a starting point. He mentioned that the demand for life insurance is all taken into consideration in the context of the consumers' lifetime allocation method. It's far assumed right here that each utility – maximization household has the same degree of relative risk aversion, although some evidence indicates that inter – country difference are probably to reflect variations inside the degree of relative risk aversion and therefore after the demand for life insurance.

2.2 Review of the Empirical Literature

a) International Evidence

Kakar and Shukla(2010) on their research on determinants of demand for life insurance in an emerging economy -India using logistic regression has confirmed that insured households tend to be more prosperous, more educated and more optimistic about future

security than non-insured households. In both rural and urban areas, product ownership is a major determinant of insurance buying, and income has only a marginal impact on life insurance participation. Both the level of education and occupation of the chief earner of a household are major determinants of life insurance participation, apart from asset-ownership. Further, households that are more optimistic about the adequacy of future income and savings show higher levels of participation. And inflation is no impact.

Wang (2010) a study on factors influence consumers life insurance purchase decision in CHINA by using survey data cluster suggest that Results indicated that a number of variables helped explain Chinese consumers' ownership of life insurance. These included knowledge of life insurance, proportion invested in life insurance, buying preference from foreign firms, importance of death benefit and low premium, gender, and family monthly income. The importance of product attributes is the most important factor affecting Chinese consumers' ownership of life insurance.

Kjosevski (2012) a study on the determinants of life insurance demand in central and south Easter Europe by using regression output the result indicates that The higher GDP/capital, inflation, health expenditure, level of education and rule of law are the most robust(strong) predictor of the use of life insurance but real interest rate, ratio of quasi money , young dependency ratio, old dependency ratio, corruption and gov't effective do not appears to be robustly associated with life insurance.

Mahdzan& Victorian (2013) a study on the determinants of life insurance demand: a focus on saving motives and financial literacy using descriptive, one way ANOVA and multiple regression and the result implies that Saving motive and socio demographic positive impact but financial literacy do not affect.

Elisa et al.,2015 a study on life insurance demand evidence from Italian households a micro economic view and gender issues using regression the result show that inflation and real interest rate had a negative effect, income and old dependency had a positive impact. The analysis also suggests that increasing net income for a given gross income, improving education or relying on both is less effective than fostering stock market participation. They conclude that, all others equal, a way in which financial

intermediaries or policy makers can increase further insurance demand is by increasing financial market proximity as a whole.

Alhassan and Biekpe (2015) A study on determinants of life insurance consumption in Africa using OLS PCSE generalized method of moments estimates and the result shows Income, inflation, dependency ration and life expectancy lead to decline in life insurance consumption but financial development health expenditure and institutional quality are found positive impact on life insurance consumption.

Wireko (2015) A study on the determinants of the demand for life insurance products in Ghana – A survey of selected life insurance companies in the Kumasi Metro polies using STATA logit regression model and the result show that the Logit regression indicates a significant positive relationship between income level and the demand for life insurance products. The study found negative insignificant association between both the market rate of interest and level of savings and the demand for life insurance products. Price of insurance (level of premium) appeared to have no robust influence on life insurance consumption as showed by insignificant negative coefficient. Inflation on the other hand had an indirect association with life insurance consumption with statistically significant values. Education, employment status and the age of consumers had significant positive influence on life insurance consumption. But family size had statistically insignificant positive effect on demand.

(Sarkodie & Hadrat, 2015) A study on determinants of life insurance demand, consumer perspective a case study of ayeduase Kumasi community, Ghana used losgistic regression model and the result show that Income, number of dependents, higher education had a positive relationship with life insurance demand whereas age had negative relationship.

Zerriaa et al., (2017) A study on determinants of life insurance demand in Tunisia multiple regression log – linear model and the result show that Income, urbanization, financial development, young dependency, life expectancy had a positive impact and education and social security had negative impact whereas inflation had no impact.

b) Local Evidence

Roman (2011) a study on determinants of life insurance demand in Ethiopia using a log linear model and the result indicate that a change in income has a positively correlated in the short run, while the long run regression shows that current income is inversely related to demand for life insurance. The current price of insurance, a change in real interest rate (RIR) and gross domestic saving per-capita(GDS) have significant but inversely related to demand for life insurance in Ethiopia.

Amrot Cited as Aderaw (2013) on his article on determinants of life insurance in Ethiopia examined the determinants of life insurance by a time series data for the period 1991-2010. He identified that life insurance is determined by per capita income, life expectancy, real interest rate and inflation. It is suggested that life insurance industry in Ethiopia seriously consider these factors to bring growth in the insurance industry.

Amrot (2014) a study on determinants of life insurance demand in Ethiopia using a log linear model and the result reveled that GDP per capita, real interest rate, level of education and life expectance are positively related with life insurance demand whereas inflation is negatively related with life insurance demand. Dependence ratio does not have a statistically significant relationship with life insurance.

Luqman et al.,(2015) a study on investigation the factors influencing the life insurance market in Ethiopia by using Error Correction Mechanism(ECM). The result shows a long-term balanced connection amongst 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 old dependency ratio had a statistically significant positive relation to life insurance supply. Income, saving, real interest, urbanization, old dependency ratio, price of one unit of insurance, Death rate and life expectancy is insignificant variables. Based on the results, it is recommended that during high inflation, life insurance companies should revise price decisions to enhance the life insurance market. To minimize the inverse effect of young dependents, insurers need extensive sensitization on the young age through their families and promote products that suit the young children – such as children's education policies. With the increase in life

expectancy of individuals and groups, which results in an increase of the life insurance market, insurers have to develop products that can make provision for such societal dynamic.

Factors That Determine the Demand for Life Insurance

A thorough examination of both theoretical and empirical studies revealed the following economic and socio-demographic factors as possible drivers of life insurance consumption in emerging as well as developed economies. To direct and guide the attainment of the objectives of the study, the links existing in the various factors and demand for life insurance is also explored in greater length in this section.

Income level is the most frequently tested factor and consistently found to be of significant influence. Findings from previous studies indicated income as relating strongly with life insurance consumption. An increase in income levels has been shown as serving as an impetus for recognizing substitutes for individual life insurance on the financial market (Hammond, Houston & Melander, 1967) and as income levels improve life insurance becomes comparatively more cheaper (Brown & Kim, 1993). The level of income has been found to have positive elasticity with life insurance demand. However, as observed by Swiss Re (2013) and Enz (2000), the income elasticity of demand varies across countries depending on the level of income with higher elasticity for emerging economies compared to developed markets. It is thus expected that the income elasticity of life insurance demand Ethiopia to be positive. However, the income elasticity of demand for life insurance also depends on the type of demand facing the insurance services. If insurance is seen as a normal (inferior) good, increases in income levels stimulates higher (lower) insurance demand in the presence of other risk management tools and other market conditions. While some studies have provided evidence for insurance as a normal good, others have also provided varying conditions under which insurance can be considered to be inferior good.

Inflation: The general price level in an economy is regarded as one of the economic variables that affect life insurance consumption in many countries. Buyers have been

observed as very sensitive to anticipated and current inflation rates through reduced consumption of life insurance products (Babbel, 1981). Conclusion can be drawn that life insurance purchases reduce with expected rate of inflation as the cost of life insurance protection goes high. Other studies indicate the link between inflation and life insurance consumption is insignificant (Neumann, 1969; Fortune, 1973; Cargill &Troxel 1979). This has been explained as due to the fact that inflation itself can wear away the value of life insurance, making it a less attractive product (Brown & Ki); Redzuan et. Al., 2009) and rendering it less'beautiful' financial product (Fortune, 1973).

Premium of Insurance: The previous findings reported with respect to the effect of price on the demand for life insurance are indicated that the price of insurance is significantly and inversely related to the demand for life insurance (Babbel, 1985 and Browne and Kim, 1993). A high insurance cost tends to discourage the purchasing of life insurance. The pooled cross-sectional models, insignificance negative relation is reported (Hwang & Greenford, 2005). These researchers have opinioned that the lesser the price of insurance, the higher its expected demand. While a different study by (Sen & Madheswaran, 2007) concluded that price does not affect life insurance demand at all.

Financial Deepening 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 deepening. The measurement of financial development is very controversial (Jung, 1986), but two alternative proxies are usually employed. One is the ratio of quasi-money (M2-M1) to the broad definition of money (M2). – shows the complexity of the financial structure (higher ratio indicates higher level of financial development), another is the ratio of M2 to the nominal GDP – financial deepening (demand for money per unit of output). Broad 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 owing to the lack of data on other financial assets (Hemming and Manson, 1988, and Liu and Woo, 1994).

Education: Results from literature on the association between life insurance demand and education revealed positive impact. These conclusions were captured from the works of Savvides, 2006; Lin & Grace, 2007; Nesterova, 2008; Yusuf, Gbadamosi & Hamadu, 2009 and Curak&Gaspic, 2011. Some other studies have shown rather negative relation between the two variables. Duker, 1969; Anderson &Navin, 1975; Auerbach &Kotlikoff, 1989 are among those authors who found such results. Higher education improves life insurance demand since individuals may be in a superior position to recognize various classes of life insurance products offered on the market. Truet &Truet, 1990 and Baek &Devaney, 2005 posited that higher education may equip people with the willingness to offer financial security to dependents. It has also been cited in some studies that higher education enhances the insurance mindedness of people thereby encouraging them to patronize life insurance products more objectively (Hau, 2000). The educational attainment of individuals also reflects encouraging outlook toward life insurance purchase (Yusuf, Gbadamosi &Hamadu, 2009). This may imply why highly educated individuals have superior consciousness of life insurance leading to improved acceptance of the importance of life insurance (Savvides, 2006, Lin & Grace, 2007; Nesterova, 2008; Curak &Gaspic, 2011).

