AN ANALYSIS OF DEMAND FOR INDIVIDUAL LIFE INSURANCE IN CHINA

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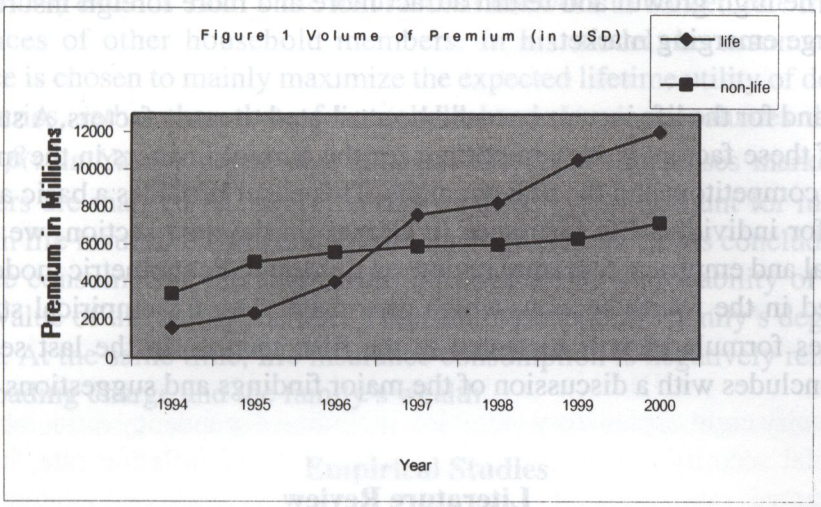
Abstract

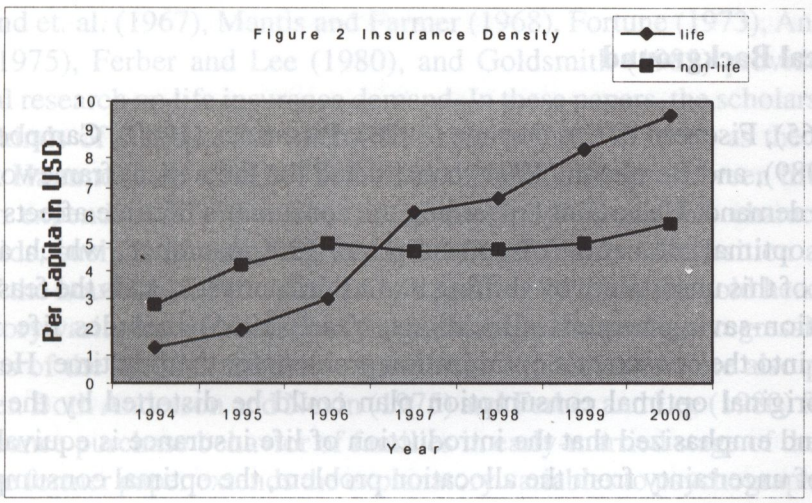
The life insurance market has grown substantially in China since the middle of the 1990s. This paper identifies factors that lead to variations in the demand for life insurance across regions of China. We conduct an empirical analysis by panel data models. The results support the hypothesis that demand for life insurance depends on the personal disposable income, consumer price index, number of families and education level. We also test the effects of death rate, dependency ratio and market structure of the life insurance industry on life insurance demand.

