A study of life and health insurance demand in China and the United States

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A Study of Life and Health Insurance Demand

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Content:

1 Introduction

1.1 China’s Life Insurance Market

1.2 The United States’ Life Insurance Market

1.3 Objectives

2 Literature Review

2.1 Micro Perspective of the Life Insurance Demand

2.2 Previous Empirical and Theoretical Studies on Life Insurance Demand

2.3 Macro Perspective of the Life Insurance Demand

2.4 Studies of the Life insurance Demand in Developing Countries

3 Methodology

3.1 Dependent Variable

3.2 Independent Variables

3.3 Hypotheses

3.4 Regression Models

4. Data Analysis

4.1 China

4.2 The United States

4.3 The Result of China
4.4 The Result of the United States

4.5 Comparison

5 Discussions and Recommendations

6 References

7 Appendix
1. Introduction

1.1 China’s insurance market

Within the next two decades, the growth of China’s insurance industry is anticipated to overtake that of the national economy. With per capita premium income in China currently falling behind many industrialized and some developing nations, the potential for market growth is enormous. Despite an overwhelming interest by foreign companies to move into China’s insurance industry they had, until recently, been denied access to China’s population of 1.2 billion. For virtually the last five decades, the insurance market in China was monopolized by the state-owned insurance giant- the People’s insurance Company of China (PICC). Permission to enter the Chinese insurance market was initially granted to select foreign companies as a direct result of China’s desire to enter the General Agreement on Tariffs and Trade (GATT). In 1992, China opened its insurance sector as part of an overall strategy to further develop its tertiary industry, a requirement for admission to GATT. Foreign insurance companies were welcomed into China. As of 2000, 17 foreign insurance companies had been granted permission to operate some form of insurance business in China. The majority of foreign insurance companies that wish to obtain an operating license are engaged in the life insurance business. In 1994, there was a breakthrough in the life insurance market, with 350 million
people taking out some sort of life insurance policy. With a population of 1.2 billion people, the life insurance industry is expected to continue growing at a rapid pace.

In 1980, China’s total insurance premiums came to 460 million yuan (55 million US dollars). By 2001 the figure had risen to 211 billion yuan (25 billion US dollars), an average growth rate of 34 percent, three times that of the country’s gross domestic product (GDP) in the last two decades. In December 2001, China entered the World Trade Organization (WTO). China agreed to increase market access for foreign insurers, to ease regulations for foreign insurers to invest in domestic insurers and set up joint venture insurance companies. China agreed to open up more geographical area and service sectors for foreign insurers. China’s insurance industry maintained huge growth momentum during its first full year after the WTO entry. Premium income totaled 305.3 billion yuan (US$38 billion) in 2002, up 44.7 per cent over the previous year and topping the last few years. The income from life insurance premiums rose 59.8 per cent and the overall assets of insurance companies grew 41.4 per cent over the previous year, according to the latest statistics from an annual insurance working meeting held in Beijing on January 24-26.

China’s insurance market is characterized by its small size, a limited variety of insurance products, relatively high costs, lack of Chinese consumer education about
the role of insurance, and a lack of a sound legal environment, particularly in the area of enforcement. China is still a small market in terms of insurance penetration—premiums as a percentage of gross domestic product. According to Swiss Re data, in 2001, insurance penetration for China was 2.2%, ranking it 56th among the world’s insurance markets. The potential for growth of the insurance industry in China is enormous.
1.2 The United States insurance market

The United States insurance industry is recognized by many financial rating agencies, institutional investors and economists as one the strongest in the global economy. It is a US$1 trillion business with assets of more than US$3 trillion. The United States life industry is large and diverse, with over 2000 companies providing a wide variety of services. The industry provides traditional whole life insurance, which includes a savings component through the building up of cash values, and term insurance which does not involve saving. In recent years new kinds of policies, such as universal life and variable life, have grown in importance. During the past 30 years, the United States insurance industry developed rapidly and is the largest insurance market in the world. In 1986, there were 5652 insurance companies in the US, in which 2109 were life insurance companies. In 1980, the United States’ total insurance premium was US$189.805 billion and life insurance premium was US$64.859 billion. The total insurance premium increased from US$402.2 billion in 1990 to US$826.6 in 2000. The life insurance premium grew from US$76.7 billion in 1990 to US$130.6 billion in 2000 while the health insurance premium grew from US$58.3 billion to US$105.5 billion in the same period.
1.3 Objectives

There are three main objectives of this research project.

1) By constructing two linear regression models, we will estimate the life and health insurance demand functions in China across provinces and in the U.S.A. across states. We will find out the relationship between gross insurance premiums and GDP per capita, percentage of population who are over 65, education level, average family size, rate of employment in state-owned firms (for China only), rate of urban population (for the USA only) and unemployment (for the USA only) respectively and quantitatively. In fact, price and innumerable economic, demographic, sociocultural, political, and other factors determine each economy’s consumption of life and health insurance. We are interested to find out how the factors influence life and health insurance consumption.

2) We will analysis the results of Mainland China and the USA and then compare the results of both countries to explore the insights of the difference between them, if there were any existing.

3) We will give suggestions to the Chinese insurance market. Since the insurance market of the USA is regarded as an advanced and mature market compared to the relatively immature and less-developed one of China, we will estimate or
give some suggestions to Chinese market concerning about the research outcomes of the USA.

We expected our research outcome will serve the life and health insurers operating in China in terms of helping investigate the potential market districts and prospect the potential groups.
2. LITERATURE REVIEW

2.1 Micro Perspective of the Life Insurance Demand

From micro perspective, the purchasing decision of life insurance of an individual is influenced by factors such as personal disposable income, age, gender, education level, occupation, attitude towards risk and so forth.