Life expectancy (LEP): Higher life expectancy is presumed to impact negatively on life insurance demand since it implies low probability of death, hence lower motivation to purchase life insurance. However, this relationship has been found to be dependent on the type of life insurance policy, hence the possibility of a positive relationship. While empirical evidence from Outreville (1996) points to a positive relationship, Li et al. (2007) finds a negative relationship.

Interest Rate: Many authors have investigated the rate of interest as a factor in demand of life insurance products. The attention on this variable has enable researchers ascertain if purchasers of life insurance products consider this variable in their buying decisions. In the literature, mixed findings have been reported about the interest rate variable. Whereas some authors reported significant positive relationship (Lim & Haberman, 2004; Haiss & Sumegi, 2008; Sen, 2008; Redzuan et al and others recorded insignificant negative association with life insurance consumption (Savvides, 2006; Li, Moshirian, Nguyen &

Wee, 2007; Nesterova, 2008; Sen, 2008).It has been argued that an increase in real domestic interest will redirect savings from long term funds to short term funds that which decreases life insurance consumption (Ibiwoye, Ideji, Oke 2010). Again, individuals are naturally unattached by lower prices to boost consumption of life insurance products, but are concerned about higher real rates so as to cut down investments in life insurance.The real rates are indicators of preference for present as against postponed consumption (Li, Moshirian & Nguyen, 2007). Confirmations from earlier studies indicate individual preference for investment in other assets over life insurance products (Nesterova, 2008).

Real interest rates are taken in order to reflect the real return of invested money of insurance company. A higher real interest rate increases life insurers' investment returns and thus their profitability, in turn offering greater profitability of financial relative to real investment for potential purchasers of life insurance policies. This is particularly accurate for life savings instruments. Moreover higher real interest rates increase the supply of capital and therefore the ability of life insurance companies to answer to potential demand. On the other, higher interest rates may induce consumers to reduce their life insurance purchases given the anticipation of higher returns. Indeed, the rise in interest rates might reduce the purchase of life insurance as higher returns on alternative assets may switch consumers from savings in life insurance to another type of money accumulation (Lenten and Rulli, 2006). Real interest rates have not been systematically included in all studies. For example, Browne and Kim (1993) neglect the influence of this variable on life insurance demand. Outreville (1996) finds the correlation of real interest rates with life insurance demand to be almost insignificant. Beck and Webb (2002) appear to detect a positive relationship using average lending rates. However, it can be noted that lending rates contain a credit risk premium that varies from one country to another, depending on its credit default experience.

Political and legal stability is important for a vibrant and growing life insurance market. As life insurance is considered to be a long-term relationships between a consumer and a company, the more stable is the legal system and, therefore, a political system in the country the higher is the willingness of contracting parties to initiate the business

relationships. Levine (1997, 1998) showed that a good investor protection will induce a higher economic growth. This situation is particularly applicable to life insurance products where relationship with companies tends to be long term. Moreover, with the increasing complexity of life insurance products, policyholder can suffer from informational asymmetry. The absence of sound legal system may also hamper the efficiency of insurers' investment, decreasing the profitability and increasing the insurance price. Finally, the lack of political stability shortens the economic horizon of both potential buyers and suppliers of life insurance products, dampening the development of a healthy life insurance market.

Savings: Various mechanisms of savings available on the financial market serve as rival products competing with life insurance. In this light Sen, 2008, argues that consumption of life insurance is enhanced when saving components are embedded in life insurance policies. Empirical results indicate indirect association between the two variables (Beck & Webb, 2003; Savvides, 2006; Redzuan et al. Buyers have preference for saving substitutes if return on life insurance product is lower relative to the substitutes (Redzuan et al). Savvides, 2006 also maintain that when individuals accumulate high savings, the incentive to purchase life insurance products reduces thereby replacing life insurance consumption with private savings.

Age: The findings from literature show direct relationship between age and life insurance consumption (Yusof, Gbadamosi &Hamadu, 2009; Tan, Wong & Law, 2009; Liebenberg, Carson & Hoyt, 2010). This is because a higher age may show improved attitude toward insurance participation and employees who are toward the end of their working life may exhibit consciousness of life after retirement (Yusof, Gbadamosi &Hamadu, 2009). However, it has been shown that as individuals mature them show better understanding of the necessity for life insurance but this consciousness reduces as people attain certain age limit. Empirical work confirms age as having indirect effect on life insurance purchase (Savvides, 2006; Hau, 2000; Liebenberg, James & Randy, 2010; Goldsmith, 1983). Older individuals may be less likely to plan for long term.

Summary of literature review

The theoretical review yields variables like income, rate of interest, current consumption and accumulated savings in wealth form as variables influencing insurance consumption. Demographic and social variables were also incorporated in theoretical models and their potential impact on an individual's life insurance consumption decision was investigated. Life insurance consumption increase, with the breadwinner's probability of death, the present level of family's consumption and the degree of risk aversion.

Different empirical studies suggests that several factors such income, inflation, real interest rate, banking sector development, savings, unemployment, pension, price of insurance education, life expectance, dependency ratio and age are considered important factors that determine life insurance demand.

The level of income is the noticeable variable which affects the demand for life insurance. Previous studies mostly show that there is significant and positive relationship between level of income and demand for life insurance Truett and Truett (1990), Browne and Kim (1993), Outreville (1996), Celik and Kayali (2009), Aderaw (2013),Mahdzan& Victorian (2013),Amrot (2014),Elisa Luciano, Outreville and Rossi (2015),Wireko (2015), (Sarkodie & Hadrat, 2015) and Zerriaa et al.,(2017

As per the literature, it is observed that inflation affects demand for life insurance in negative way (Beck and Webb (2003), Li et.al (2007), Daria (2008), Çelik and Kayali (2009), Ibiwoye et.al (2010)),Amrot (2014),Elisa Luciano, Outreville and Rossi (2015), Luqman et al., (2015),(Alhassan & Nicholas , 2015) and Wireko (2015).

In previous studies, level of education is found that there is statistically significant and positive relationship between level of education and demand for life insurance (Truett and Truett (1990) and Browne and Kim (1993), Li et.al (2007), Kakar and Shukla (2010), Mahdzan& Victorian (2013), Amrot (2014), Wireko (2015), (Sarkodie & Hadrat, 2015), explain that if education level is high, people are aware of types of life insurance and they try to protect themselves and dependents by using it.

Li et al. (2007) identified that life expectance have a significant and negative impact on the demand for life insurance.

Premium of life insurance empirical studies have shown that the premium of life insurance is negatively related to the demand for life insurance; Roman (2011)

Finally, Financial Deepening empirical studies have shown that financial deepening is positively related to the demand for life insurance; (Alhassan & Nicholas , 2015), and Zerriaa et al., (2017)

Gap in literature

But in our country Ethiopia as mentioned before there are four researchers study in this area and there finding contradict each other in the same variables.

According to Roman (2011) income positively related to life insurance demand and price, real interest rate and gross domestic saving are significant but inversely related to life insurance demand and her study period was (1980-2009). And the second researcher Aderaw (2013) said life insurance determined by income, life expectancy, real interest rate and inflation and his study period was (1991 – 2010). The third one Amrot (2014) she finds out that GDP per capital, real interest rate, education and life expectancy are positive and significant and inflation negative and significant in her study period was (1983 – 2012). The fourth one Luqman et.al..,2015) said young dependency negatively and old dependency positively related to life insurance consumption but income, saving, real interest rate, urbanization, premium of one unit of insurance, death rate and life expectance were insignificant variables and his study period was (1980 – 2008).

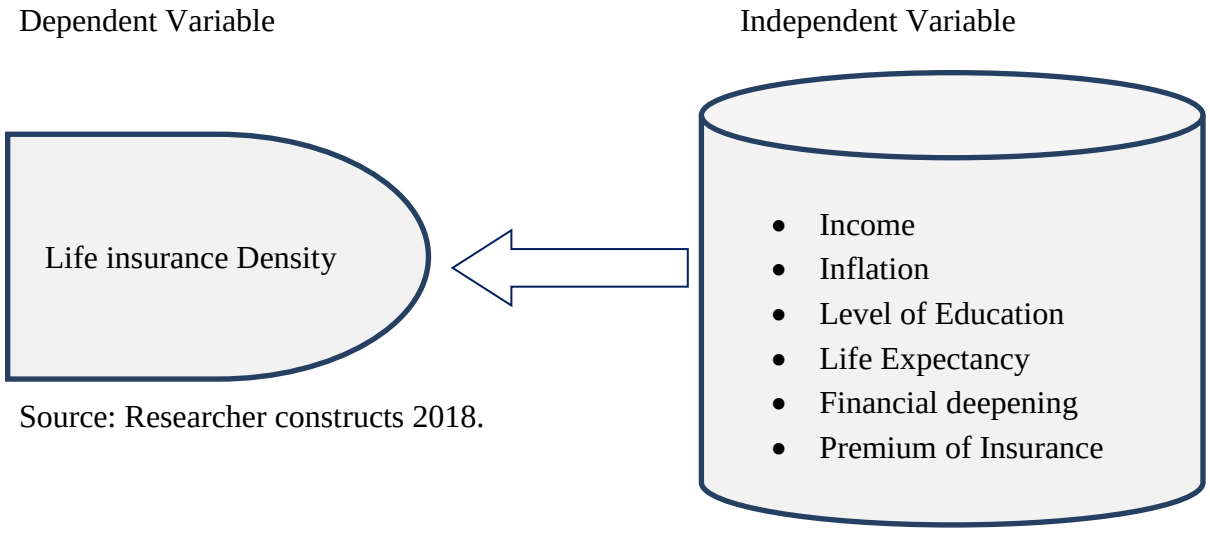
As we can saw the above paragraph the significant variable of one researcher becomes insignificant variable for another researcher so this is unclear and need to additional investigation in addition to that this study add one new variable financial deepening and there is a time gap from previous studies and this time gap has an effect for the additional variable because the Ethiopia financial deepening is increase time to time. so this study investigate the main determinants factors by studied on the variables on income, premium

of life insurance, life expectancy, financial deepening, education and inflation for the period of 1988 -2017.