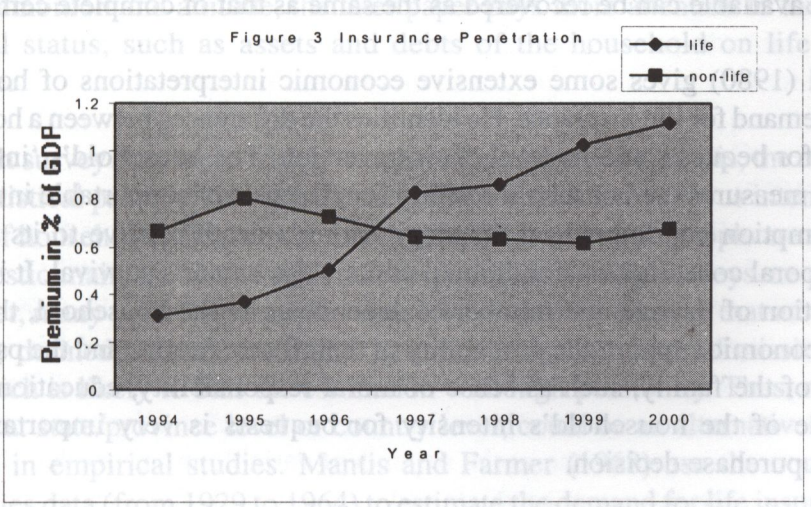
Introduction

During the last ten years, the Peoples Republic of China has made substantial developments in the insurance industry, especially for life insurance. China's economy has been characterized by extremely high economic growth for years, which provides a strong prerequisite for the growth of the life insurance market. Furthermore, the coverage and benefit of public social security programs have been reduced due to the privatization of state-owned enterprises; the potential for private life insurance is thus made higher. Figure 1 shows that the volume of life insurance premiums has increased rapidly in China, approximately 43% in real terms annually from 1994 to 2000. The growth rate of life insurance is much higher than that of non-life business. Figure 2 and Figure 3 show the change of insurance density and insurance penetration during the same period. Despite the upward trend of these two indices, the absolute value of density and penetration of life insurance are still very low in China, in comparison with the industrial nations (see Appendix A).

The Chinese life insurance market has only recently been opened to foreign insurers, in a limited scope. A state insurer, *China Life*, accounts for about three-quarters of total premiums nationwide. Three largest domestic life insurers, *China Life*, *PingAn*, and *China Pacific Life* dominate more than 95% market shares in China in 1999.[2] Forced by its plan to join WTO, the regulatory authority has to remove barriers to market entry gradually. On the other hand, the globalization process of financial services will also accelerate the liberalization of the Chinese life insurance







Source: *Sigma No.4/1996, No.4/1997, No.4/1998, No.3/1999, No.7/1999, No.9/2000, No.6/2001. Swiss Re*

market. The high growth and return attract more and more foreign insurers to join such a large emerging market.

The demand for the life insurance could be attributed to many factors. A study of the effects of these factors is very important for the current insurers in the market, the potential competitors and the policymakers. This paper provides a basic analysis of demand for individual life insurance in China. In the next section, we provide a theoretical and empirical literature review on this topic. Econometric models will be introduced in the fourth section, which uses panel data for empirical study. The hypotheses formulated will be tested in the fifth section. In the last section, the article concludes with a discussion of the major findings and suggestions for future research.

Literature Review

Theoretical Background

Yaari (1965), Fischer (1973), Fortune (1973), Pissarides (1980), Campbell (1980), Lewis (1989), and Bemheim (1991) constructed the theoretical frameworks of life insurance demand. Uncertainty regarding the consumer's lifetime affects his or her choosing optimal allocation of consumption. Life insurance, which allows the reduction of this uncertainty by shifting it to a third party, expands the feasible set of consumption-saving-bequest allocations. Yaari (1965) includes life insurance explicitly into the consumer's optimization problem for the first time. He indicated that the original optimal consumption plan could be distorted by the uncertain lifetime and emphasized that the introduction of life insurance is equivalent to the removal of uncertainty from the allocation problem, the optimal consumption with insurance available can be recovered as the same as that of complete certainty.

Campbell (1980) gives some extensive economic interpretations of households' optimal demand for life insurance. He identifies the differences between a household's intensity for bequests and its level of risk aversion. The household's 'intensity for bequests' measures the household's utility for all levels of supportable inter-temporal consumption conditional on the wage earner's death relative to its utility for inter-temporal consumption conditional on its wage earner's survival. It is likely to be a function of the age and number of dependents in the household, their future need of economic support, the probability of their future deaths, and the psychological traits of the family, such as sense of moral responsibility, education, etc. The magnitude of the household's intensity for bequests is very important for the insurance purchase decision.

Lewis (1989) extends Yaari's life insurance framework to concentrate more on the preferences of other household members. In his model, he assumed that life insurance is chosen to mainly maximize the expected lifetime utility of dependents/ beneficiaries, rather than that of household head. Lewis reevaluates the bequest function $\beta(\cdot)$ in Yaari's paper, and indicates that the $\beta(\cdot)$ increases markedly when consumers are married or have offspring as these events account for much of the change in life insurance ownership. With his formulation, Lewis concludes that life insurance consumption increases with the wage earner's probability of death, the present value of the family member's consumption, and the family's degree of risk aversion. At the same time, life insurance consumption is negatively related to the policy loading charge and the family's wealth.

Empirical Studies

Hammond et. al. (1967), Mantis and Farmer (1968), Fortune (1973), Anderson and Nevin (1975), Ferber and Lee (1980), and Goldsmith (1983) provide the early empirical research on life insurance demand. In these papers, the scholars employed various kinds of surveys, the micro-dataset at household level, as the sample for analysis. Hammond et. al. (1967) examine the relationships between life insurance premium expenditures and various economic and demographic characteristics of households, such as income, net worth holdings, family composition and marital status of the household, education and occupation of the household head. All these explanatory variables are statistically significant in the multiple regression models. Estimates of the income elasticity of premium expenditures were also provided in this paper. Both Anderson and Nevin (1975) and Ferber and Lee (1980) focus on the life insurance purchase behavior of families in early-married stage of the life cycle. While the former paper extends the explanatory variables to psychographics factors, such as ambition and attitude, the later paper pays more attention to the impact of financial status, such as assets and debts of the household on life insurance purchase.