There are several approaches that determine whether an individual has the need for a life insurance policy. First is the Human Life Value Approach. When using this approach, we need to calculate Human life value, which is defined as the present value of the family’s share of the deceased breadwinner’s future earnings. This amount represents the insurance coverage that should be purchased in order to compensate the loss in case of premature death of a family’s breadwinner. The second one is the Need Approach, under which various family needs are analyzed, and the amount of money needed to meet these needs is determined. Then the amount of financial assets is subtracted from the total sum needed. The gap, if existing, is the coverage of life insurance policy that should be purchased. The third approach is the Capital Retention Approach. Three steps are taken when using this approach, which are first to prepare a personal balance sheet, second to determine the amount of income-producing capital, finally to determine the amount of additional capital needed.
Although these approaches may give a rational consumer accurate assessment of his/her life insurance need, practically it is impossible for everyone to use the models before considering purchasing life insurance products. Yet many people do not own life insurance policy even they do need one. Therefore there must be some other reasons that influence their life insurance purchasing decision.

2.2 Previous Empirical and Theoretical Studies on Life Insurance Demand

Various researchers have studied the distinctive or characteristic features that a life insurance policyholder has, either empirically or theoretically. Some of them utilized cross sectional data, while others used time series data.

Empirically, many studies have been undertaken to investigate the factors that affect life insurance demand. Mantise and Farmer (1968) predicted that marriages, births, personal income, population size, relative price index, and employment determine the amount of life insurance that will be sold. Other studies have also looked at the effects from interest rates, price of insurance products, and Social Security tax contributions on the amount of life insurance purchased or owned (Neumann, 1969; Headen and Lee, 1974; Kamerschen, 1979; Babbel, 1979, 1981 and 1985).

Several models of the demand for life insurance products have been developed and
tested empirically. Let’s take Yaari (1965) as a starting point of theoretical work on the demand for life insurance. Yarri points out that the demand for life insurance is properly considered within the context of the consumer’s lifetime allocation process, and shows that in the context of a life-cycle model with uncertain lifetime, that an individual increases expected utility by purchasing fair life insurance or a fair annuity. It is also assumed that each utility-maximizing household has the same degree of relative risk aversion, although some evidence indicates that inter-country differences are likely to reflect differences in the degree of relative risk aversion and therefore affect the demand for life insurance.

Following Yaari (1964, 1965) and Hakansson (1969), a demand function for life insurance derived from the maximization of the utility function of the consumer should depend on wealth, the income stream, a vector of interest rates, a vector of prices including insurance premium rates, and the consumers’ subjective discount function for the utility functions for consumption and wealth, which are affected by the level of the financial development of the market.

Moreover, Lewis (1989) extended Yaari’s model in a way that resulted in direct empirical implications. He constructed a framework in which life insurance was chosen to maximize the beneficiaries’ expected lifetime utility. The empirical estimates of his model based on U.S household-level data were encouraging.
Lewis’s model indicates that life insurance consumption increases with the wage earner’s probability of death and the present value of the family member’s consumption, assuming that the wage earner survives. Life insurance consumption also increases with the family’s degree of risk aversion. Life insurance consumption is negatively related to the policy loading charge and the family’s wealth.

2.3 Macro Perspective of the Life Insurance Demand

Scholars are not only interested in studying the micro perspective of life insurance purchasing, but also emphasizing on the macro factors that affect the aggregate demand of life insurance. An individual’s demographic features, such as age, family, and his/her income level could determine his/her insurance needs. Similarly, a group’s average age, family size, income level and educational level could have some relation with the group’s aggregate insurance demand.

A number of research papers have used this aggregate approach to forecast the insurance market scale in a county.

In “Model to Forecast Insurance Scale”, Su Fang developed two mathematics models, which describe the relationship between GDP per capita and insurance density, to forecast long-term and short-term Chinese insurance scales respectively. However, this paper only considered one independent variable --- GDP per capita,
which was suspected to have omitted variables.

Sun Qixiang indicated in his paper, ‘on the latent Demand Factors of China’s Insurance Industry Growth’, that there was a very close relationship between social and environmental factors and the demand of insurance. Those factors include aspects of demographic, family and community, which were also referred to before. Moreover, it was suggested that the aging problem in China would lead to a great demand for life insurance.

In the book “Inflation of China and Life Insurance”, Chu Junhong pointed out that variables that influence life insurance demand could be sorted to two categories—Proximate Determinants and Intermediate Determinants. A direct demand function was formed as \( Q = Q(P, Y) \), where direct variable price of life insurance products (premiums) and income determine the quantity of demand of life insurance products. Moreover, intermediate determinants consist of Fiscal policy, income distribution policy, social welfare system, inflation, interest rate, and demographical and cultural factors.

Moreover, at the macro level, Truett and Truett (1990) conclude that per capita income, age, distribution of the population, and median school years completed are factors that positively affect the demand for life insurance within families. In addition, Chen, Wong, and Lau (1998) found that the defined contribution program,
the central provident fund, has a significant negative effect on life insurance purchased in Singapore.

2.4 Studies of the Life Insurance Demand in Developing Countries

In the article “Life Insurance Markets in Developing Countries”, J. Francois Outtreville stated that demand of life insurance is not only positively related to the real disposable personal income, which is measured by per capita gross domestic product, and is theoretically related to the amount of nonhuman wealth processed by the insured, whose sign is dependent upon the shape of the risk aversion function of the insurance customer. He also hypothesized that demand for life insurance is related to real interest rate (RIR), anticipated inflation (AI), and the price of insurance (PI).

Besides, a regression model was addressed in the paper “The Demand for Life Insurance in Mexico and The United States: A Comparative Study”, which incorporated additional relevant factors, such as age and level of education. The article provided us with an estimated demand function for insurance on an aggregate basis using time series data, and the demand estimation results in this article are generally consistent with the hypothesis that age, education, and level of income are factors that affect the demand of life insurance.
\[ \text{LN}(Q_t) = \beta_0 + \beta_1 \text{LN}(A_t) + \beta_2 \text{LN}(E_t) + \beta_3 \text{LN}(Y_t) + \varepsilon_t \]

Q = the quantity demanded of insurance,

A = a variable reflecting the age of the population under study,

E = a variable reflecting the education of the population under stay,

and

Y = real per capita income in the population under study.

It points out that one apparent difference between the demand for life insurance in the United States and Mexico is that the income elasticity of demand is much higher in Mexico. Due to the similarity of the developing status between China and Mexico, it seems reasonable to believe that the impact of the same percentage of GDP/GSP growth should be much greater for China than for the United States.

