# MACRO LEVEL DETERMINANTS OF LIFE INSURANCE PURCHASING DEMAND IN ETHIOPIA

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## Abstract

*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, the life insurance business has been experienced low level of development in Ethiopia. This study aims to examine the macro level variables influencing life insurance policy purchasing demand in Ethiopia. It employs secondary data on seven independent variables for a period of 15 years from 2000/2001 to 2014/2015. The collected data were analyzed with multiple regression analysis by using SPSS version 16.0. 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 inflation, price of life insurance and age dependency ratio have statistically noticeable negative impact on the life insurance policy purchasing in Ethiopia. Results also show that the literacy rate, per capita income, life expectancy and financial development have statistically significant positive influence on life insurance demand in Ethiopia. Hence, it is recommended that a high consideration of revising insurance price decisions and developing best pricing strategies, provision of insurance education for all, reduce the dependents by creating more employment opportunities, promote health extension services to increase life expectancy, and build financially developed country in turn increase the per capita income of individuals are advisable to insurers, the policy makers of the central bank, the marketing directors of life insurance companies and government officials.*

**Key words:** demographic factors, Ethiopia, life insurance, macroeconomic variables, purchasing demand.

## INTRODUCTION

Insurance is one of the key tools in modern life which has a great role in reducing risks and providing financial and mental security and finally it can broaden for countries economic development (Derakhshideh & Jalaee, 2014). Similarly, Razak et al. (2014) described Insurance as an invention intended to offer security to people and industries against particular eventualities. It also enables the parties involved to have protection of their assets and livelihood. Individual and a group of people now have the assurance in cases of injuries, damages and untimely deaths of the principal earner. Thus, insurance firms as financial intermediaries play a significant role within a nation's financial system by mobilizing funds from the surplus economic unit and channeling it to the deficit investment unit of the economy (Suleiman, 2015).

An aspect of the insurance business is the life insurance. These companies provide for citizens and the entire nation at large with varieties of key financial services. They play a crucial role in supporting investments by accommodating all life insurable risks and financial consequences. They provide benefits to households upon a person's death or disability in exchange for the premium paid, to benefitting the beneficiaries in the future (Suleiman, 2015). Thus, the main reason for the purchase of life insurance is to provide financial security for the family (Razak et al. 2014). Life insurance is now seen as a major way of raising funds for investment, and it also encourages capital market growth. In addition, life insurance industries have taken steps to ensure risk management by individuals and families (Beck and Webb, 2003).

The Ethiopian insurance industry does not have a long history of development despite the country's long history of civilization. It is among the lowest in the world and African countries in terms of the three measures namely: Insurance premium market share, market penetration rate and insurance density (insurance premium per capita). Insurance companies' investment activities are heavily constrained by the restrictions that the National bank of Ethiopia investment proclamation imposed. This forces insurance companies to invest the majority of their funds in government securities and bank deposits at negative real interest rates. The lack of infrastructure, especially a stock market, further constrains insurance companies' investment activities (Mezgebe 2010). Ethiopia's insurance industry is relatively undeveloped which is exemplified by the sectors low penetration levels .There are an estimated of 0.3 million formal insurance clients in Ethiopia. According to NBE (2015), there are 17 insurance companies in operation of which one, the Ethiopian Insurance Corporation (EIC), is state-owned while the rest 16 are private. And out of the 17 insurance companies, only nine provide life insurance.

Numerous researchers had reported that a particular economic environment and variables have profound effects on the life insurance market (Sen, 2008; Li and Moshirian, 2007; Lim and Haberman, 2004; Beck and Webb, 2003) and several others. Their submission was based on the investigation of the effect of demography and macroeconomic parameters on the life insurance market in Asia, OECD and several other developing nations. In the case of Ethiopia, as in most

developing countries, the insurance sector, and specifically life insurance is small and underdeveloped (Suleiman, 2015).

The study of the demand for life insurance has attracted the interest of a number of researchers in the past (Headen and Lee, 1974; Anderson and Nevin, 1975; Moffet, 1979; Robertson, 1982; Lewis, 1989; Truett and Truett, 1990) but only a small number of studies are devoted to examining the impact of macro level factors on life insurance demand (Cargill and Troxel, 1979; Babbel, 1985; Browne and Kim, 1993; Outreville, 1996; Hau, 2000). Some Studies are conducted on the general insurance business in Ethiopia include Abdurrahman (2006), and Zeleke (2007). However, it appears that no study has been conducted on economic and demographic determinants of the life insurance demand in Ethiopian context, except for one recent study on life insurance market in Ethiopia conducted by Suleiman (2015).