Although survey data were widely employed in empirical analysis, the reliability is a big statistical problem for such dataset. Since most surveys focus intensely on the details of households' finances and demographics, and some people are sensitive to such questionnaires, unit and item non-response rates in the surveys are substantial. Moreover, many variables treated in the surveys may have values that are not always precisely defined, so they could also have relatively high rates of missing information, which is likely to bias the estimation with high possibility. Thus, macro-data, the data at state/province level or country level, could be an alternative for sample selected in empirical studies. Mantis and Farmer (1968) use the country level, time-series data (from 1929 to 1964) to estimate the demand for life insurance in the United States. The dependent variable is the quantity of life insurance sold by U.S.

companies. The independent variables include the price of life insurance relative to other consumer prices, number of marriages, number of births, personal income, population and employment. Although the forecasting technique in this paper was highly criticized, the macro-data selection was a good attempt at relevant research.

Browne and Kim (1993), Outreville (1996), and Lu (1999) report some recent empirical research. Browne and Kim (1993) apply Lewis's theoretical findings to the analysis of the international demand for life insurance. In their studies, the inhabitants of a country are assumed to be homogeneous relative to those of other countries. Data of more than forty countries in 1980 and 1987 are selected, and ordinary least squares (OLS) is used to estimate the log linear regression model. The authors specify eight explanatory variables, including dependency ratio, income per capita, social security expenditures per capita, expected inflation rate, insurance loading charged, rate of third-level education, life expectancy, and Islamic population proportion. The empirical findings support most theoretical hypotheses.

Lu (1999) uses the time series data from 1973 to 1996 to analyze the personal life. The author indicates that the same factors may affect both types in different degrees and estimates two regression equations for different kinds of life insurance under the framework of Seemingly Unrelated Regressions.

Methodology and Data

In this section, we apply the theoretical and empirical findings to the analysis of the demand for individual life insurance in China. First, we introduce the key variables and specify the hypotheses needed to conduct the empirical tests. Then, we discuss our data source and the features of our econometric model.

Variables

Life Insurance Consumption

Anderson (1975) introduces three measures of life insurance demand/consumption: premium expenditures, amount of life insurance purchased, and type of life insurance purchased. Premium data have been widely used primarily because of their availability. Although Browne and Kim (1993), and Outreville (1996) all use premiums as a proxy for demand in their analysis of international life insurance market, it is not a perfect measure because there are significant differences in insurance products and relevant regulations among countries. We can assert that the premium income is appropriate as the dependent variable in our model, due to the homogeneity of life insurance products and uniform regulation across the country. Just as mentioned in section one, the Chinese insurance market is controlled by a

few monopolists, and each insurer provides the same products nationwide, regardless of the demographic and economy differences among regions.

Personal Disposable Income

Almost all previous studies have shown that the demand for life insurance is positively correlated with income. Intuitively, as income increases, life insurance becomes more affordable. In addition, the need for life insurance increases because it protects dependents against the loss of expected future income due to premature death of the wage earner. While Browne and Kim (1993) use national income and Outreville (1996) uses GDP per capita as measures of income in their international studies of life insurance demand, we still believe that, as long as it is available, disposable personal income is the most accurate proxy to measure income.

Consumer Price Index

Most previous research has shown that inflationary expectation has a significant negative impact on life insurance demand. Since inflation can erode the value of death benefits, it makes life insurance a less desirable good. Browne and Kim (1993) demonstrate that the inflation variable is statistically significant and negatively related to life insurance consumption in their model. Outreville (1996) gets the same results in his studies. Lu (1999) extensively shows that the negative impact of inflation on life insurance demand is consistent, regardless of the types of life insurance, endowment or whole life and term life. Based on the assumption that the benefits of life insurance cannot be adjusted in time to reflect the inflation index exactly, we can also predict the negative impact of a consumer price index on life insurance demand in our model.

Education Level

Normally, a higher level of education may lead to a greater degree of risk aversion and more awareness of the necessity of insurance. Moreover, education level is an index for human capital value, which could also affect the demand for life insurance. Therefore, education level is often hypothesized to be positively related to life insurance consumption, and is no exception for our model.