A more detailed explanation of factors affecting the demand for life insurance has been provided in the article “An International Analysis of life insurance demand”.

Variations in life expectancy are hypothesized to affect the demand for insurance to the extent that life expectancy is correlated with the probability of death in a country. It suggests that national income, a country’s dependency ratio, and the portion of the young adult population pursuing third-level education would all affect the demand for insurance. Besides, the expected rate of inflation is negatively correlated with the demand for life insurance. Religion may also affect the demand
for life insurance through its effects on the degree of risk aversion in a country.

Besides, social security payments by the government may have impact on the demand for insurance as these payments represent a source of income to recipients contingent upon the wage earner’s survival. Furthermore, a time series study of demand could potentially lead to a greater knowledge of the growth and maturation of insurance markets.

In a cross sectional study, Duker (1967, p. 528) found that income, occupation, education, total assets, and age had “significant partial regression coefficients.” In a more recent study that included both psychographic as well as demographic variables, Burnett and Palmer (1984) found education, number of children, and income to be the best demographic predictors of the demand for life insurance.

From the incentive literature review on insurance demand theories and models, we come to a conclusion that so far there has been much empirical research on aggregate insurance demand (life insurance solely, liability and property insurance solely, or both), either cross countries or time serial study between two countries. However, as for China, which is considered to be the most potential insurance market in the 21st century, few empirical or aggregate insurance demand studies have been conducted while most studies are written descriptively. In addition,
there has been only limited investigation of the demand of life insurance in less
developed countries. Therefore, as far as we are concerned, it is significant to study
this topic empirically in that it shall provide explaining factors that affect life and
health insurance demand in China quantitatively.
3. Methodology

In this research, we will investigate the factors determining the quantity of life and health insurance demanded on an aggregate basis, employing cross sectional data from 30 Chinese provinces and Cities (2000) and US 50 states and the District of Columbia (1996) respectively. Life and health insurance could be defined as an unsought product because generally people would not voluntarily seek for a policy without the effort of insurers’ prospecting. Given this property of insurance products, we are very interested in the factors that may significantly influence the life and health insurance consumption. An individual’s life and health insurance need is deemed to be influenced by his personal disposable income, wealth, age, gender, occupation, education, and degree of risk aversion. However, in this research, we will not aim to study the micro consumer behavior towards life and health insurance consumption. Instead we will extend the individual basis to an aggregate level so that we could study the aggregate demand for life and health insurance. Specifically, the investigated dependent variable is the gross life and health insurance premiums per capita, while the independent variables are GDP/GSP per capita, percentage of people who are over 65, percentage of people who work in the state-owned corporations (for China only), average family size, educational level in terms of percentage of people who attain Bachelor Degree or
more, unemployment rate (for USA only), and percentage of metropolitan population.

3.1 Dependent Variable:

*Life and health insurance premiums per capita:*

The basic and common measurements used to quantify insurance purchases are usually the amount of coverage purchased, the premium spent, and the number of policies purchased. Prior research on life insurance consumption typically has used premium expenditures as the measure of insurance consumption (see, for instance, Hammond, Houston, and Melander, 1967; Ducker, 1969; Anderson and Nevin, 1975; Ferber and Lee, 1980; Goldsmith, 1983; Burnett and Palmer, 1984; and Beenstock, Dickinson, and Khajuria, 1986).

This study will employ the gross life and health insurance premiums per capita to access people’s average expenditures on life and health insurance.
3.2 Independent Variables:

3.2.1 GDP/GSP per capita:

The level of a country’s income has been found to be the most important factor in explaining the level of national life and health insurance consumption. The higher a country’s income, other things being equal, the more its spends on all types of insurance. D.B Truett and Lila J. Truett hypothesized that on an aggregate basis the demand for insurance would be positively related to income. Lewis (1989), Hakansson (1969), Fischer (1973), and Campbell (1980) have shown that the demand for life insurance is positively correlated with income. As income increases, life insurance becomes more affordable.

In addition, the need for life insurance increases with income as it protects dependents against the loss of expected future income due to premature death of the wage earner. Most people in either United States or China are not so wealthy that their dependents would perceive no substantial decline in income if the family provider(s) were to die. Thus, life insurance is generally considered to be a desirable good to protect dependents, and the higher the income of the family member (or members) who supports the family, the greater the demand for life insurance to protect this standard of living.

Using aggregated national data, Fortune (1973), and Beenstock, Dickinson,
and Khajuria (1986), and Truett and Truett (1990) have demonstrated that life insurance premium expenditures and national income are positively correlated. Previous studies of life insurance consumption have used gross national product (GNP) and gross domestic product (GDP) as measures of income. Here, the demand functions were estimated using a per capita GDP/GSP.

3.3.2 *Age --- Percentage of population over 65*

The world’s population, including that of the United States and China, is aging and an increasing life expectancy has resulted in an increasing proportion of elderly people in many societies. Increasing life expectancy translates into greater demand for savings-based life insurance products as well as for long-term care insurance.

Besides, age is used as a proxy for the general stage of the family unit. As a family matures, income level and number of dependents generally rise. As a result, households are likely to increase their demand for insurance.

3.2.3 *Education Level--- Percentage of People who attain bachelor degree or more*

In countries where individuals are educated over a longer period of time there should be a greater demand for life insurance, as education lengthens the period of dependency. Moreover, a higher level of education may lead to a
greater degree of risk aversion and more awareness of the necessity of insurance in general.

Therefore, it is hypothesized that the higher the level of education of the general population, ceteris paribus, the greater would be the demand for life insurance, that is, education is hypothesized to be positively related to life insurance consumption. The expectation was that the more educated or literate a population or household the greater the likelihood of understanding the need for insurance. More highly educated people would recognize the various types of life insurance available and perhaps have a stronger desire to protect their dependents in this way.

The percentage of people who attain bachelor degree or more is used in our study to reflect the level of education in the United States and China.