2.3 Conceptual framework of the study

The conceptual framework of this study is developed based on main determinants of insurance demand which are stated in most studies. Different studies suggests that several factors such income, inflation, real interest rate, banking sector development, savings, price of insurance, education, life expectance, dependency ratio and age are considered important factors that determine life insurance demand. For this study, the researcher selected 6(Six) main determinants to test empirically in Ethiopian context. These are per capital income, inflation, level of education, life expectance, financial deepening and premium of insurance. The researcher developed the following conceptual framework.

Fig. 2.1 Conceptual framework of the Study,



Source: Researcher constructs 2018.

CHAPTER THREE

This chapter discussed the research design and approach, population and sampling techniques, types of data and tools, method of data analysis, diagnostic test of methods, validity of data, model specification, variable description and expected signs of coefficients of the variables in the model.

3. Research Methodology

Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. It is necessary for the researcher to know not only the research methods/techniques but also the methodology. (Kothari, 1990, pp. 8) in addition to this it is the science and philosophy behind all research. It goes into the heart of how we know what we know and allows us to understand the very strict constraints placed upon our concept of what knowledge actually is. (John et.al, 2007 pp. 27)

3.1 Research Design

An explanatory research tries to establish relationship that exists between variables. It aims at identifying how one variable affects the other; it seeks to provide an empirical explanation to the causes and effects relationship between one or more variables (Mark, Philip, & Adrian, 2009). The study used explanatory research design and applied quantitative techniques in analyzing data.

3.2 Population

The target population under the review is the life insurance industry in Ethiopia over a thirty (30) years period spanning the time 1988 to 2017 using time series data. This means to detect the factors determine life insurance demand in Ethiopia; Life Insurance Industry in Ethiopia was the population of the study.

Currently in Ethiopia there are 10 insurance companies engaged in life insurance business. Namely; Ethiopian Insurance Corporation (EIC), Africa insurance company

S.C, Niyala insurance company S.C, Awash Insurance Company, United Insurance Company S.C (UNIC), Naile Insurance Company S.C, Nib Insurance Company S.C, Oromiya Insurance Company S.C, Ethio Life and General Company and Abay Insurance Company S.C.

3.3 Types of Data and Tools/Instruments of Data Collection

This research used Secondary sources of data to investigate determinants of life insurance demand in Ethiopia. Therefore, the study has annual time series data and the data relevant for study collected from NBE (National Bank of Ethiopia), from 10 insurance companies those are currently sells life insurance products, CSA (Central Statistics Agency), MoFEC (Ministry of Finance and Economic Cooperation) and Economic and demographic variables are obtained from the World Bank database.

The data gathered from the secondary sources presented in tables and figures. The analytical techniques applied are regression and correlation analysis. Augmented Dickey-Fuller has used to establish correlation and regression techniques to address measurement problems often associated with estimation using time series data.

3.4 Method of Data Analysis

Descriptive as well as econometric methods were employed to discuss and analyze different issues in this study. Descriptive analysis was employed by using mean, maximum, minimum and standard deviation. An econometric analysis were used to analyze the determinants of life insurance demand based on a time series data from 1988-2017, in doing so the researcher was used Eviews8 software.

3.5 Diagnostic Test of Methods

To set up the model this study used multiple regression to cheek the effect of premium of life insurance, level of income, life expectancy, financial development, inflation and education on life insurance demand in Ethiopia.

For time – series analysis, the variables are expected to be stationary with a mean of zero and constant variance in order to examine the stationary to test whether a series is stationary or not Unit root tests used. Using Eviews8 the basic OLS assumptions were

tasted, summary of descriptive statistics for basic variables also presented, correlation analysis among basic variables also disclose and detailed discussion of the regression were performed.

3.6 Validity of Data

This study is exposed by the fact that the data obtained mainly from secondary sources and therefore any error from that data collection process definitely affects the outcome. The methodology applied for this study selected because of its suitability in its dependence on certified information from recognized institutions other than subjective opinions. This would have been associated with primary sources. The F- test and the coefficients of determination (R^2) have undertaken to test the validity and reliability of the relationship established by the regression analysis.

3.7 Model Specification

The researcher used a multiple regression log-linear model to test the effect of the abovementioned variables on life insurance demand in Ethiopia, measured by Life Insurance Density. According to Li et al. (2007), the most common specification in the studies of the determinants of life insurance demand is the log-linear form used by Browne and Kim (1993), Outreville (1996), Ward and Zurbruegg (2002) and Beck and Webb (2003). They note that this form is indicated for demand functions specified on macroeconomic variables, which display exponential growth. It creates linearity in the data and provides estimations of the coefficients on the explanatory variables that can be interpreted as elasticities.

The model was specified in such a way that it captured the various economic and demographic factors. Thus, parameters for the regression are estimated upon the regression equation indicated below:

$$LIDt = \beta 0 - \beta 1PLIt + \beta 2INCt - \beta 3LEPt - \beta 4INFt + \beta 5FDTt + \beta 6EDUt + \varepsilon t$$

LID= Life Insurance Density,

INC= Income per capital,

PLI=Premium of life insurance,

INF=Inflation,

EDU=Level of Education,

LEP= Life expectancy,

FDT= Financial deepening, and

ε is the error term at time t assumed to have mean zero E [Єt] = 0.

B0 is the constant value of the regression surface.

β1, 2, 3... 6 are parameters to be estimate and t = 1. . . 30

The used of logarithmic transformation has the advantage of allowing estimating the elasticity's of life insurance demand. Furthermore, logarithmic transformation mitigates skewers and makes variances more stable. This can help correct normality and heteroscedasticity and tends to give better estimations. So in this study the researcher transform INC and LEP to LOGINC and LOGLEP respectively. Hence both, the transformed variables are used in the descriptive analysis by using anti-logaresm.

3.8 Variables description

This section motivates the variables employed in the regression models as well explaining how they affect the demand of life insurance. It provides the background for the empirical estimation and also in helping explain the findings of this study in context of literature.

Dependent variable

Life insurance density defined as the ratio of life insurance premium volume to the country's total population. It represents per capita spending on life insurance expressed in birr. This variable is used by Ward and Zurbruegg (2002), Beck and Webb (2003), Li et al. (2007) among others**.**

Independent variables

Income level Income per capita is used as a substitute for permanent income and it is measured as the GDP at market price divided by the number of population that represents disposable personal income. In line with this, this study uses the ratio of GDP to the population to represent income per capita.

Inflation (consumer price inflation) Inflation is measured by change in consumer price index (CPI)

Premium of Insurance the ratio of the total annual premium in force to the total sums insured

Financial Deepening (FDT) following mentioned previous studies the researcher used the ratio M2 to the nominal GDP – financial deepening (demand for money per unit of output) as a measure of financial development.

Level of Education (EDU) Percentage of population in tertiary level

Life expectancy (LEP) is measured by the number of years the average individual in a country is expected to live.

Table 3.1 Measurement of the variables

Variables	Measurement
Dependent variable	
Life insurance Density	Life insurance premiums/Population
Independent variables	
Income	Gross national income per capital
Inflation	Consumer price inflation
Financial Deepening	Broad money supply (M2)/GDP Ratio
Level of Education	Percentage of population in tertiary level
Life expectancy	Average life expectancy
Premium of life insurance	The ratio of the total annual premium in force to the total sums insured

Source: Researcher constructs 2018.

3.9 Expected Signs of Coefficients of the Variables in the Model

The predicted signing of coefficients of these variables in the model i.e.: INC, FDT and EDU and were positive, implying that the demand for LID improves with an increase in these variables in the life insurance demand; all things being equal. The coefficient of LEP, INF, and PLI were expected to be negative. This implies that the demand for LID decreases with an improvement in these factors. The table below gives the summary of the signs of these variables.

Table 3.2. Expected signs of coefficients of the variables in the model

Coefficient	Interpretation	Expected Sign
INC	Income per capital	+
INF	Inflation	-
FDT	Financial deepening	+
EDU	Education	+
LEP	Life expectancy	-
PLI	Premium of life insurance	-

Source: Researcher constructs 2018.

CHAPTER FOUR

4. DATA ANALYSIS AND INTERPRETATION

This chapter discussed firstly, descriptive statistics, unit root test results, correlation analysis, regression result and discussions, regression model test (test of the classical linear regression model (CLRM) assumptions) and finally, comparison of test result with expectation.