Based on the scenario mentioned above, this study is undertaken to examine the demand for life insurance policy from a macro level perspective in the context of Ethiopia. The current study is different from the study of Suleiman (2015) in the following three aspects: the demand for life insurance in this study is defined in terms of the amount of sums insured but the study of Suleiman (2015) adopted the market density as a representation for life insurance demand; the impact of the two basic macro level variables examined in this study (i.e.   Age dependency ratio and adult literacy rate) is not studied by Suleiman (2015); and the periods covered in this study are from 2000-2014 but the study of Suleiman (2015) covered the period 1979-2007. This paper proceeds to examine the macroeconomic and demographic factors affecting the demand for life insurance.

## STATEMENT OF THE PROBLEM

Data provided by Smith and Chamberlain (2010) revealed that the insurance sector's contribution in Ethiopia during the 2006/07 fiscal year was US$105 million. When this is compared to the Gross Domestic Product (GDP) of the country, it amounts to about 0.2 percent. A breakdown of the above value showed that life insurance premiums constituted only US$6 million or 6 percent of total premiums, while general insurance premiums totaled US$99 million or 94 percent of total premiums (Smith and Chamberlain, 2010). This is relatively small because life insurance policies encourage both public and private savings and investment in the long-run (Beck and Web, 2003). 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).

This shows that life insurance business impact on the nation's economy as compared to other

African countries is small and declining which calls for serious attention. The level of the insurance sector can be said to be in its emergent stage. There may be some factors that have affected the growth of the insurance market, particularly the life insurance demand in Ethiopia which requires an investigation.

In the world and Africa, the paid premium rate of life insurance is higher than the property insurance. However, in the Ethiopian context, the share of life insurance policies from the total issued insurance policies is still not more than 6%, which is very small fraction in comparing 60% of South Africa and India (WB, 2014).   The low contribution of life insurance business to the economy in Ethiopia and the absence of empirical studies concerning factors affecting the life insurance policy purchasing demand is then what motivated the researcher to put his own contribution on what macro level factors determine the demand for life insurance.   Hence, the major aim of this study is to investigate the impact of economic and demographic factors on the life insurance purchasing demand in Ethiopia. Generally, the following research question is addressed in this study:

What are the macroeconomic and demographic factors dominantly and significantly affect the demand for purchasing life insurance policies in Ethiopia?

## OBJECTIVES OF THE STUDY

The main objective of this study is to examine macro level economic and demographic determinants of life Insurance policy purchasing demand in Ethiopia. Based on this general objective, the researcher addressed the following specific objective:

To examine the effect of inflation, age dependency ratio, adult literacy rate, price of life insurance, life expectancy, financial development and income per capita on the life Insurance policy purchasing demand in Ethiopia

## THEORETICAL REVIEW OF LIFE INSURANCE DEMAND

There is no unique and integrated theory for life insurance demand. According to Outreville (1996), almost all the theoretical works on the demand for life insurance have related their work to the study of Yari (1965) which considered the demand for life insurance within the lifetime allocation process of an individual. In his life-cycle approach, Yaari (1965) explicitly considers the **uncertainty about lifetimes**. He shows that, given the uncertainty about the time of the individual's death and the desire to leave an adequate income for dependants (spouse or children), buying a life insurance policy enhances the lifetime utility.

Breadwinner demand for life insurance depends on the number of family members. Lewis has considered this relation by expanding theoretical construction of Yari life insurance and also by considering other members of family's preferences. In this mode, the life insurance is demanded by members who are under dependent person that bread winner is facing to income non-confidence lifetime. His demand for life insurance based on the lifetime of breadwinner of

the family, is based on the life cycle model in which income is non-confidence (Frank D Lewis 1989).Most of new theoretical studies on the life insurance demand have chosen Yari studies as a starting point (Hakansson (1969) and Fischer (1973). In the meaning of life cycle model with non-confidence lifetime, Yari shows that a person increases his expected utility by purchasing life insurance and receiving annual. Lewis method is distinctive because he considers the life insurance demand from heir's point of view. In order word, life insurance is demanded for maximizing expectation utility of heirs. In Yari's model structure one consumer buys life insurance to increase the expected utility of own lifetime.

## EMPIRICAL REVIEWS ON DETERMINANTS OF LIFE INSURANCE DEMAND

A number of different models on life insurance demand have been developed and tested empirically in the past with different countries. Browne and Kim (1993) examine the factors that influence the demand for life insurance across 45 countries spread throughout the world which include the under-developed and developed nations. Outreville (1996) has studied 48 developing countries to investigate empirically the relationships between the development of life insurance sector and the level of financial development and market structure of insurance institutions. In a comparative study, Truett and Truett (1990) examine the factors affecting life insurance demand in Mexico and the US. Other related studies on life insurance demand on a single country basis comprise those that relate life insurance demand with financial development and market structure (Headen and Lee, 1974), household characteristics (Anderson and Nevin, 1975; Cargill and Troxel, 1979; Lewis 1989; Hau, 2000), price expectations (Cargill and Troxel, 1979; Babbel, 1985). A study directly associated the macroeconomic variables with the demand for life insurance has been conducted by Rubayah and Zaidi (2000).