3.2.4 Average Family Size

Here, family size is hypothesized to have a positive relationship with total insurance demand. Research, however, has also demonstrated that economies of scale exist for families with many members (Lazear and Michael, 1988), implying that, as family size increases, demand for insurance will also increase, but at a decreasing rate. To test this hypothesis, the term, SIZE, is included in our study.
3.2.5 *Rate of employment in stated-owned enterprise*

State-owned enterprise in China, which represents stability and security, leads to a lower degree of risk aversion and less awareness of the necessity of insurance, which may reduce people’s desire to gain further protection from life and health insurance particularly. Hence, rate of employment in stated-owned enterprise is estimated to be negatively related to life insurance expenditures.

3.2.6 *Percentage of metropolitan population*

Studies conducted by some Chinese researchers show that many economic factors, for instance, population, population structure, and urbanization, have an effect on the development of regional insurance markets. In China, higher percentage of metropolitan population may raise life insurance consumption since people dwelling in metropolitan areas usually hold greater wealth and are better educated. Thus, in the model for Chinese Insurance market, positive relation is being expected between the percentage of metropolitan population and life insurance premiums per capita.

On the other hand, the story is expected to be different in the United States. People living in the countryside are farmers rather than peasants, who are middle class. One distinctive characteristic is that they are generally
self-employed. The self-employment brings about higher degree of risk aversion and the greater desire for purchasing insurance for additional protection. Therefore, in the U.S. model, the percentage of metropolitan population is hypothesized to negatively influence life insurance consumption.

3.2.7 Unemployment rate

Mantise and Farmer (1968) predicted that marriages, births, personal income, population size, relative price index, and employment determine the amount of life insurance that will be sold. Unemployment rate is hypothesized to be negatively related to the insurance consumption, as the high unemployment rate indicates the decline in income.

3.3 Hypotheses:

3.3.1 China:

Null Hypothesis One:

Life and health insurance premium per capita has a negative relationship with GDP per capita.

Null Hypothesis Two:

Life and health insurance premium per capita has a negative relationship with educational level that is measured in percentage of people holding bachelor or
higher degrees.

Null Hypothesis Three:

Life and health insurance premium per capita has a positive relationship with percentage of employment in the state-owned firms.

Null Hypothesis Four:

Life and health insurance premium per capita has a negative relationship with percentage of people who are over 65 years old.

3.3.2 United States:

Null Hypothesis One:

Life and health insurance premium per capita has a negative relationship with GSP per capita.

Null Hypothesis Two:

Life and health insurance premium per capita has a positive relationship with unemployment rate.

Null Hypothesis Three:

Life and health insurance premium per capita has a negative relationship with percentage of population who are over 65 years old.
Null Hypothesis Four:

Life and health insurance premium per capita has a positive relationship with percentage of metropolitan population.

Null Hypothesis Five:

Life and health insurance premium per capita has a negative relationship with percentage of population holding bachelor or above degrees.

3.4 Regression Models:

3.4.1 China (2000)

A linear regression model will be constructed to estimate the life and health insurance demand function in China across provinces as bellow.

\[
\ln(\frac{GP_{ic}}{PO}) = \alpha_0 + \alpha_1 \ln(\frac{GDP_{ic}}{PO}) + \alpha_2 \ln(EDU_{ic}) + \alpha_3 \ln(OCC_{ic}) + \alpha_4 \ln(OLD_{ic}) + \alpha_5 \ln(FAM_{ic}) + \epsilon_{ic} 
\]

Where

\( GP_{ic} \) — Gross life and health insurance premiums collected in year 2000 in province \( i \) in China (measured in RMB),

\( PO_{ic} \) — Population of Province \( i \) in year 2000,

\( GDP_{ic} \) — Gross Domestic Product of province \( i \) in year 2000,
EDU_{ic} — Average education years attained by citizens in province \(i\) in year 2000,

OCC_{ic} — Percentage of employees who work in the state-owned corporations in province \(i\) in year 2000,

OLD_{ic} — Percentage of citizens who are equal to or over 65 years old in province \(i\),

FAM_{ic} — Average family size of citizens in province \(i\) in year 2000,

\(\varepsilon_{ic}\) — random error term.

3.4.2 United States (1996)

Another linear regression model will be constructed to estimate the life and health insurance demand function in the U.S.A. across states as below.

\[
\ln\left(\frac{GP_{iu}}{PO_{ic}}\right) = \gamma_0 + \gamma_1 \ln\left(\frac{GSP_{iu}}{PO_{ic}}\right) + \gamma_2 \ln(UN_{iu}) + \gamma_3 \ln(OLD_{iu}) + \gamma_4 \ln(CITY_{iu}) \\
+ \gamma_5 \ln(EDU_{iu}) + \gamma_6 \ln(SIZE_{iu}) + \varepsilon_{iu}
\]

Where

\(GP_{iu}\) — Gross life and health insurance premiums collected in year 1996 in State \(i\) in the USA (measured in US$),

\(PO_{ic}\) — Population of State \(i\) in year 1996,

\(GSP_{iu}\) — Gross Domestic Product of State \(i\) in year 1996,

\(UN_{iu}\) — Unemployment rate of State \(i\) in year 1996,

\(OLD_{iu}\) — Percentage of citizens who are equal to or over 65 years old in State \(i\),
$SIZE_{iu} — Average family size of citizens in State i in year 1996,$

$CITY_{iu} — Percentage of metropolitan population in year 1996$

$EDU_{iu} — Average education years attained by citizens in State i in year 1996,$

$\varepsilon_{iu} — random error term.$
4. Data Analysis

4.1 China

4.1.1 Data Sources

The raw data used for estimation are extracted from the Chinese Statistical Yearbook 2001 and statistical yearbook from various provinces in the year 2001. The data of Hebei, Shanxi, Liaoning, Shandong, and Tibet are not included because the annual life insurance premiums collected in 2000 are not available in their statistical yearbook respectively.

4.1.2 Dependent Varible

The dependent variable presented in the following figure is life insurance premiums collected per capita in various provinces in 2000.
First of all, the data of gross life insurance premiums collected in the studied provinces are analyzed in the following table.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premiums</td>
<td>26</td>
<td>223.16</td>
<td>9212.89</td>
<td>3131.4545</td>
<td>2641.29886</td>
</tr>
<tr>
<td>Valid N</td>
<td>26</td>
<td>Qinghai</td>
<td>Shanghai</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It also can be noticed that in 2000, Provinces such as Beijing, Zhejiang, Jiangsu, Guangdong, Hunan had much more life insurance premiums than provinces such as Ningxia, Hainan, Guizhou.
If evaluated in terms of average life insurance premium collected, the statistics are presented as follows in Figure 4.2 and Table 4.2.