4.1 Descriptive statistics

According to Raheman and Nasr, (2007) Descriptive statistics is the first step in analyzing average indicators of variables computed from the financial statements and the standard deviation that shows how much dispersion exists from the average value. According to Brooks, (2008), a low standard deviation indicates that the data point tend to be very close to the mean, whereas high standard deviation indicates that the data point are spread out over a large range of values. The study conducted descriptive statistic using E-views8 software in order to give the audience more understanding about the study variables that are being analyzed.

Table 4.1 Descriptive statistics

	LID	PLI	LOGINC	LOGLEP	INF	FDT	EDU
Mean	0.894159	0.022768	0.646124	0.347773	10.2707	0.344148	0.005571
Median	0.266020	0.021175	0.597148	0.346118	7.4452	0.342909	0.006407
Maximum	3.419279	0.044186	0.849950	0.363248	55.2413	0.433213	0.009342
Minimum	0.149809	0.005544	0.519027	0.332917	-10.7734	0.265268	0.000873
Std. Dev.	1.123942	0.008690	0.105389	0.010297	14.1448	0.045845	0.002751
Observations	30	30	30	30	30	30	30

Source: E-view8 Output

Table 4.1 shows a summary of the descriptive statistics of the dependent and independent variables for the life insurance industry in Ethiopia from the year 1987/1988 to 2016/2017 with total observations of 30. The table shows the mean, minimum, maximum standard deviation and number of observations for dependent (explained) variable life insurance density (LID) and independent (explanatory) variables premium of life insurance (PLI), Per capital income (INC), life expectancy (LEP), inflation (INF), financial deepening (FDT) and education (EDU).

As shown in previous chapter, life insurance density (premium per capital) was measured as the ratio of life insurance premium volume to the country's total population. Table 4.1 shows means value of 0.894159 Birr for life insurance density indicating from the total population each individual on average spends 0.894159 Birr, with 112.39% variability (standard deviation) ups and downs for the period covering from year 1987/88 to 2016/17 with the range minimum 0.149809 Birr and to the maximum 3.419279 Birr, suggesting that LID was highly dispersed or far from the mean.

Premium of life insurance was measured as the ratio of life insurance premium volume to total sum assured. Table 4.1 shows means value of 0.022768 Birr for premium of life insurance indicating from the total sum assured for each life insurance policy on average charge 0.022768 Birr with 0.86% variability (standard deviation) ups and downs for the period covering from 1987/88 to 2016/17 with the range minimum 0.005544 Birr and to the maximum 0.044186 Birr, suggesting that PLI was not highly dispersed or far from the mean.

Income (INC) was measured as the GDP at market price divided by the number of population that represents disposable personal income natural logarism were taken. According to the descriptive statistics table the mean, over the study period is 0.646124. This implies the anti – logarsem figure on table shows the average INC is 3,657.39 Birr over the study period and the standard deviation of INC was 10.53 percent, suggesting that INC was not much highly dispersed or far from the mean. While the maximum and minimum value are 0.849950 and 0.519027 and there anti- logaresm is 17,772.63 Birr and 393.67 Birr respectively

Life expectance is measured by the number of years that the average individual in a country is expected to live here also the researcher were take natural logarism. Descriptive statistics result shows that, the average LEP was 0.347773, This implies the anti – logarsem figure on table shows the average LEP 55.19 years, While the maximum and minimum value are 0.363248 and 0.332917 and there anti- logaresm is 65.50 years and 46.19 years respectively. The standard deviation of LEP was 1.04%, suggesting that LEP was not highly dispersed or not far from the mean.

Inflation (INF) is measured by CPI. The table above shows that the average INF rate for 30 years is 10.2707, the maximum amount of INF is 55.24131 and a minimum amount of INF is negative 10.7734. The standard deviation of INF was 141.448%, suggesting that INF was highly dispersed or far from the mean.

Financial Deepening (FDT) was measured as the ratio of Money supply (M2) divided to GDP. Table 4.1 shows means value of 0.344148 this implies that on average 34.41% financial deepening it occurs in the Ethiopian country with 4.58% variability (standard deviation) ups and downs for the period covering from 1987/88 to 2016/17 with the range minimum 0.265268 and to the maximum 0.433213, suggesting that FDT was not highly dispersed or far from the mean.

Education (EDU) in this study measured the level of education by Percentage of population in tertiary level. The table above shows that the average Percentage of population in tertiary level for 30 years was 0.005571 which is 0.55% of the population of Ethiopian country was in tertiary level. The standard deviation of EDU was 0.27% suggesting that EDU was not highly dispersed or far from the mean. While the maximum and minimum values are 0.009342 and 0.000873 respectively.

4.2 Unit Root Test Results

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 non-stationary, the behavior of the series can be studied only for the time period under consideration. As a consequence, it is not possible to generalize it to other time periods. Therefore, for the purpose of forecasting, non-stationary time series are of little practical value. These call for the need to test for stationarity of the series prior to detail analysis of the variables.

In order to examine the presence of unit roots in the sample data this study employed Eview8 (Augmented Dickey- Fuller, 1979) test on both at level and at first difference of all variables. For this test, intercept and trend variables are included in the regression model to capture other excluded factors that play a major role in determining life insurance demand. The null hypothesis is that variable is not stationary (has a unit root). On this test even if we add intercept and trend parameters at the right hand side of the equation the null hypothesis remains the same. The null hypothesis of a unit root is rejected if the calculated t- statistics associated with the estimated coefficient is lower than the tabulated critical value of the test at pre-determined significance level.

Decision rule:

If t* > ADF critical value, ==> not reject null hypothesis, i.e., unit root exists.

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

The table below indicates, the computed ADF test-statistic value is smaller than the critical values at 10%, 5%, 1% significant level, respectively), therefore we can reject H_o that variables have unit root. It means the PLI, LOGINC, LOGLEP, INF, FDT and EDU series do not have unit root problem and the series are stationary at 1%, 10% and 5% significant level.

Table 4.2 Augmented Dickey-Fuller unit root test statistic of independent variables

Variables	With Intercept		With Trend and Intercept	
	At Level	At 1st	At Level	At 1st
PLI	*-3.963368	*-5.926946	**-3.958042	*-5.908529
LOGINC	***-2.870512	*-5.70936	***-3.290087	*-5.608061
LOGLEP	*-5.75247	*-4.748124	*-5.749312	*-4.601273
INF	*-5.760702	*-7.228648	*-5.719142	*-7.109667
FDT	*-3.902583	*-5.768543	**-3.814933	**-3.814933
EDU	*-5.607109	*-5.607109	*-9.087867	*-9.087867

Source: E-view8 Output

*, ** and *** indicates the rejection of the null hypothesis (unit root) at 1%, 5% and 10% respectively.

Correlation Analysis

This section of the study presents the results and discussions of the person correlation analysis to identify the relationship between demands for life insurance (Life Insurance Density) in Ethiopia insurance industry and (Premium of Life Insurance, Income, Life Expectancy, Inflation, Financial Deepening and Education) Pearson correlation coefficients were used. Which is most widely used type of correlation matrix also called linear or product moment correlation. The significant level calculated for each correlation is a primary source of information about the reliability of the correlation. The values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that the two variables are perfectly related in a negative linear sense.

A correlation coefficient of 0, on the other hand indicates that there is no linear relationship between two variables (Gujarati, 2004). Since the correlation analysis shows only the degree of association, it shall be followed by multiple regression analysis. The Pearson's correlation coefficient matrix for all variables is presented below in table 4.3.

Table 4.3 Correlation Analysis of Variables

	LID	PLI	LOGINC	LOGLEP	INF	FDT	EDU
LID	1.000000						
PLI	0.123251	1.000000					
LOGINC	0.929139	0.089917	1.000000				
LOGLEP	0.742418	0.038256	0.691276	1.000000			
INF	0.010500	0.137096	0.122270	0.248775	1.000000		
FDT	-0.45428	-0.2737	-0.44159	-0.276528	-0.19257	1.000000	
EDU	0.458894	0.335204	0.242090	0.036618	0.066611	-0.54898	1.000000

Source: E-view8 Output

According to correlation result in Table 4.3 shows that Financial Deepining (FDT) is negatively related to Life insurance demand in Ethiopia. This infers that when the increase in this factors leads in the decrease in life insurance demand in Ethiopia and in reverse decreases in these factors leads increases in life insurance demand. Moreover, the coefficient estimates of correlation in the above table shows -0.45428 for financial development.

While premium of life insurance product, income, life expectancy, inflation and education are positively related with life insurance demand with coefficient estimated in the table above, 0.123251, 0.929139, 0.742418, 0.010500 and 0.458894 respectively. These figures implied that when the increase in these factors also leads to an increase in life insurance demand in Ethiopia of this study.

However, correlation analysis shows the direction and degree of associations between variables, it does not allow the researcher to make cause and effects inferences regarding the relationship between the identified variables. Thus, in examining the effects of selected independent variables on life insurance demand, the econometrics regression analysis which is discussed in the forthcoming section of the paper gives assurance to overcome the shortcomings of correlation analysis.

4.4 Regression Result and Discussions

4.4.1 Operational Model

The operational time serious regression model used to find the significant factors of determinants of life insurance demand in Ethiopia measured by life insurance density(LID) was:-

$$LID_t = \beta_0 - \beta_1 PLI_t + \beta_2 INC_t - \beta_3 LEP_t - \beta_4 INF_t + \beta_5 FDT_t + \beta_6 EDU_t + \varepsilon_t$$

LID= 6.689208-2.266730PLI+14.26772LOGINC-47.62009LOGLEP+0.00274INF +3.19954FDT +94.26639EDU

Table 4.4 below shows regression results between the dependent variable and explanatory variables. The R –squared value measured how well the regression model explains the actual variations in the dependent variable (Brooks, 2008). The R-squared and Adjusted R-squared values are 0.96 and 0.94 respectively and it is an indication that the model is a good fit. This means more than 94% of variations in life insurance demand in Ethiopia were explained by independent variables included in the model.