Kjosevski (2012) tried to identify determinants of the demand of life insurance in 14 countries in Central and South- Eastern Europe (CSEE). Results of this study show that higher, GDP per capita, inflation, health expenditure, level of education and rule of law are the most robust predictors of the use of life insurance. Real interest rates, ratio of quasi-money, young dependency ratio, old dependency ratio control of corruption and government effectiveness do not appear to be robustly associated with life insurance demand. Celik & Kayali (2009) investigated the determinants of demand for life insurance in cross section of 31 European countries and they found that income is the central variable which affects life insurance consumption. In addition, while the impact of population and income on demand for life insurance is positive, education level and inflation affect life insurance consumption.

Dragos (2014) concluded that Urbanization, incomes and their distributions, and the population degree of education are relevant factors for the development of insurance sector. This study estimates the different effects of the previously mentioned factors for life and non-life sector. We used the econometrics of panel data on 17 emerging economies from Asia and Europe over a

10-year period. We showed that urbanisation influenced significantly the life insurance demand in Asia, but not in Europe. Also, education was found to be significant only for the non-life sector in both regions and income was insignificant in Asia for non-life sector. The study of Nesterova (2008) identify and investigate the impact of the determinants of life insurance demand in Ukraine and several other countries of the region, both CEE and CIS. Using panel data analysis techniques for 14 countries over the period 1996-2006, found that countries with higher life expectancy at birth, income level, old dependency ratio and countries-members of the European Union have higher levels of life insurance consumption, while financial development indicator, inflation and real interest rate reduce the demand for life insurance across countries.

The major macroeconomic & demographic factors investigated in many previous studies are highlighted and discussed in brief below.

### Financial Development

Outreville (1996) tested the relationship between financial development (certain scholars describe as financial depth) and the life insurance market in developing countries. Two different proxies have been used as a measurement for financial development. The first one is the ratio of quasi-money (M2-M1) to broad money (M2). This is an indicator for the complexity of financial structure. The second one is the broad definition of money (M2). It is an average value over four years. M2 is regarded as an adequate measure for the financial development in developing countries because banking is the predominant sector in the financial market of developing countries.  The findings of Outreville (1996) indicate that the level of financial development directly affects the development of life insurance sector. However, the findings are not statistically significant. Similarly, Lim and Haberman (2004) did an assessment of the impact of a set of the demographic and economic parameters on the purchase of a life insurance in Malaysia. They found that financial growth (depth) has a direct influence on the performance of life insurance market.

### Income per capita

The income variable in the study of Cargill and Troxel (1979) refers to the normalized disposable personal income. It is the disposable personal income divided by the total household net worth. Rubayah and Zaidi (2000) examine two types of income variable in their study, namely GDP and income per capita. Income per capita is defined as the GDP divided by the size of the population. A number of studies have confirmed that income level has positive and significant influence on the demand for life insurance. This includes: Ayaliew (2013), Lim and Moshirian (2007), Beck and Webb (2003), Rubayah and Zaidi (2000), Outreville (1996), Babble (1985), and Truett and Truett (1990). In addition, the findings of Cargill and Troxel (1979), Fortune (1973), Campbell (1980), Beenstock, Dickinson, Khajuria (1986), Mantis and Farmer, 1968; Browne and Kim, 1993; Lewis (1989), Outreville (1996), Derakhshideh & Jalaee, 2014 & Ward and Zurbruegg (2000).

However, Lim and Haberman (2004), based on the study conducted in Malaysia, suggested that income was not a key factor in explaining the demand in life insurance market.

## Inflation

The findings of Browne and Kim (1993) and Outreville (1996) reveal that inflation has a significant negative relationship with life insurance demand. Inflation has a dampening effect on the demand for life insurance. High inflation tends to cause the purchasing of life insurance to be less attractive because of the rising cost of living. The negative impact of inflation had also been widely documented in previous researchers (Beck and Webb, 2002; Ward and Zurbruegg, 2002; Li et al., 2007; Ayaliew, 2013; Li and Moshirian, 2007; Babbel, 1981; Derakhshideh & Jalaee, 2014). However, the findings of Cargill and Troxel (1979) and Rubayah and Zaidi (2000) are not in line with the findings of Browne and Kim (1993) and Outreville (1996). Further, the findings of Rubayah and Zaidi (2000) show an insignificant positive relationship between inflation rates and the demand for life insurance.

## Price 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 various insurance price indices in the study of Babbel (1985) are the net present cost per 1000 present-valued unit of insurance expected to be in force over any arbitrary time horizon selected based on the published policy values for a male of age 35. Specifically, the price index refers to the ratio of the present value of expected premium cost, net of dividends and accumulations of cash values, per 1000 present-valued unit of indemnification benefits expected to be received, in excess of the actuarially fair cost. Two different discount rates, namely the yields of 10-year prime grade municipal bonds and double-A-rated corporate bonds, are used to discount the expected future cash flows from the policies. Browne and Kim (1993) use the policy loading charge as the price measure. It is the ratio of the life insurance premiums to the amount of insurance in force. In fact, it is the cost per dollar of life insurance coverage. This finding of Outreville (1996) indirectly verifies the finding of Browne and Kim (1993) that the price of insurance is inversely related to the demand for life insurance.