![Graph showing life and health insurance consumption per person in various provinces of China in 2000.](image)

**Table 4.2 Descriptive Statistics (SPSS Output)**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premiums Per Capita</td>
<td>26</td>
<td>20.77</td>
<td>550.35</td>
<td>100.1537</td>
<td>120.60874</td>
</tr>
<tr>
<td>Valid N</td>
<td>26</td>
<td>Guizhou</td>
<td>Shanghai</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Generally, life insurance consumption per capita in coastal provinces is greater than that in inland provinces, especially in west region with Xinjiang an exception.
4.1.3 Independent Variables

The first independent variable is GDP per capita of different provinces. The descriptive statistics is presented below.

Table 4.3 Descriptive Statistics (SPSS Output)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP Per Capita</td>
<td>26</td>
<td>2818.52</td>
<td>27187.28</td>
<td>8151.5666</td>
<td>5480.90154</td>
</tr>
<tr>
<td>Valid N</td>
<td>26</td>
<td>Guizhou</td>
<td>Shanghai</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The same as life insurance premiums per capita, Guizhou had the lowest GDP per capita while Shanghai had the highest. Furthermore, if comparing life insurance premiums per capita with GDP per capita, one can find that the two variables are highly positively correlated, which confirms that high income lead high life insurance products consumption.

The second independent variable is the percentage of total population who are over 65 years old in different provinces. Shanghai, Beijing, Tianjing, Jiangsu and Zhejiang are among the highest portion of population of over 65; Northwestern provinces Gansu, Qinghai, Ningxia and Xinjiang are among the lowest. The Descriptive statistics are the following.

Table 4.4 Descriptive Statistics (SPSS Output)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of People over 65</td>
<td>26</td>
<td>4.25</td>
<td>11.53</td>
<td>6.6982</td>
<td>1.63091</td>
</tr>
<tr>
<td>Valid N</td>
<td>26</td>
<td>Qinghai</td>
<td>Shanghai</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The third independent variable is to measure the regional education level. The rates of Bachelor or high degree holders are used for estimation. Beijing’s education level is the highest nationwide, much higher than the rest of the provinces. Guizhou and
Yunnan have the lowest higher degree rates. The following table concludes the data set.

### Table 4.5 Descriptive Statistics (SPSS Output)

<table>
<thead>
<tr>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of Bachelor+ Degree Holders</td>
<td>26</td>
<td>1.90</td>
<td>16.84</td>
<td>4.3076</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>26</td>
<td>Guizhou</td>
<td>Beijing</td>
<td></td>
</tr>
</tbody>
</table>

The fourth independent variable is the rate of employment in the State owned firms in different provinces. Beijing, Xinjiang, and Shanghai are ranked top three while Zhejiang, Guizhou and Anhui are the last three.

### Table 4.6 Descriptive Statistics (SPSS Output)

<table>
<thead>
<tr>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of Labor in State Owned Firms</td>
<td>26</td>
<td>7.28</td>
<td>41.12</td>
<td>15.9213</td>
</tr>
<tr>
<td>Valid N</td>
<td>26</td>
<td>Zhejiang</td>
<td>Beijing</td>
<td></td>
</tr>
</tbody>
</table>

The fifth independent variable is the average family size of different provinces. This variable has a very small range, from the smallest of Shanghai 2.80 to the biggest Hainan 4.06. It also has a small standard deviation, which shows that family sizes of different provinces do not vary much.

### Table 4.7 Descriptive Statistics (SPSS Output)

<table>
<thead>
<tr>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Family Size</td>
<td>26</td>
<td>2.80</td>
<td>4.06</td>
<td>3.4915</td>
</tr>
<tr>
<td>Valid N</td>
<td>26</td>
<td>Shanghai</td>
<td>Hainan</td>
<td></td>
</tr>
</tbody>
</table>

### 4.2 The United States

#### 4.2.1 Data Sources

GSP Data of each of 50 states and the District of Columbia are from the website

The most important source with respect to life insurance purchase is the *Life Insurance Fact Book: STATE BOOK*, published by the American Council of Life Insurance on January 01, 1997. **Table Title:** *US life insurance company premium receipts in dollars from life, health and annuity insurance and from deposit-type funds in each of 50 states and the District of Columbia in 1996*

The data for percentage of people over 65, average family size, unemployment rate, percentage of metropolitan population, as well as the population data for each of 50 states and the District of Columbia, are all obtained from Statistical Abstract of the United States (Online Versions: 1997 and 1998) http://www.census.gov/prod/www/statistical-abstract-us.html

Specifically, the data for percentage of people who attain bachelor degree or more is gained from 1998 Statistical Abstract of the United States.

4.2.2 Dependent Variable

States like California, New York, Texas and Illinois had much more life insurance consumption than states like Wyoming, Vermont, Montana, and North Dakota did. The descriptive statistics are presented as follows.
As to premiums per capita, D.C. has the largest quantity, which is far more than the second ranked state Delaware. Connecticut and New Jersey are also ranked very high while Oregon, New Mexico and Idaho had the lowest life insurance consumption per capita in 1996.

4.2.3 Independent Variables

The first independent variable is the rate of population over 65 years old. Florida, Pennsylvania and Rohde Island have the highest percentage of elder population. Alaska, Georgia and Utah have the lowest rates of population over 65, which are less than 10 percent.

The second independent variable is the rate of population with Bachelor Degrees or higher. Two states D.C. and Massachusetts have more than thirty percent of their
population holding Bachelor Degrees or more. Arkansas and West Virginia have the lowest rates, less than a half of the highest one.

Table 4.11 Descriptive Statistics (SPSS Output)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of Bachelor+ Degree Holders</td>
<td>51</td>
<td>14.60</td>
<td>33.70</td>
<td>23.3431</td>
<td>4.46602</td>
</tr>
<tr>
<td>Valid N</td>
<td>51</td>
<td>Arkansas</td>
<td>D.C.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The third independent variable is the rate of urban population. New Jersey and D.C are wholly urbanized, with one hundred percent population in cities. Vermont, Wyoming, South Dakota and Montana have the lowest rate of urban people.