Furthermore, the F- statistic shows 92.06562 and the probability of not rejecting the null hypothesis that there is no statistically significant relationship existing between the dependent variable LID and the independent variables , is 0.000000 indicates that the overall model is highly significant at 1% and that all the independent variables are jointly significant in causing variation in life insurance demand.

Table 4.4 Regression results

Dependent Variable: LID

Method: Least Squares

Date: 05/24/18 Time: 05:39

Sample: 1988 2017

Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.689208	3.921983	1.705568	0.1016
PLI	-2.266730	5.798449	-0.390920	0.6995
LOG_INC	14.26772	1.414969	10.08341	0.0000
LOG_LEP	-47.62009	13.79567	-3.451815	0.0022
INF	-0.002747	0.004154	-0.661225	0.5150
FDT	3.199547	1.381734	2.315603	0.0298
EDU	94.26639	22.54977	4.180371	0.0004

R-squared	0.960027	Mean dependent var	0.894159
Adjusted R-squared	0.949600	S.D. dependent var	1.123942
S.E. of regression	0.252325	Akaike info criterion	0.284766
Sum squared resid	1.464362	Schwarz criterion	0.611712
Log likelihood	2.728513	Hannan-Quinn criter.	0.389359
F-statistic	92.06562	Durbin-Watson stat	1.357427
Prob(F-statistic)	0.000000		

Source: E-view8 Output

Furthermore table 4.4 shows that four explanatory variables had significant effect on life insurance demand in Ethiopia. The significant variables are ranked based on their significant levels: Income (INC), Education (EDU), Life expectancy (LEP) and Financial deepening (FDT) were significant at 1% and 5% significant level since the p –value for those variables were (0.0000), (0.0004), (0.0022) and (0.0298) respectively.

Apart from that, Table 4.4 above shows that two explanatory variables had insignificant effect on life insurance demand in Ethiopia. Namely premium of life insurance (PLI) and inflation (INF) were insignificant at 5% significance level since the P- value for those variables were (0.6995) and (0.5150) respectively.

Income per capita: the results of the multiple regression analysis show that income per capita has a positive and statistically significant effect on life insurance demand in Ethiopia with a regression coefficient of 14.26772 and p-value of 0.0000. Holding other factors constant if per capital income increased by 1% the life insurance demand will increased by 14.26772 birr and the relationship is statistically significant at 1% significant level. Therefore, the study fails to rejects the null hypothesis that there is positive and significant relationship between demand for life insurance and income. And this tells us if the income of a person increased his/her ability to buy life insurance product will increased.

This is consistent with many empirical studies (Cargill and Troxel, 1979; Rubayah and Zaidi, 2000; Aderaw, 2013; Li et al., 2007; Beck and Webb, 2003; Outreville,1996; Babble, 1985; Truett and Truett,1990; Browne and Kim, 1993; Fortune, 1973; Campbell, 1980; Beenstock, Dickinson, Khajuria,1986; Lewis,1989; Ward and Zurbruegg, 2000; Mantis and Farmer, 1968. However, Lim and Haberman (2004), Mahdzan & Victorian (2013); Amrot (2014); Elisa et al.,(2015);Wireko (2015); Sarkodie & Hadrat, (2015); Zerriaa et al.,(2017), based on the study conducted in Malaysia, suggested that income per capita was not a key factor in explaining the demand in life insurance demand.

Level of Education: the results of the multiple regression analysis show that education in tertiary level has a positive and statistically significant influence on life insurance demand in Ethiopia with a regression coefficient of 94.26639 and p-value of 0.0004. All other things remain constant if on average education in tertiary level increased by 1% the life insurance demand will increased 94.26639 birr and the relationship is statistically significant at 1% significant level. Therefore, the study fails to rejects the null hypothesis that there is positive and significant relationship between demand for life insurance and education in tertiary level.

And this tells us when the country's number of higher education student increase the life insurance demand will increase because the understanding of life insurance product is easy for those portions of the population. This is consistent with many empirical studies (Truett and Truett, 1990; Browne and Kim,1993; Outreville, 1996; Zietz, 2003; Amrot

(2014) and Sarkodie & Hadrat (2015)). (Beck and Webb, 2002) founds insignificant relationship between the variable of literacy rate and the life insurance demand.

Life Expectancy: the results of the multiple regression analysis show that life expectancy has a negative and statistically significant influence on life insurance demand in Ethiopia with a regression coefficient of -47.62009 and p-value of 0.0022. Holding other factors constant if life expectancy of an individual increased by 1% the life insurance demand will decrease by 47.62009 birr and the relationship is statistically significant at 1% significant level.

And this tells us when an individual life expectancy decrease he/she will interest to buy life insurance product. This is consistent with studies of Li et al. (2007) and Alhassan and Biekpe (2015). However, Browne and Kim (1993) found that life expectancy is an insignificant factor affecting the demand for life insurance. On the other hand, Lewis (1989) argued that life expectancy is inversely related to death probability the expected relationship between life insurance demand and life expectancy is ambiguous.

Financial Deepening: the results of the multiple regression analysis show that financial deepening has a positive and statistically significant influence on life insurance purchase demand in Ethiopia with a regression coefficient of 3.199547 and p-value of 0.0298. By holding other factors constant if financial deepening is increased by 1 the life insurance demand will increased by 3.199547 birr and the relationship is statistically significant at 5% significant level.

Therefore, the study fails to rejects the null hypothesis that there is positive and significant relationship between demand for life insurance and financial development. And this tells us when the country financial deepening increase the purchasing power of life insurance will increased. This is consistent with studies of (Outreville, 1996; Lim and Haberman, 2004; Alhasssan and Biekpe (2015) & Zerriaa et al.,(2017)).

Premium of life Insurance: the results of the multiple regression analysis show that premium of life insurance has inversely and insignificant influence on life insurance demand in Ethiopia with a regression coefficient of -2.266730 and p-value of 0.6995.

This is not consistent with studies of (Babbel, 1985; & Browne and Kim, 1993). However, this is consistence with the finding of Outreville (1996).

Inflation: the results of the multiple regression analysis show that inflation has a negative and insignificant influence on life insurance purchase demand in Ethiopia with a regression coefficient of -0.002747and p-value of 0.5150. This is not consistent with the empirical studies (Browne and Kim, 1993; Outreville, 1996; Cargill and Troxel, 1979; Babbel, 1981; Browne and Kim, 1993; Beck and Webb, 2002; Ward and Zurbruegg, 2002; Aderaw, 2013; Li et al., 2007. However, the findings of Rubayah and Zaidi (2000) are in line with this finding that shows an insignificant positive relationship between inflation rates and the demand for life insurance.

4.5 Regression model test (Tests for the Classical Linear Regression Model (CLRM) Assumptions)

For valid hypothesis testing and to make data available for reliable results, the test of assumption of regression model is required. In this study diagnostic tests (errors have zero mean, normality, Multicollinearity, Hetroskedasticity and Autocorrelation) were carried out to ensure that the data fits the basic assumptions of classical linear regression model. Consequently, the results for the model assumption tests are presented as follows:

4.5.1 The errors have zero mean (E=0)

According to Brooks (2008), if a constant term is constituted in the regression equation, this assumption should never be violated. Accordingly, in this study the regression model constitute a constant term; as a result this assumption is not violated.

4.5.2 Homoscedasticity (variance of the errors is Constant)

The assumption of homoscedasticity is that the residuals are approximately equal for the predicated dependent variable scores the variance of the errors is constant, if the errors do not have a constant variance, it is said that the assumption of homoscedasticity has been violated. This violation is termed as heteroscedasticity. The presence of hetroskedasticity makes the standard errors too big or too low and hence any inferences made could be misleading.

The most popular method, a "white" test has to be made, to ensure that this assumption is no longer violated. If the probability of F-statistics, observed R-square, and Scaled explained SS of the hetrroscedastic white test result is in excess of 5% then there is no hetroscedastic problem. However, if one of these there is fail then there is existence of hetroscedastic problem (Brook, 2008). In this study white test was used to test for existence of heteroscedasticity across the range of explanatory variables.

Table 4.5. Heteroskedasticity test

Heteroskedasticity Test: White

F-statistic	0.595586	Prob. F(6,23)	0.7307
Obs*R-squared	4.034296	Prob. Chi-Square(6)	0.6720
Scaled explained SS	2.177330	Prob. Chi-Square(6)	0.9027

Source: E- view8 Output

As the result in table 4.5 shows, the p – values for F -statistic, Obs*R –squared and Scaled explained SS are 0.7307, 0.6720 and 0.9027 respectively and this versions of the test statistic give the same conclusion that reveals the absence of heteroscedasticity. Since, all p –values are greater than 0.05. This implies that the assumption of homoscedasticity or errors have a constant variance is not violated.

4.5.3 Covariance between the error terms over time is zero

The autocorrelation assumption is made of the CLRM's disturbance terms is that the covariance between the error terms over time is zero; this is an assumption that the errors are linearly independent of one another and the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are serially correlated. Usually, Durbin - Watson (DW) test is used for first order autocorrelation. It tests a relationship between an error term and its immediately previous value.