## Life Expectancy

Life expectancy at birth is the average time span a human has before death, calculated from the time of birth.   In the study of Browne and Kim (1993), average life expectancy is found to be an insignificant factor affecting the demand for life insurance. However, the life expectancy at birth in the study of Outreville (1996) has found a significant positive relationship between life

expectancy at birth and demand for life insurance. The positive relationship between life expectancy at birth and the demand for life insurance implies that populations with a longer life span tend to buy life insurance policies. Similarly, Beck and Webb (2003) found that life insurance market and a higher life expectancy are directly correlated. This result implied that optimism about long life encourages and improves the sale of life policies. But on the other hand, following Lewis (1989) life insurance consumption increases with the policy holder's probability of death. Giving that life expectancy is inversely related to death probability the expected relationship between demand and life expectancy is ambiguous.

## Adult Literacy Rate

Better literacy and educational level definitely have a positive impact on the health parameters. Literacy rate is given its due importance in this paper as a key to prosperity (Desai, 2012). A study of Derakhshideh & Jalaee (2014), to estimate the demanding life insurance and analysis effective factors on it results there is insignificant relationship between the variable of literacy rate and the life insurance demand. However, other previous studies found that there is statistically significant and positive relationship between literacy rate and demand for life insurance (Burnett and Palmer, 1984; Truett and Truett, 1990). The literacy rate as a proxy of education positively affects the demand for life insurance for several reasons and argues that a higher level of ability to write, read and understanding is associated with a stronger desire to protect dependents and safeguard their standard of living. Browne and Kim (1993) explain that a higher level of education is a good proxy to measure the risk aversion. Outreville (1996) also supports the view expressed by Browne and Kim (1993). To better understand insurance consumption, the degree of risk aversion is an important determinant (Zietz, 2003). The reasoning for such a statement is that higher level of education increases the ability of a person to understand the importance and benefits of savings through life insurance and protection against mortality risk (Beck and Webb, 2002).
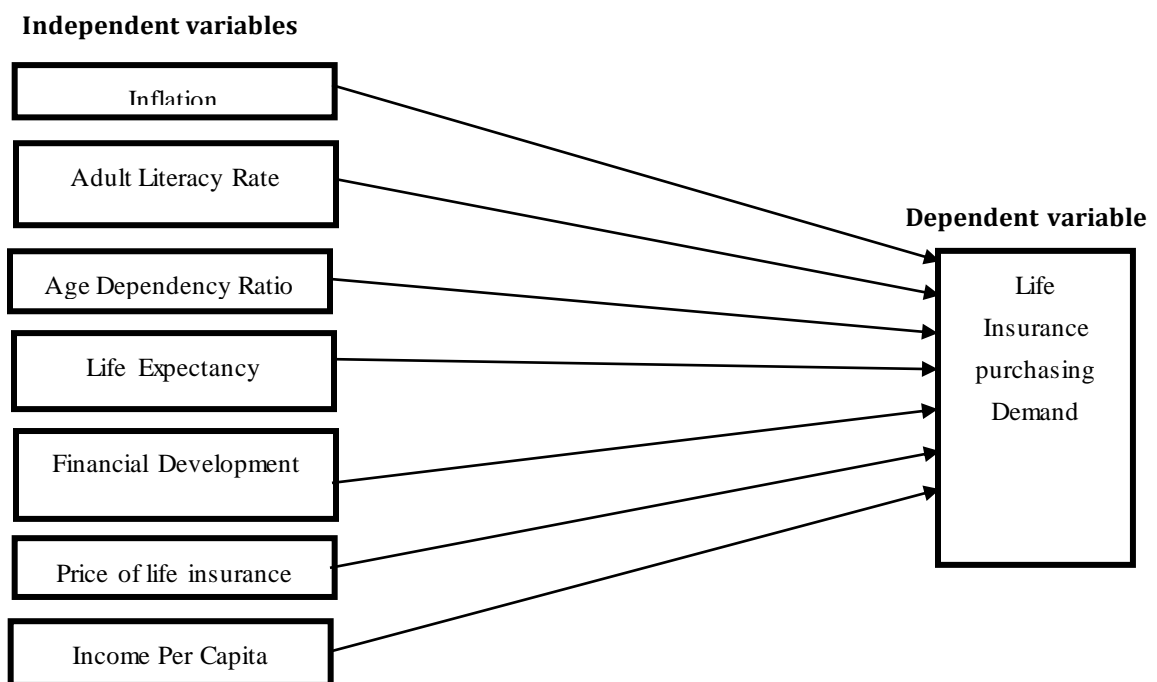
## Age Dependency Ratio