Table 4.12 Descriptive Statistics (SPSS Output)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of Population in Cities</td>
<td>51</td>
<td>27.70</td>
<td>100.00</td>
<td>68.0922</td>
<td>21.11794</td>
</tr>
<tr>
<td>Valid N</td>
<td>51</td>
<td>Vermont</td>
<td>New Jersey &amp; D.C.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The fourth independent variable is the average family size of different states. This variable has a very narrow distribution with minimum 2.24 and maximum 3.06.

Table 4.13 Descriptive Statistics (SPSS Output)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Family Size</td>
<td>51</td>
<td>2.24</td>
<td>3.06</td>
<td>2.6000</td>
<td>12339</td>
</tr>
<tr>
<td>Valid N</td>
<td>51</td>
<td>D.C.</td>
<td>Utah</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The fifth independent variable is the unemployment rate of various states. D.C, New Mexico, Alaska and West Virginia have the highest unemployment rate among all states. Nebraska, North Dakota and South Dakota have relatively low unemployment rates.
Table 4.14 Descriptive Statistics (SPSS Output)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment Rate</td>
<td>51</td>
<td>2.90</td>
<td>8.50</td>
<td>5.2118</td>
<td>1.24027</td>
</tr>
<tr>
<td>Valid N</td>
<td>51</td>
<td>Nebraska</td>
<td>D.C.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.3 The Result of China

The first equation to be estimated for China is as follows and the EVIEWS regression output is presented in Table 4.15

\[
\ln(\frac{GP_{ic}}{PO}) = \alpha_0 + \alpha_1 \ln(\frac{GDP_{ic}}{PO}) + \alpha_2 \ln(EDU_{ic}) + \alpha_3 \ln(OCC_{ic}) + \alpha_4 \ln(OLD_{ic}) + \alpha_5 \ln(FAM_{ic}) + \epsilon_{ic}
\]  

(Equation 1)

Table 4.15 Regression Results of Equation 1 (EVIEWS Output)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\alpha_0)</td>
<td>-3.207286</td>
<td>1.895997</td>
<td>-1.691610</td>
<td>0.1062</td>
</tr>
<tr>
<td>(\ln(\text{GDP/PO}))</td>
<td>0.826179</td>
<td>0.157639</td>
<td>5.240940</td>
<td>0.0000</td>
</tr>
<tr>
<td>(\ln(\text{EDU}))</td>
<td>0.611963</td>
<td>0.328961</td>
<td>1.860292</td>
<td>0.0776</td>
</tr>
<tr>
<td>(\ln(\text{OCC}))</td>
<td>-0.103609</td>
<td>0.267957</td>
<td>-0.386664</td>
<td>0.7031</td>
</tr>
<tr>
<td>(\ln(\text{OLD}))</td>
<td>0.056050</td>
<td>0.345168</td>
<td>0.162384</td>
<td>0.8726</td>
</tr>
<tr>
<td>(\ln(\text{FAM}))</td>
<td>-0.381891</td>
<td>0.811632</td>
<td>-0.470522</td>
<td>0.6431</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.940289</td>
<td></td>
<td></td>
<td>4.255262</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.925361</td>
<td></td>
<td></td>
<td>0.741588</td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.202603</td>
<td></td>
<td></td>
<td>-0.155966</td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>0.820957</td>
<td></td>
<td></td>
<td>0.134364</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>8.027556</td>
<td></td>
<td></td>
<td>62.98929</td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>2.563681</td>
<td></td>
<td></td>
<td>0.000000</td>
</tr>
</tbody>
</table>

The second equation to be estimated is as follows; by making a small alternation whereby we cross out the variable Family Size from the first equation. The EVIEWS
regression output is presented in Table 4.16.

\[ \ln(\text{GP}_{ic}/\text{PO}) = \beta_0 + \beta_1 \ln(\text{GDP}_{ic}/\text{PO}) + \beta_2 \ln(\text{EDU}_{ic}) + \beta_3 \ln(\text{OCC}_{ic}) + \beta_4 \ln(\text{OLD}_{ic}) + e_{ic} \]  

(Equation 2)

Table 4.16 Regression Result of Equation 2 (EVIWES Output)

<table>
<thead>
<tr>
<th>Dependent Variable: LN(GP/PO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method: Least Squares</td>
</tr>
<tr>
<td>Sample: 1 26</td>
</tr>
<tr>
<td>Included observations: 26</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\beta_0)</td>
<td>-3.799384</td>
<td>1.391654</td>
<td>-2.730122</td>
<td>0.0125</td>
</tr>
<tr>
<td>LN(GDP/PO)</td>
<td>0.828508</td>
<td>0.154613</td>
<td>5.358585</td>
<td>0.0000</td>
</tr>
<tr>
<td>LN(EDU)</td>
<td>0.677887</td>
<td>0.292062</td>
<td>2.321040</td>
<td>0.0304</td>
</tr>
<tr>
<td>LN(OCC)</td>
<td>-0.138048</td>
<td>0.252944</td>
<td>-0.545768</td>
<td>0.5910</td>
</tr>
<tr>
<td>LN(OLD)</td>
<td>0.109923</td>
<td>0.319531</td>
<td>0.344012</td>
<td>0.7343</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.939628</td>
<td></td>
<td></td>
<td>4.255262</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.928129</td>
<td>S.D. dependent var</td>
<td>0.741588</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.198811</td>
<td>Akaike info criterion</td>
<td>-0.221880</td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>0.830044</td>
<td>Schwarz criterion</td>
<td>0.020061</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>7.884443</td>
<td>F-statistic</td>
<td>81.71082</td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>2.661834</td>
<td>Prob(F-statistic)</td>
<td>0.000000</td>
<td></td>
</tr>
</tbody>
</table>

By comparing the two results, we notice that the Adjusted R-squared of the second equation improves a little and the t-statistics of EDU gets higher than that of the first equation. That shows it is the variable Family Size that makes the equation worse in terms of overall fit and individual t-statistics. We choose the second equation as our estimation model and the hypothesis tests are presented below.
Null Hypothesis One: $\beta_1 \neq 0$.