The DW test statistic value in the regression result was 1.35 this is inconclusive region so we cannot tell about the autocorrelation by seeing DW so the researcher need to take further test. In this study Breusch-Godfrey Serial Correlation LM Test was used to test

for the existence of autocorrelation it is the general test of autocorrelation we use higher order autocorrelation and the null hypothesis is no autocorrelation.

Table 4.6 Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.467880	Prob. F(3,20)	0.2534
Obs*R-squared	5.413504	Prob. Chi-Square(3)	0.1439

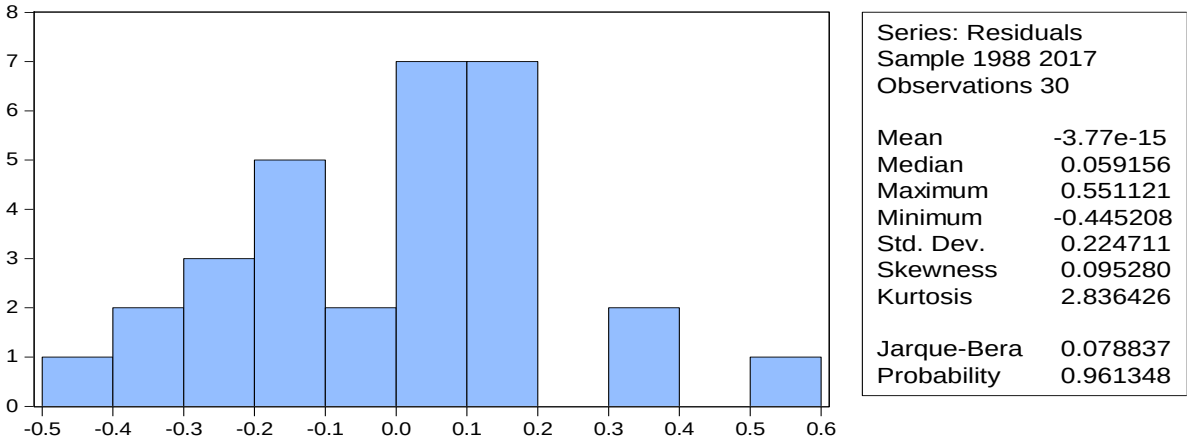
Source: E-view8 Output

As the result in table 4.6 shows, the p – values for F –statistic and Obs*R –squared are 0.2534 and 0.1439 respectively and this versions of the test statistic give the same conclusion that reveals the absence of autocorrelation. Since, all p –values are greater than 0.05. This implies that the assumption of Covariance between the error terms over time is zero (cov(ui,uj) = 0 is not violated.

4.5.4 Normality (Errors are Normally Distributed)

According to Brooks (2008), the normality of the data was mainly cheked with the popular Jarque-Bera test statistic, if the residuals are normally distributed, the histogram should be bell – shaped and the Jarque- Bera statistic would not be significant. This means that the p –value given at the bottom of the normality test screen should be greater than 0.05 to support the null hypothesis of presence of normal distribution at the 5 percent level.

Figure 4.1 Normality Test Result



Source: E-view8 Output

Accordingly Jarque-Bera statistic in figure 4.1 has a p –value of 0.961348 implies that the p-value for the Jarque-Bera test for the model is very far greater than 5% which indicates that the errors are normally distributed. Furthermore, according to Brooks (2008) the standardized measurements of a distribution are known as its skewness and kurtosis. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how fat the tails of the distribution area. A normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3. Skewness that is normal involves a perfectly symmetric distribution. Kurtosis involves the stickiness of the distribution. Kurtosis that is normal involves a distribution that is bell – shaped and not too peaked or flat. The results for the tests of both Skewness and Kurtosis also Presented above figure 4.1 are fitted according to their expected conditions.

4.5.5 Multicollinearity Test

Multicollinearity indicates a linear relationship (correlations) among explanatory variables. When independent variables are multicollinear, there is overlap or sharing of predictive power. This may lead to the paradoxical effect, where by the regression model fits the data well, but none of the explanatory variables (individually) has a significant impact in predicting the dependent variable Gujarati, (2004). Cooper and Schendlar (2009) suggested that a correlation above 0.8 should be corrected for. In addition, rule of

tomb stated that multicollinearity problems exists when the correlation coefficient among variables should be greater than 0.7.

Table 4.7 Correlation Matrix of Explanatory Variables

	PLI	LOGINC	LOGLEP	INF	FDT	EDU
PLI	1.000000					
LOGINC	0.089917	1.000000				
LOGLEP	0.038256	0.691276	1.000000			
INF	0.137096	0.122270	0.248775	1.000000		
FDT	-0.2737	-0.44159	-0.276528	-0.19257	1.000000	
EDU	0.335204	0.242090	0.036618	0.066611	-0.54898	1.000000

Source: E-view8 Output

The results in the above correlation matrix table 4.7 show that the highest correlation of 0.691276 which is between income and life expectancy. Therefore, it is possible to conclude that there is no problem of multicollinearity.

4.6 Comparison of test Result with Expectation

Table 4.8 Comparison of test result with expectation

Explanatory Variables	Expected Result in Relation to LID	Actual Result	Statistical Significance
Premium of life insurance demand (PLI)	−	−	Insignificant
Income (INC)	+	+	1%
Life Expectancy (LEP)	−	−	1%
Inflation (INF)	−	−	Insignificant
Financial Deepening (FDT)	+	+	5%
Education (EDU)	+	+	1%

Source: Researcher's construct 2018

CHAPTER FIVE

5 SUMMARY OF MAJOR FINDINGS, CONCLUSION AND RECOMMENDATION

This chapter comprises three sections which include summary of major findings, conclusions and recommendations.

5.1 Summary of Major Findings

The research on the title of: Determinants of Life Insurance Demand in Ethiopia: the study had gone through an empirical analysis. As a result of the analysis and interpretation, the following are the summary of the findings.

- Per capital income (LOGINC) has a positive and significant effect on life insurance demand in Ethiopia.
- Level of education (EDU) has a positive and significant influence on life insurance demand in Ethiopia.
- Life expectancy (LOGLEP) has a negative and significant influence on life insurance demand in Ethiopia.
- Financial Deeping (FDT) has a positive and significant effect on life insurance demand in Ethiopia.
- On other side of variables, the result revealed that there is insignificant relationship of premium of life insurance (PLI) and inflation (INF) to life insurance demand in Ethiopia.

5.2 Conclusions

The main purpose of the study was to examine the determinants of life insurance demand in Ethiopia. Quantitative research approach used to carry out the study. Also, secondary data obtained from National Bank of Ethiopia, published Annual Reports, MoFEC, CSA and from 10 insurance companies those are selling life insurance product and World Bank were used in this study. The time period of the study took place from 1988 up to 2017.

Based on the summary result of empirical analysis, the study concluded the following to determinants of life insurance demand by taking life insurance industry in Ethiopia as evidence of for this study.

- Income per capita has a positive and statistically significant effect on life insurance demand in Ethiopia. And this tells us income has a direct relations ship if one individual has an income that can afford to buy life insurance cover but it depends on the individual income.

- The findings of this study indicate life expectancy negatively influence the demand for life insurance policy in Ethiopia. A change in this variable has a significant negative relationship with the demand for life insurance. Because life expectancy is the determinate for life premium it depends on that to determine risk of death. In our current situation and study revealed that if a person life expectancy increase a probability of buying life insurance will decrease.

- Education has positive and statistically significant influence on the demand for life insurance policy in Ethiopia. A change in these variables has a significant positive relationship with the demand for life insurance. And this tells us when the country number of higher education student increase the life insurance demand will increase because education is important to understand the advantage of life insurance product is easy for those portions of the population.

- Financial Deeping has positive and statistically significant influence on the demand for life insurance policy in Ethiopia. A change in financial deepening has a significant and positive effect on the demand for life insurance. And this tells us as financial deepening is a very crucial as the economic situation improves people will have money to afford (even think of life insurance) and buy life cover

- On the other hand the findings tells premium of life insurance insignificant variable the researcher conclude that in Ethiopia people did not buy the life insurance product not because of the affordability of the insurance premium but people do not think for the future. People spend on many trivial things they do

not prioritized their needs. Inflation also insignificant variable for this study the researcher conclude that inflation has not any effect on life insurance demand in Ethiopia.

The study also show that income per capita, education and financial deepening have positive and statistically significant influence on the demand for life insurance policy in Ethiopia. A change in these variables has a significant positive relationship with the demand for life insurance. Among these explanatory variables, income per capital and education are the most influential macro-economic factors followed by life expectancy (among the macro demographic factors) and financial development.

5.3 Recommendations

The researcher recommends some alternatives to promote and increase demand for life insurance in Ethiopia. As we know, life insurance is sub-sector under financial sector that become an important role as contributor to economic growth. The growth in life insurance will bring a lot of benefit in economy as well as society as a whole.

- As can be been seen from conclusions drawn, GDP per capita (income) is the determinant factor that explains demand for life insurance. Therefore, the government tries to give much emphasis in increasing GDP per capita (real income) of society through more investment, and job creation.

- In addition to the above, Government bodies, like National Bank of Ethiopia and Ethiopian Insurance Companies Association try to support the sector as a whole and life insurance in particular in providing training to domestic actuarial service providers.