Age dependency ratio is the ratio of dependents--people younger than 15 or older than 64--to the working-age population--those ages 15-64 (World Bank, 2015). Most studies use this definition of dependency ratio (Truett et al., 1990, Browne and Kim, 1993; Li and Moshirian, 2007). Dependency ratio shows the structure of the household in terms of a number of people, dependent on the main source of income. A direct relationship exists between life insurance consumption and dependants' life time. Hence, the life policy is required to provide for the survivors at the death of the policy holders (Beck and Webb, 2003). A statistically significant direct association exists between age dependency ratio and life insurance demand (Browne and Kim, 1993; Li and Moshirian, 2007). However, age dependency ratio had an insignificant impact on life insurance purchasing demand (Sen, 2008). Lewis (1989), who developed the life-time

utility framework including the preferences of the dependent members of family, found a positive relationship between life insurance demand and dependency ratio. Truett and Truett (1990) confirm the positive impact of age dependency ratio, while Beck and Webb (2002) do not find age dependency to be a robust determinant of life insurance demand. Campbell (1980) and Burnett and Palmer (1984) argue that the protection of dependents against financial hardships is the major force driving life insurance consumption.

## RESEARCH MODEL

The following general research model is constructed in order to test the effect of these variables on the demand for life insurance in Ethiopian context



**Independent variables**

- Inflation
- Adult Literacy Rate
- Age Dependency Ratio
- Life Expectancy
- Financial Development
- Price of life insurance
- Income Per Capita

**Dependent variable**

Life Insurance purchasing Demand

## RESEARCH DESIGN AND DATA SOURCES

In achieving the objectives and obtaining answers for research questions, the study adopted quantitative research approach. This approach involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion (Kothari, 2004). In other words, Quantitative research involves studies that make use of statistical analyses to obtain their findings (Geoffrey, David & David, 2005).  The data for this study consist of annual aggregate data from 2000/01 to 2014/15. All data in this study are secondary in nature. The data for macroeconomic and demographic variables and relating to demand for life insurance were sourced from the World Bank Reports, National Bank of Ethiopia (NBE), Birritu, Ethiopia Insurance Corporation (EIC), Ministry of Finance and Economic Development (MOFED), Ethiopian central statistics agency (CSA), and Financial Statements and Accounts of Insurance Companies.

## Variables and their Measurement

| Variable | Measurement |
|---|---|
| Demand          for | the percentage calculated as the ratio of the new sums insured in a year to |
| Financial | The value of broad definition of money (M2) |
| Income per capita | the amount of income calculated as the GDP at market price divided by |
| Inflation | The rate of change in the price index |
| Price     of     life | The ratio of the total annual premium in force to the total sums insured in |
| Life Expectancy | The average number of years of life since birth, if they continue to be |
| Adult Literacy Rate | The percentage of people who can read, write and understanding |
| Age     Dependency | The ratio of dependents--people younger than 15 and older than 64--to |
| Ratio | the working-age population--those ages 15-64. |

## DATA ANALYSIS

The collected data for the research can be analyzed through various analysis techniques. As previous literatures indicated that correlation analysis and regression analysis techniques can be applied to studies with time series evidence to investigate factors affect the demand for life insurance. This research used SPSS version 16.0 for multiple regression analysis. Hence, in this study, correlation analysis and a multiple regression analysis were performed by using all the variables (dependant and independent) available in the dataset and entered in SPSS software package.

## MODEL SPECIFICATION

By structuring the model in an appropriate way, we can remove the impact of certain forms of omitted variables bias in regression results. As discussed in the literature review in this study, a framework was designed based on the review of previous empirical studies. After summarizing previous studies, the model for this study was specified following theoretical and empirical foundations. The model is 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:

$$LIDD_t = \beta_0 + \beta_1 FDT_t + \beta_2 LEP_t - \beta_3 INF_t - \beta_4 PLI_t + \beta_5 IPC_t + \beta_6 ALR_t - \beta_7 ADR_t + \varepsilon_t$$

LIDD= Life Insurance Purchasing Demand, FDT= Financial development, LEP= Life expectancy, INF=Inflation, PLI=Price of life insurance, IPC= Income per capital, ALR=Adult literacy rate, ADR= Age dependency ratio and $\varepsilon$ is the error term for company i at time t assumed to have mean zero E $[\varepsilon_{it}] = 0$. $\beta_0$ is the constant value of the regression surface. $\beta_{1, 2, 3, .....,7}$ are parameters to be estimated and t = 1, . . . , 15.

## TRANSFORMATION OF VARIABLE

The necessity to transform a variable depends on its value. A transformation is made on

variables of level-value; however, variables of rate-value are not transformed because they are already in a preferred form as they are a measure of change. Based on this rationale, the variables of financial development (FDT), income per capita (IPC), the price of life insurance (PLI) and life expectancy at birth for males (LEP) are subject to transformation by taking the natural logarithm of their level values. The transformed variables are named as LNFDT, LNIPC, LNPLI and LNLEP. Hence forth, the transformed variables are used in the analysis. Clearly, the transformed variables are monotonic functions of the underlying variables.