$t_c=1.721$ (DF=21, one sided 5% level of significance)

$t_{\beta_1}=5.36 > t_c$

We can reject the null hypothesis and accept that GDP per capita has a positive relationship between life insurance premiums per capita in China.

Null Hypothesis Two: $\beta_2 \neq 0$.

$t_c=1.721$ (DF=21, one sided 5% level of significance)

$t_{\beta_2}=2.32 > t_c$

We can reject the null hypothesis and accept that the percentage of people holding bachelor or higher degrees is positively related to life insurance premiums per capita in China.

Null Hypothesis Three: $\beta_3 \neq 0$.

$t_c=1.721$ (DF=21, one sided 5% level of significance)

$| t_{\beta_3} | = |-0.55 | < t_c$

We cannot reject the null hypothesis that the percentage of employment in the
state-owned enterprises is positively related to life insurance premiums per capita in China.

**Null Hypothesis Four:** \( \beta_4 \neq 0. \)

\[ t_c = 1.721 \quad (DF=21, \text{one sided 5\% level of significance}) \]

\[ t_{p3} = 0.34 < t_c \]

We cannot reject the null hypothesis that the percentage of people over 65 years old have negative impact on life insurance consumption per capita in China.

### 4.4 Result of U.S.A

We have the third equation defined as follows and the estimation result is presented in Table 4.17.

\[
\text{LN}(\text{GP}_{iu}/\text{PO}) = \gamma_0 + \gamma_1 \text{LN}(\text{GSP}_{iu}/\text{PO}) + \gamma_2 \text{LN}(\text{UN}_{iu}) + \gamma_3 \text{LN}(\text{OLD}_{iu}) + \gamma_4 \text{LN}(\text{CITY}_{iu}) + \gamma_5 \text{LN}(\text{EDU}_{iu}) + \gamma_6 \text{LN}(\text{SIZE}_{iu}) + \varepsilon_{iu} \quad (Equation 3)
\]
Table 4.17 Regression Result of Equation 3 (EVIWES Output)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\gamma_0$</td>
<td>-3.845788</td>
<td>1.699189</td>
<td>-2.263308</td>
<td>0.0286</td>
</tr>
<tr>
<td>LOG(GSP/PO)</td>
<td>1.050671</td>
<td>0.146420</td>
<td>7.175745</td>
<td>0.0000</td>
</tr>
<tr>
<td>LOG(UN)</td>
<td>-0.272587</td>
<td>0.100842</td>
<td>-2.703121</td>
<td>0.0097</td>
</tr>
<tr>
<td>LOG(OLD)</td>
<td>0.275390</td>
<td>0.153024</td>
<td>1.799657</td>
<td>0.0788</td>
</tr>
<tr>
<td>LOG(CITY)</td>
<td>-0.068598</td>
<td>0.075778</td>
<td>-0.905249</td>
<td>0.3703</td>
</tr>
<tr>
<td>LOG(EDU)</td>
<td>-0.161092</td>
<td>0.153115</td>
<td>-1.052103</td>
<td>0.2985</td>
</tr>
<tr>
<td>LOG(SIZE)</td>
<td>0.007934</td>
<td>0.596617</td>
<td>0.013299</td>
<td>0.9894</td>
</tr>
</tbody>
</table>

Dependent Variable: LOG(GP/PO)
Method: Least Squares
Sample: 1 51
Included observations: 51

Similar to the adjustment of the case of China, we estimate the fourth equation through deleting the variable Family Size of the third equation. The EVIEWS output is shown in the following table.

\[
\text{LN}(\text{GP}_{i_c}/\text{PO}) = \gamma_0 + \theta_1 \text{LN}(\text{GSP}_{i_c}/\text{PO}) + \theta_2 \text{LN}(\text{UN}_{i_c}) + \theta_3 \text{LN}(\text{OLD}_{i_c}) + \theta_4 \text{LN}(\text{CITY}_{i_c}) \\
+ \theta_5 \text{LN}(\text{EDU}_{i_c}) + e_{ic} \quad (\text{Equation 4})
\]
By examining the two outcomes of the third and forth equations, we find out the

Adjusted R-squared has improved in the forth equation. Moreover, the t-statistics of

independent variables Unemployment and Old Rate also get higher if the forth

equation is used. We decide to use the forth equation output in the hypothesis tests,

which are presented as follows.

**Null Hypothesis One:** \( \theta_1 \not= 0 \).

\[
t_c = 1.684 \quad \text{(DF=40 approximately, one sided 5% level of significance)}
\]

\[
t_{0.02} = 8.02 > t_c
\]
We can reject the null hypothesis and accept that GSP per capita has a positive impact on life insurance premiums collected per capita in the United States.

**Null Hypothesis Two:** \( \theta_2 \geq 0. \)

\[ t_c = 1.684 \quad (DF=40 \text{ approximately, one sided 5\% level of significance}) \]

\[ | t_{\theta_2} | = | -2.74 | > t_c \]

We can reject the null hypothesis and say that unemployment rates have a negative impact on average life insurance consumption in the United States.

**Null Hypothesis Three:** \( \theta_3 \leq 0. \)

\[ t_c = 1.684 \quad (DF=40 \text{ approximately, one sided 5\% level of significance}) \]

\[ t_{\theta_3} = 2.15 > t_c \]

We can reject the null hypothesis, which suggests that rates of population over 65 years old have a positive relationship with life insurance consumption per person in the United States.

**Null Hypothesis Four:** \( \theta_4 \geq 0. \)

\[ t_c = 1.684 \quad (DF=40 \text{ approximately, one sided 5\% level of significance}) \]
\[ | t_{v4} | = | -2.74 | < t_c \]

We cannot reject the null hypothesis that the percentages of people living in cities are positively correlated with life insurance consumption per person in the United States.

**Null Hypothesis Five:** \( \theta_5 \neq 0 \).

\[ t_c = 1.684 \quad (DF=40 \text{ approximately, one sided 5% level of significance}) \]

\[ | t_{v5} | = | -2.74 | < t_c \]

We cannot reject the null hypothesis that the rates of people having bachelor or higher degrees has a positive relationship with life insurance premiums collected per person in the United States.