- Insurance education by life insurance companies: It is worthwhile to have high consideration of incorporating the risk management and insurance as a major course in tertiary levels of curriculum. Because the of education in tertiary level as a measure of understanding insurance is important factor influences the life insurance demand positively. And their level of education in general increase, risk aversions will be their primary concern. Therefore, the curriculum designers

in general and insurance companies in particular should engage in insurance education.

- Finally, different studies suggested that several factors such as income, inflation, real interest rate, banking sector development, political and legal stability, interest, savings deposits rate, premium of insurance, level of education, life expectancy and age are considered to be important factors that determine demand for life insurance. However, on this study the researcher selected only six determinants to test empirically in Ethiopian context. Therefore, the researcher would like to recommend for those researchers who want to conduct study on the subject, they try to include other variables as possible as they can.

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II. Appendix: Heteroskedasticity Test

Heteroskedasticity Test: White

F-statistic	0.595586	Prob. F(6,23)	0.7307
Obs*R-squared	4.034296	Prob. Chi-Square(6)	0.6720
Scaled explained SS	2.177330	Prob. Chi-Square(6)	0.9027

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 05/24/18 Time: 05:43

Sample: 1988 2017

Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.258071	0.594162	-0.434344	0.6681
PLI^2	-33.67182	33.25563	-1.012515	0.3218
LOG_INC^2	-0.066257	0.313546	-0.211316	0.8345
LOG_LEP^2	3.096499	5.929375	0.522230	0.6065
INF^2	-4.71E-07	2.29E-05	-0.020585	0.9838
FDT^2	-0.330935	0.539224	-0.613725	0.5454
EDU^2	536.3455	665.6410	0.805758	0.4286

R-squared	0.134477	Mean dependent var	0.048812
Adjusted R-squared	-0.091312	S.D. dependent var	0.067278
S.E. of regression	0.070283	Akaike info criterion	-2.271612
Sum squared resid	0.113613	Schwarz criterion	-1.944665
Log likelihood	41.07417	Hannan-Quinn criter.	-2.167019
F-statistic	0.595586	Durbin-Watson stat	1.741013
Prob(F-statistic)	0.730711		

III. Appendix: Breusch-Godfrey Serial Correlation LM Test:

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.467880	Prob. F(3,20)	0.2534
Obs*R-squared	5.413504	Prob. Chi-Square(3)	0.1439

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 05/24/18 Time: 05:42

Sample: 1988 2017

Included observations: 30

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.407437	3.816611	0.106754	0.9160
PLI	-3.678719	6.162589	-0.596944	0.5572
LOG_INC	0.088158	1.423735	0.061920	0.9512
LOG_LEP	-1.511430	13.67267	-0.110544	0.9131
INF	0.003323	0.004373	0.759965	0.4561
FDT	0.242825	1.960090	0.123885	0.9026
EDU	3.477045	28.21609	0.123229	0.9032
RESID(-1)	0.451896	0.272045	1.661104	0.1123
RESID(-2)	-0.195153	0.252011	-0.774384	0.4478
RESID(-3)	-0.132269	0.285401	-0.463449	0.6480

R-squared	0.180450	Mean dependent var	-3.77E-15
Adjusted R-squared	-0.188347	S.D. dependent var	0.224711
S.E. of regression	0.244961	Akaike info criterion	0.285766
Sum squared resid	1.200117	Schwarz criterion	0.752832
Log likelihood	5.713513	Hannan-Quinn criter.	0.435184
F-statistic	0.489293	Durbin-Watson stat	2.011086
Prob(F-statistic)	0.864687		

IV. Appendix: Unit Root Test

Null Hypothesis: D(PLI) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.926946	0.0000
Test critical values:	1% level	-3.699871	
	5% level	-2.976263	
	10% level	-2.627420	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(PLI,2)

Method: Least Squares

Date: 05/24/18 Time: 05:08

Sample (adjusted): 1991 2017

Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PLI(-1))	-1.676500	0.282861	-5.926946	0.0000
D(PLI(-1),2)	0.429304	0.183486	2.339706	0.0279
C	-0.000473	0.001777	-0.266182	0.7924

R-squared	0.659776	Mean dependent var	-0.000194
Adjusted R-squared	0.631424	S.D. dependent var	0.015196
S.E. of regression	0.009226	Akaike info criterion	-6.429198
Sum squared resid	0.002043	Schwarz criterion	-6.285217
Log likelihood	89.79418	Hannan-Quinn criter.	-6.386385
F-statistic	23.27092	Durbin-Watson stat	1.975623
Prob(F-statistic)	0.000002		

Null Hypothesis: D(PLI) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.908529	0.0003
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(PLI,2)

Method: Least Squares

Date: 05/24/18 Time: 05:10

Sample (adjusted): 1991 2017

Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PLI(-1))	-1.720260	0.291149	-5.908529	0.0000
D(PLI(-1),2)	0.455622	0.188342	2.419116	0.0239
C	-0.003337	0.004176	-0.799116	0.4324
@TREND("1988")	0.000178	0.000235	0.759384	0.4553

R-squared	0.668098	Mean dependent var	-0.000194
Adjusted R-squared	0.624806	S.D. dependent var	0.015196
S.E. of regression	0.009308	Akaike info criterion	-6.379888
Sum squared resid	0.001993	Schwarz criterion	-6.187912
Log likelihood	90.12848	Hannan-Quinn criter.	-6.322803
F-statistic	15.43252	Durbin-Watson stat	1.993741
Prob(F-statistic)	0.000010		

Null Hypothesis: D(EDU) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.607109	0.0001
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EDU,2)

Method: Least Squares

Date: 05/24/18 Time: 05:13

Sample (adjusted): 1990 2017

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EDU(-1))	-1.095306	0.195342	-5.607109	0.0000
C	4.36E-05	0.000291	0.149725	0.8821

R-squared	0.547351	Mean dependent var	5.60E-06
Adjusted R-squared	0.529942	S.D. dependent var	0.002249
S.E. of regression	0.001542	Akaike info criterion	-10.04277
Sum squared resid	6.18E-05	Schwarz criterion	-9.947608
Log likelihood	142.5987	Hannan-Quinn criter.	-10.01367
F-statistic	31.43967	Durbin-Watson stat	1.997952
Prob(F-statistic)	0.000007		

Null Hypothesis: D(EDU,2) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.087867	0.0000
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EDU,3)

Method: Least Squares

Date: 05/24/18 Time: 05:14

Sample (adjusted): 1991 2017

Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EDU(-1),2)	-1.549652	0.170519	-9.087867	0.0000
C	-9.79E-05	0.000876	-0.111715	0.9120
@TREND("1988")	6.57E-06	4.92E-05	0.133530	0.8949

R-squared	0.774837	Mean dependent var	-7.50E-07
Adjusted R-squared	0.756073	S.D. dependent var	0.004034
S.E. of regression	0.001993	Akaike info criterion	-9.494353
Sum squared resid	9.53E-05	Schwarz criterion	-9.350372
Log likelihood	131.1738	Hannan-Quinn criter.	-9.451540
F-statistic	41.29469	Durbin-Watson stat	2.349414
Prob(F-statistic)	0.000000		

Null Hypothesis: D(INF) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.228648	0.0000
Test critical values:	1% level	-3.699871	
	5% level	-2.976263	
	10% level	-2.627420	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INF,2)

Method: Least Squares

Date: 05/24/18 Time: 05:15

Sample (adjusted): 1991 2017

Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-2.232285	0.308811	-7.228648	0.0000
D(INF(-1),2)	0.486057	0.178057	2.729783	0.0117
C	0.106723	3.023511	0.035298	0.9721

R-squared	0.810436	Mean dependent var	0.272117
Adjusted R-squared	0.794639	S.D. dependent var	34.66743
S.E. of regression	15.71015	Akaike info criterion	8.450931
Sum squared resid	5923.415	Schwarz criterion	8.594913
Log likelihood	-111.0876	Hannan-Quinn criter.	8.49374
F-statistic	51.30322	Durbin-Watson stat	2.059762
Prob(F-statistic)	0.000000		

Null Hypothesis: D(INF,2) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 4 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.648910	0.0007
Test critical values:	1% level	-4.416345	
	5% level	-3.622033	
	10% level	-3.248592	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INF,3)

Method: Least Squares

Date: 05/24/18 Time: 05:17

Sample (adjusted): 1995 2017

Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1),2)	-8.306397	1.470442	-5.648910	0.0000
D(INF(-1),3)	5.556167	1.289928	4.307345	0.0005
D(INF(-2),3)	3.388095	0.944083	3.588768	0.0025
D(INF(-3),3)	1.560134	0.535845	2.911540	0.0102
D(INF(-4),3)	0.406661	0.194583	2.089916	0.0529
C	7.353559	8.998241	0.817222	0.4258
@TREND("1988")	-0.411057	0.470537	-0.873590	0.3953

R-squared	0.945302	Mean dependent var	0.231681
Adjusted R-squared	0.924791	S.D. dependent var	53.74738
S.E. of regression	14.73984	Akaike info criterion	8.464776
Sum squared resid	3476.207	Schwarz criterion	8.810361
Log likelihood	-90.34492	Hannan-Quinn criter.	8.551689
F-statistic	46.08622	Durbin-Watson stat	2.236837
Prob(F-statistic)	0.000000		

Null Hypothesis: D(FDT) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.902583	0.0060
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(FDT,2)

Method: Least Squares

Date: 05/24/18 Time: 05:18

Sample (adjusted): 1990 2017

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDT(-1))	-0.759050	0.194499	-3.902583	0.0006
C	0.001026	0.004828	0.212534	0.8333