### TESTS OF ORDINARY LEAST SQUARE ASSUMPTIONS

According to Gujarati (2004), before running regression analysis, it is necessary to assess whether the collected data violate some key assumptions of regression.

The data were checked to verify that the assumption of multivariate normality was met. The bell-shape of the histogram and the normal probability plots indicated that residuals from the research model regression are normally distributed. Therefore, the normality assumption is fulfilled and the presumption that the researcher will made about the population parameter from the sample is suitable.

White's Hetroskedasticity Test with no cross term is used to investigate the presence of Hetroskedasticity in the variance of the residuals of the final estimation regression. The P-value for the F-statistic and the significance level of 5% are used to make a decision on the hypothesis. If the P-value for the F-statistic exceeds the significance level, we may conclude that Hetroskedasticity is not present in the variance of the residuals. The P-value for the F-statistic for this study is 0.000 which is less than the significance level of 5% as shown (in table 4.4). Therefore, there is no the problem of Hetroskedasticity.

Multicolinearity is mostly tested with variance inflating factor (VIF) and tolerance statistics produced from a regression statistics. The VIF indicates whether a predictor has strong linear relationship with the other predictor(s). Some authors therefore use the VIF as an indicator of Multicolinearity. The larger the value of VIF, is the more troublesome or collinear the variable. As a rule of thumb, any variables with a value above 10.0 of VIF would have a correlation of more than 0.90 with other variables, indicative of the Multicolinearity problem (Hair et al. 1998).

Related to the VIF is the tolerance statistics, which is the reciprocal of VIF. An insignificant tolerance value indicates that the variable under consideration is almost a perfect linear combination of the independent variables already in the equation and that it should not be included to the regression equation. Tolerance ranges from zero to one. Any variables with a tolerance value below 0.10 or the closer the tolerance value to zero indicates a level of Multicolinearity. On the other hand, the closer Tolerance is to 1, the greater the evidence that a variable is not collinear with the other repressor (Guajarati, 2004). Considering the regression analysis for this study, regression results (as indicated in table 4.5) shows that Tolerance for all independent variables is more than 0.10 and Variance Inflation Factor- VIF for the independent

variables is less than the limited value, 10.0. As a result we can say that there is no Multicolinearity between the independent variables.

For any two observations the residual terms should be uncorrelated. This eventually is sometimes described as a lack of autocorrelation. This assumption was tested with the Durbin-Watson d statistics which tests for serial correlation between errors. This is the most celebrated test for detecting correlation developed by statisticians Durbin and Watson. The test statistics for this can vary between 0 and 4 with the value of 2 meaning that the residuals are uncorrelated. A great advantage of the d statistic is that it is based on the estimated residuals, which are routinely computed in regression analysis. Because of this advantage, it is now a common practice to report the Durbin–Watson d along with summary measures, such as R square, adjusted R square, t, and F. If there is no serial correlation; d is expected to be about 2. Therefore, as a rule of thumb, if d is found to be 2 in an application, one may assume that there is no autocorrelation, either positive or negative (Guajarati, 2004).   From the regression results in the model of this study, as shown (in table 4.3), the value of the test is closer to 2 (2.085), so, it can be safely assumed that there is no problem of autocorrelation.

### CORRELATION ANALYSIS

The primary objective of correlation analysis is to measure the strength or degree of linear association between two variables. The correlation coefficient measures this strength of (linear) association. It is a measure of linear association or linear dependence only; it has no meaning for describing nonlinear relations (Guajarati 2004). To determine the relationship between the independent variables and the dependent variable, Pearson correlation was computed. The following table shows the correlation between the variables for the study:

**Table 4.2:- Pearson Correlations table**

| Variables | ADR | ALR | INF | LNFDT | LNPLI | LNLEP | LNIPC | LIDD |
|---|---|---|---|---|---|---|---|---|
| ADR | 1.0000 | | | | | | | |
| ALR | -.709** | 1.0000 | | | | | | |
| INF | .019 | -.074* | 1.0000 | | | | | |
| LNFDT | -.667** | .325* | .134 | 1.0000 | | | | |
| LNPLI | -.272 | .237** | -.142 | -.420** | 1.0000 | | | |
| LNLEP | -.125* | -.057* | -.066 | .128* | -.175* | 1.0000 | | |
| LNIPC | -.219** | .041 | .267** | .333** | -.126 | .259** | 1.0000 | |
| LIDD | -.559** | .622* | -.281* | .409** | -.020* | .159** | .194* | 1.0000 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.2 shows us correlations between LIDD and independent variables. As it shown in the correlation matrix, each variable is perfectly positively correlated with itself and so r=1 along the diagonal of the table. The coefficient estimates of correlation for age dependency ratio, inflation and price of insurance shows that these variables are negatively correlated with the demand for purchasing life insurance. The correlation matrix also shows that adult literacy rate, financial development, life expectancy and income per capita are positively correlated with the demand for purchasing life insurance. There is a positive and relatively strong linear association (62%) between literacy rates as a percentage of educated people and the demand for purchasing life insurance. there is also a negative and relatively strong linear association (56%) between age dependency ratio and the demand for purchasing life insurance. The analysis also indicates that several independent variables are correlated with each other.