### 4.5 Comparisons

A comparison table is constructed to draw a conclusion of the above hypothesis tests.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>China</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premiums per capita</td>
<td>Gross Domestic Product per capita***</td>
<td>Gross State Product per capita***</td>
</tr>
<tr>
<td>Independent Variables</td>
<td>Percentage of population holding bachelor or higher degrees***</td>
<td>Percentage of Population holding bachelor or higher degrees*</td>
</tr>
<tr>
<td></td>
<td>Percentage of people over 65**</td>
<td>Percentage of people over 65***</td>
</tr>
<tr>
<td></td>
<td>Percentage of employment in state-owned firms**</td>
<td>Percentage of people living in metropolitan**</td>
</tr>
<tr>
<td></td>
<td>Unemployment rate***</td>
<td></td>
</tr>
</tbody>
</table>

Remarks: *** for significant coefficient at a 5% one sided level of significance  
** for insignificant coefficient with expected sign  
*   for insignificant coefficient with unexpected sign
Furthermore from the hypothesis tests of China and the United States, we found out that the following similarities and dissimilarities between the two countries in terms of life insurance demand per person.

1. In both countries, personal income that is measured by GDP (GSP) per capita has positively effects in average life insurance purchase.

2. Education level that is measured by rates of people holding bachelor degrees or higher has a positive relationship with life insurance consumption per capita in China, while it is not tested to have significant effect in life insurance purchase per capita in the United States.

3. The ageing population problem, which is denoted by rates of people over 65 years old, has positive impacts on life insurance consumption per capita in the United States, while it is not significantly positively related to the life insurance consumption per capita in China.
5. Discussions And Recommendations

Based on the estimations, we have come up with the following points and the corresponding recommendations regarding each perspective.

First of all, personal disposal income is a crucial factor that influences commercial life and health insurance product consumption, both in China and the United States. For instance, from our projection 1 percent increase in GDP per capita will lead to about 0.83 percent rising in life insurance consumption hold other factors constant in China. In the United States if GDP per capita increases 1 percent, life insurance premiums collected will rise about 1.05 percent hold other factors unchanged. The reason that 1 percent increase of GDP (GSP) per capita in the United States leads to more percentage change in life insurance consumption than in China could be that the income of Chinese people is still relatively low and the need for life and health protection due to income increase is not the first priority. To the contrary, the basic needs have generally gratified people of the United States and when one has extra money he/she would prefer seeking more life and health protection so as to make his/her financial plan more feasible and effective. Our forecast is that for China there is indeed great potential for life and health insurance markets. However this is just the beginning and the insurers should not market their products
overwhelmingly but focus on the basic needs of the Chinese people who may not need those complicated and comprehensive insurance policies.

Secondly, China’s education level, measured by the percentage of the population holding bachelor or higher degrees is a significant factor that influences life insurance consumption. Life insurance policies are unsought products and services, which are different from the common commodities. In China the situation is that most middle-aged people are less educated and traditional, and they save money for any contingency. They are less exposed to the life insurance products or even they know such products exist but they have no interest in them due to lack of enough information. Most mid-aged people do not consider life insurance as an alternative of their future security because firstly they have no such an incentive to deal with the financial condition of their families if a bread earner deceases, secondly they somewhat hold the idea of leaving things to chance which prevents them from buying life protection products. Notwithstanding, as China has gradually promoted her educational level of the entire population, we are expecting more and more new generations are willing to accept life insurance products as a risk-transferring tool.

Thirdly, as it is in the US, the percentage of the population who are over 65 years
old is not significant in China. The range of old people in China is from 4.25 to 11.53 percent while in the United States it lies between 5.2 to 18.5 percent. This suggests that the aging problem is more prominent in the United States than in China. The more population is aging, the more life protection is needed. Hence with other factors unchanged, 1 percent increase of percentage of 65 years old and above population will lead 0.27 percent increase in life insurance consumption in the United States. The reason that in China the rate of people over 65 is not significantly related to life insurance consumption probably is because most Chinese old people have several children who are supposed to support their parents. In the near future, when the middle aged Chinese are getting older, their only child may not be able to support them. Consequently now they need more life insurance products to secure their living standards than their parents. That is saying the middle aged in China actually are the most potential consumer segment for life insurance products.

Forthly, unemployment rates in the United States are negatively related to life insurance consumption. It is significant that 1 percent increase in unemployment rates in the United States will cause 0.27 percent declining in life insurance premiums collected. It is the less income due to unemployment that leads to
decrease in life insurance purchase. Although we did not include unemployment rate as an independent variable in the estimation for China, we do expect the same income effect in life insurance buying decision caused by unemployment. For insurers this would be a reference to make premiums payment deferred in the condition of income declining, such as unemployment of policyholders. This measure could reduce the rate of policy termination and the insurers can recharge the premiums when the policyholders’ financial situations get better.

Finally, due to the data insufficiency, we only take one year analysis for China and the United States, with 26 and 51 observations respectively. It is recommended that further studies should be undertaken when the data are available so that the result could be further improved.
6. References


5. Consumer and Life Insurance, 1987 reported by the OECD Committee on Consumer Policy.


7. Appendix

The United States Dada Sources:

1. US Life insurance company premiums receipts in dollars from life, health and annuity insurance, 50 states and the D.C. in 1996.
2. Gross State Product Data, Regional Account Data, Bureau of Economic Analysis.
4. Education: Percentage of population with Bachelor’s degrees or higher.
5. Total unemployed and insured unemployed.

China Data Sources:

1. China Statistical Yearbook 2001:
   3—9, Gross Domestic Product by Region (2000), pp 57—59
   4—3, Total Population and Sex Ratio by Region, p92
   4—5, Family Households and Collective Households and Their Population by Region, p94
   4—6, Age Composition by Region, p95
   4—7, Comparison of Population with various Education Attainment per 100000 persons by region, p96
   5—5, Number of Employed Persons a the year-end by Sector, pp112-113
5—8, Number of Staff and Works in State-owned Units at the Year-end by Sector

2. Statistical Yearbooks of different provinces.

Banking and Insurance: Basic Indicators of Insurance Business