R-squared	0.369394	Mean dependent var	0.000696
Adjusted R-squared	0.345140	S.D. dependent var	0.031564
S.E. of regression	0.025543	Akaike info criterion	-4.428192
Sum squared resid	0.016963	Schwarz criterion	-4.333034
Log likelihood	63.99468	Hannan-Quinn criter.	-4.399101
F-statistic	15.23016	Durbin-Watson stat	1.906760
Prob(F-statistic)	0.000602		

Null Hypothesis: D(FDT,3) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=7)

Augmented Dickey-Fuller test statistic		-5.749842	0.0004
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	Null Hypothesis: D(FDT,2) has a unit root	-3.233456	
	Exogenous:		

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

t-Statistic Prob.*

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(FDT,3)

Method: Least Squares

Date: 06/01/18 Time: 09:35

Sample (adjusted): 1992 2017

Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDT(-1),2)	-1.863034	0.324015	-5.749842	0.0000
D(FDT(-1),3)	0.385145	0.196365	1.961370	0.0626
C	-0.009226	0.014178	-0.650691	0.5220
@TREND("1988")	0.000565	0.000782	0.722271	0.4777

R-squared	0.717607	Mean dependent var	0.001770
Adjusted R-squared	0.679099	S.D. dependent var	0.052550
S.E. of regression	0.029769	Akaike info criterion	-4.050093
Sum squared resid	0.019496	Schwarz criterion	-3.856540
Log likelihood	56.65121	Hannan-Quinn criter.	-3.994357
F-statistic	18.63519	Durbin-Watson stat	2.160900
Prob(F-statistic)	0.000003		

Null Hypothesis: D(FDT) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.902583	0.0060
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(FDT,2)

Method: Least Squares

Date: 05/24/18 Time: 05:18

Sample (adjusted): 1990 2017

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDT(-1))	-0.759050	0.194499	-3.902583	0.0006
C	0.001026	0.004828	0.212534	0.8333

R-squared	0.369394	Mean dependent var	0.000696
Adjusted R-squared	0.345140	S.D. dependent var	0.031564
S.E. of regression	0.025543	Akaike info criterion	-4.428192
Sum squared resid	0.016963	Schwarz criterion	-4.333034
Log likelihood	63.99468	Hannan-Quinn criter.	-4.399101
F-statistic	15.23016	Durbin-Watson stat	1.906760
Prob(F-statistic)	0.000602		

Null Hypothesis: D(LOG_INC) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.870512	0.0616
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOG_INC,2)

Method: Least Squares

Date: 05/24/18 Time: 05:29

Sample (adjusted): 1990 2017

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG_INC(-1))	-0.460535	0.160437	-2.870512	0.0080
C	0.005606	0.002326	2.409738	0.0233

R-squared	0.240651	Mean dependent var	0.000365
Adjusted R-squared	0.211445	S.D. dependent var	0.008591
S.E. of regression	0.007629	Akaike info criterion	-6.844900
Sum squared resid	0.001513	Schwarz criterion	-6.749743
Log likelihood	97.82860	Hannan-Quinn criter.	-6.815809
F-statistic	8.239841	Durbin-Watson stat	2.271303
Prob(F-statistic)	0.008040		

Null Hypothesis: D(LOG_INC,2) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.608061	0.0006
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOG_INC,3)

Method: Least Squares

Date: 05/24/18 Time: 05:30

Sample (adjusted): 1992 2017

Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG_INC(-1),2)	-1.877081	0.334711	-5.608061	0.0000
D(LOG_INC(-1),3)	0.333303	0.199512	1.670586	0.1090
C	0.001713	0.003868	0.442922	0.6621
@TREND("1988")	-7.38E-05	0.000213	-0.346829	0.7320

R-squared	0.740258	Mean dependent var	-0.000268
Adjusted R-squared	0.704839	S.D. dependent var	0.014917
S.E. of regression	0.008104	Akaike info criterion	-6.652177
Sum squared resid	0.001445	Schwarz criterion	-6.458623
Log likelihood	90.47830	Hannan-Quinn criter.	-6.596440
F-statistic	20.89982	Durbin-Watson stat	2.013642
Prob(F-statistic)	0.000001		

Null Hypothesis: D(LOG_LEP) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.752470	0.0001
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOG_LEP,2)

Method: Least Squares

Date: 05/24/18 Time: 05:31

Sample (adjusted): 1990 2017

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG_LEP(-1))	-1.120000	0.194699	-5.752470	0.0000
C	0.001200	0.000637	1.882938	0.0709

R-squared	0.560000	Mean dependent var	0.000000
Adjusted R-squared	0.543077	S.D. dependent var	0.004714
S.E. of regression	0.003187	Akaike info criterion	-8.591032
Sum squared resid	0.000264	Schwarz criterion	-8.495874
Log likelihood	122.2744	Hannan-Quinn criter.	-8.561941
F-statistic	33.09091	Durbin-Watson stat	2.032727
Prob(F-statistic)	0.000005		

Null Hypothesis: D(LOG_LEP,2) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 4 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.601273	0.0068
Test critical values:	1% level	-4.416345	
	5% level	-3.622033	
	10% level	-3.248592	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOG_LEP,3)

Method: Least Squares

Date: 05/24/18 Time: 05:33

Sample (adjusted): 1995 2017

Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG_LEP(-1),2)	-4.172876	0.906896	-4.601273	0.0003
D(LOG_LEP(-1),3)	2.300396	0.783699	2.935307	0.0097
D(LOG_LEP(-2),3)	1.557991	0.597913	2.605714	0.0191
D(LOG_LEP(-3),3)	0.948218	0.382214	2.480854	0.0246
D(LOG_LEP(-4),3)	0.428036	0.181940	2.352617	0.0318
C	0.000195	0.002067	0.094316	0.9260
@TREND("1988")	-2.56E-05	0.000107	-0.238568	0.8145

R-squared	0.848176	Mean dependent var	9.43E-18
Adjusted R-squared	0.791242	S.D. dependent var	0.007385
S.E. of regression	0.003374	Akaike info criterion	-8.299386
Sum squared resid	0.000182	Schwarz criterion	-7.953801
Log likelihood	102.4429	Hannan-Quinn criter.	-8.212473
F-statistic	14.89749	Durbin-Watson stat	2.084671
Prob(F-statistic)	0.000010		

Null Hypothesis: D(LID) has a unit root

Exogenous: Constant

Lag Length: 7 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.812468	0.0095
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LID,2)

Method: Least Squares

Date: 05/24/18 Time: 05:34

Sample (adjusted): 1997 2017

Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LID(-1))	-11.39234	2.988181	-3.812468	0.0025
D(LID(-1),2)	10.77272	2.849234	3.780916	0.0026
D(LID(-2),2)	11.07491	3.131590	3.536515	0.0041
D(LID(-3),2)	12.74459	3.488243	3.653583	0.0033
D(LID(-4),2)	16.02719	4.247783	3.773072	0.0027
D(LID(-5),2)	15.74378	5.267856	2.988651	0.0113
D(LID(-6),2)	16.42433	4.796365	3.424329	0.0050
D(LID(-7),2)	7.932922	4.288495	1.849815	0.0891
C	0.074461	0.049930	1.491308	0.1617

R-squared	0.790037	Mean dependent var	-8.19E-05
Adjusted R-squared	0.650061	S.D. dependent var	0.281220
S.E. of regression	0.166358	Akaike info criterion	-0.451828
Sum squared resid	0.332098	Schwarz criterion	-0.004175
Log likelihood	13.74419	Hannan-Quinn criter.	-0.354676
F-statistic	5.644107	Durbin-Watson stat	1.810795
Prob(F-statistic)	0.003981		

Null Hypothesis: D(LOG_INC,2) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.709360	0.0001
Test critical values:	1% level	-3.711457	
	5% level	-2.981038	
	10% level	-2.629906	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOG_INC,3)

Method: Least Squares

Date: 06/01/18 Time: 11:04

Sample (adjusted): 1992 2017

Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG_INC(-1),2)	-1.866988	0.327005	-5.709360	0.0000
D(LOG_INC(-1),3)	0.328569	0.195201	1.683230	0.1059
C	0.000491	0.001566	0.313784	0.7565

R-squared	0.738838	Mean dependent var	-0.000268
Adjusted R-squared	0.716128	S.D. dependent var	0.014917
S.E. of regression	0.007948	Akaike info criterion	-6.723647
Sum squared resid	0.001453	Schwarz criterion	-6.578482
Log likelihood	90.40741	Hannan-Quinn criter.	-6.681844
F-statistic	32.53395	Durbin-Watson stat	2.013035
Prob(F-statistic)	0.000000		

Null Hypothesis: D(LOG_LEP) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.749312	0.0003
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOG_LEP,2)

Method: Least Squares

Date: 06/01/18 Time: 11:01

Sample (adjusted): 1990 2017

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG_LEP(-1))	-1.133773	0.197202	-5.749312	0.0000
C	0.002094	0.001352	1.548642	0.1340
@TREND("1988")	-5.68E-05	7.55E-05	-0.751671	0.4593

R-squared	0.569724	Mean dependent var	0.000000
Adjusted R-squared	0.535302	S.D. dependent var	0.004714
S.E. of regression	0.003214	Akaike info criterion	-8.541952
Sum squared resid	0.000258	Schwarz criterion	-8.399216
Log likelihood	122.5873	Hannan-Quinn criter.	-8.498316
F-statistic	16.55115	Durbin-Watson stat	2.055118
Prob(F-statistic)	0.000026		