**MULTIPLE REGRESSION ANALYSIS**

To determine the influence of explanatory variables on the dependant variable, multiple regression analysis is employed for the study. Tables 4.3, 4.4 1nd 4.5 present the results from the regression analysis carried out using the seven explanatory variables. This was done to determine the best linear combination of independent variables for predicting the life insurance policy purchasing demand in Ethiopia.

**Table 4.3. Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .875[a] | .766 | .663 | 21.05029 | 2.085 |

a. Predictors: (Constant), LNLEP, INF , LNPLI, LNIPC, ALR, LNFDT, ADR

b. Dependent Variable: Life Insurance Purchasing Demand

**Table 4.4. ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 23157.906 | 7 | 3308.272 | 7.466 | .000[a] |
| | Residual | 7089.839 | 16 | 443.115 | | |
| | Total | 30247.744 | 23 | | | |

a. Predictors: (Constant), LNLEP, INF , LNPLI, LNIPC, ALR, LNFDT, ADR

b. Dependent Variable: Life Insurance Purchasing Demand

### Table 4.5. Coefficients[a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | 200.407 | 89.395 | | 2.242 | .039 | | |
| | ALR | .2.921 | 1.387 | .429 | 2.107 | .045 | .614 | 1.630 |
| | LNIPC | 18.679 | 4.915 | .506 | 3.800 | .001 | .765 | 1.307 |
| | LNPLI | -4.686 | 1.329 | -.418 | -3.525 | .003 | .831 | 1.203 |
| | INF | -1.721 | .463 | -.529 | -3.716 | .000 | .722 | 1.384 |
| | ADR | -.87.306 | 95.019 | -.152 | -.919 | .032 | .816 | 1.226 |
| | LNFDT | .198 | 1.232 | .037 | 0.161 | .019 | .694 | 1.440 |
| | LNLEP | 49.656 | 292.212 | .093 | .170 | .006 | .851 | 1.175 |

a. Dependent Variable: Life Insurance Purchasing Demand

From table 4.3, it can be seen that the R-square shows that 76.6% of variations in dependant variable (LIDD) are explained by the variations in the independent variables included in the model. It is also noted from the regression result in table 4.3 is that the adjusted R square in the model is 0.663. This indicates the model is the best to explain the Life Insurance Purchasing Demand in Ethiopia. Which means on average 66.3 % of the change in Life Insurance Purchasing Demand can be explained by the variables in the model. Therefore, the model is significant.

Table 4.5 showed the standardized beta coefficients. A unit change in the independent variables would produce an effect on the dependent variable. From this table, inflation ($\beta$=-0.529, $p<0.01$), price of insurance ($\beta$=-0.418, $p<0.01$) and age dependency ratio ($\beta$=-0.152, $p<0.05$) had a negative and significant influence on life insurance purchasing demand. The results of the regression analysis also shows that adult literacy rate ($\beta$=0.429, $p<0.05$), income per capita ($\beta$=0.506, $p<0.01$), financial development ($\beta$=0.037, $p<0.05$) and life expectancy ($\beta$=0.093, $p<0.01$) had positive and significant influence on life insurance purchasing demand.

### FINDINGS AND DISCUSSION

The result discussion below is sorted on the basis of the independent variables. After analyzing the data, major determinants of life insurance policy purchasing demand in Ethiopia are identified and presented here under against the ones found in other empirical studies.

### Inflation

The results of the multiple regression analysis show that inflation has a negative and statistically significant influence on life insurance purchase demand in Ethiopia with a regression coefficient

of -0.529 and p-value of 0.000. This is consistent with many empirical studies (Browne and Kim, 1993; Outreville, 1996; Cargill and Troxel, 1979; Babbel, 1981; Browne and Kim, 1993; Li et al., 2007;  Beck and Webb, 2002; Ward and Zurbruegg, 2002; Ayaliew, 2013; Li and Moshirian, 2007; Derakhshideh & Jalaee, 2014). However, the findings of Rubayah and Zaidi (2000) are not in line with this finding that shows an insignificant positive relationship between inflation rates and the demand for life insurance.

### Income per capita

The results of the multiple regression analysis show that income per capita has a positive and statistically significant influence on life insurance purchase demand in Ethiopia with a regression coefficient of 0.506 and p-value of 0.001. This is consistent with many empirical studies (Cargill and Troxel, 1979; Rubayah and Zaidi, 2000; Ayaliew, 2013; Lim and Moshirian, 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 and Derakhshideh & Jalaee, 2014). However, Lim and Haberman (2004), 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.

### Adult Literacy Rate

The results of the multiple regression analysis show that adult literacy rate has a positive and statistically significant influence on life insurance purchase demand in Ethiopia with a regression coefficient of 0.429 and p-value of 0.045. This is consistent with many empirical studies (Desai, 2012; Burnett and Palmer, 1984; Truett and Truett, 1990; Browne and Kim,1993; Outreville, 1996; and Zietz, 2003). In contrary, Derakhshideh & Jalaee, 2014 & Beck and Webb, 2002), found insignificant relationship between the variable of literacy rate and the life insurance demand.

### Price of life Insurance

The results of the multiple regression analysis show that price of life insurance has   inversely and statistically significant influence on life insurance purchase demand in Ethiopia with a regression coefficient of -0.418 and p-value of 0.003. This is consistent with studies of (Babbel, 1985; & Browne and Kim, 1993). However, this is not consistence with the finding of Outreville (1996).

### Age Dependency Ratio

The results of the multiple regression analysis show that age dependency ratio has inversely and statistically significant influence on life insurance purchase demand in Ethiopia with a regression coefficient of -0.152 and p-value of 0.032. This is consistent with studies of (Beck and

Webb, 2003; and Sulaiman et.al, 2015). In contrary, other studies show a statistically significant direct association exists between age dependency ratio and life insurance demand (Browne and Kim, 1993; Li and Moshirian, 2007; Lewis, 1989; Truett and Truett, 1990; Campbell, 1980 and Burnett and Palmer, 1984). On the other hand, (Beck and Webb, 2002 and Sen, 2008) shown that age dependency ratio had an insignificant impact on life insurance purchasing demand.

### Life Expectancy

The results of the multiple regression analysis show that life expectancy has a positive and statistically significant influence on life insurance purchase demand in Ethiopia with a regression coefficient of 0.093 and p-value of 0.006. This is consistent with studies of (Outreville, 1996; & Beck and Webb, 2003). 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 Development

The results of the multiple regression analysis show that life expectancy has a positive and statistically significant influence on life insurance purchase demand in Ethiopia with a regression coefficient of 0.037 and p-value of 0.019. This is consistent with studies of (Outreville, 1996 & Lim and Haberman, 2004). However, the finding of Outreville (1996) was not statistically significant.

## CONCLUSIONS

The findings of this study indicate that inflation, the price of life insurance and age dependency ratio negatively influence the purchasing demand for life insurance policy in Ethiopia. A change in these variables has a significant negative relationship with the demand for life insurance. The study also show that income per capita, adult literacy rate, life expectancy and financial development have positive and statistically significant influence on the purchasing 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, inflation and income per capita are the most influential macro-economic factors followed by adult literacy rate (among the macro demographic factors) and price of life insurance.

## RECOMMENDATIONS

The life insurance sector in Ethiopia needs more effort on its development and to have relatively high demand by the society over the years. Based on the major findings obtained from the study, the researcher provided the following recommendations:

**Meet the two objectives of monetary policy**: price stability and full employment. Despite of progresses in the reduction of inflation by the government, still it requires a great deal towards creating stable prices of goods and services. Once the inflation is controlled and be at lower limit, individuals may tend to invest in insurance by purchasing life insurance policies. Full employment reduces the economic burden of the total age dependents. Though many studies of developed nations show age dependency ratio as a good indicator for increasing the demand for life insurance, it has a negative impact for our context. This is because of low per capital income. Even if the government tried to create more job opportunities, still there is dependency on the productive forces. So, attention should be given to enhance full employment so as to reduce number of dependents.

**Flexible pricing strategy for life insurance products**: At the time of high inflation, individual households might refrain from purchasing life insurance policies. The insurance companies need to be flexible to life insurance product price decisions during high inflation, since it affects the life insurance demand of individuals. A small percentage reduction in the price change would help to increase the demand for life insurance. This finding has an important implication on policy formulation for the policy makers and the marketing directors of life insurance companies.   This is because inflation affects the value of money and the general price level in the economy. Therefore, it reduces the willingness to purchase life policy because it will be expensive for an average household.

**Insurance education for all:** It is worthwhile to have high consideration of incorporating the risk management and insurance course in all levels of curriculum. Because the literacy rate as a measure of understanding insurance is important factor influences the life insurance demand positively. When individuals' level of understanding about insurance in particular and their level of education in general increase, risk aversions will be their primary concern. To this end, individuals should aware of risk and insurance. Therefore, the curriculum designers in general and insurance companies in particular should engage in insurance education.

**Enhancing economic growth:** growth in the economy obviously increases income level of individual households and financial development of the country. This in turn contributes for the betterment of the living standards of the households. The better the living standard, the longer the life expectancy in the country also attaining. The larger is level of income per capita, the more of life insurance consumer can afford to purchase for several reasons.

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