Dependency Ratio

Both Campbell (1980) and Lewis (1989) provide a theoretical analysis that one of the main purposes of life insurance consumption is to protect dependents against financial hardship in the case of the wage earner's premature death. Browne and Kim (1993) and Lu (1999) also provide empirical evidence that the dependency ratio and consumption of life insurance are significantly, positively related.

There are several standards on how to define the dependency ratio exactly. Most previous studies rely on the United Nations' definition; that is, the ratio of the total

number of children under 15 to the total number of persons between 15 and 64. In China, most life insurance policies provide comprehensive coverage, including death benefits, annuities benefits and even disability benefits due to accident; thus, the effect of dependency ratio on life insurance demand could be ambiguous in our model.

Number of Families

Lu (1999) employs the number of families as an explanatory variable that is used to measure the changing population structure in time series model. Even though there are no more empirical studies on the impact of the number of families on the life insurance demand, we employ this variable in our model for two reasons. First, households are the basis units for personal financial plans and risk management, so the number of families is used as control for the population characteristics of life insurance demand. Second, we can distinguish the rural population from the urban population by limitedly defining the number of families only in urban areas. Because currently more than 95% of the individual life insurance policies are sold in urban areas in China, the higher the population is in urban areas, the higher the potential demand for life insurance will be.

Death Rate

From the prior research, we find life expectancy is usually used as an explanatory variable and works as a proxy for the probability of death. The hypothesis that life expectancy is negatively related to life insurance consumption is also often tested to be true. We employ death rate, instead of life expectancy, in our model. Besides the data availability, the main reason for this specification is that in the case of comprehensive coverage, with this test we can determine whether the demand for life insurance primarily results from the death coverage incentive or the annuity incentive.

Market Share of Dominant Insurer

Just as Outreville (1996) includes a monopoly dummy variable in his model, and Lu (1999) includes the concentration ratio of the life insurance industry in his study, we employ market share of the dominant insurer (*China Life*) as a proxy for market structure. We predict that this variable is negatively related to demand for life insurance, i.e., life insurance purchase incentive could be increased by more competitive activities, such as advertisements, promotions and other perfect services.

Social Security/Social Insurance Benefits

Intuitively, as an alternative method for lifetime protection, social security benefits should have significant effect on life insurance demand. In the United States, the social security program includes survivor benefits for the dependents and retirement benefits (public pension) for the insured. Fitzgerald (1987) explores the effects of social security on life insurance demand by married couples. He concluded that

survivor benefits would decrease the purchase of life insurance, and retirement benefits would increase it. Bernheim (1991) provides more theoretical analysis on the relationship among social security, life insurance, and life annuity. Browne and Kim (1993) also suggest that the national expenditures on social security (public pension) be statistically significant and positively correlated with demand for life insurance, with the macro-data on country level. We need to test this prediction again in this paper.

Price of Life Insurance, and Interest Rate

Obviously, an important variable, price of life insurance, should be included in the demand function. However, just as we indicate above, the life insurance market in China is not competitive, the price of various products is determined by the monopolists and rigidly regulated by the central government. Since each kind of product is sold at the same price over the country, if we employed the price as an explanatory variable and use the cross-section data by regions, the multicollinearity problem would occur inevitably. Thus, it is reasonable to omit the effect of price in our model. For the same reason, the effect of interest rate over cross-sectional analysis could also be neglected. The effect of interest rate changing over time-series is not taken into account either, unlike most prior research, because the time period is limited in our model.

Data and Model

In summary, eight factors are specified to be explanatory variables in our model, including personal disposable income, consumer price index, dependency ratio, number of families, market share of dominant insurer, education level, death rate, and social insurance benefits. The dependent variable is the premium income of individual life insurance, taken as a proxy for demand for individual life insurance.

The sample for our study consists of pooled cross-section, time-series data covering 30 provinces in China (not including Taiwan, Hong Kong and Tibet) over the period of 1997-1999. The definition of each variable and the data sources are presented in Appendix B. Table 1 reports descriptive statistics for the variables included in the regressions. It should be noted that, in order to determine whether life insurance is a luxury or necessity, the income elasticity should be estimated by using logarithm value of personal disposable income and premium income.

Table 1 Summary Statistics

Variable	Mean	Std. Dev.	Mini.	Maxi.
Prem	6.699	1.120	3.366	8.904
Income	8.575	0.244	8.187	9.299
CPI	0.004	0.023	- 0.036	0.053
Depen	0.463	0.066	0.329	0.603
Family	9.068	0.828	7.016	10.216
MS	0.705	0.177	0.086	0.979
EDU	0.049	0.039	0.009	0.230
Death	0.065	0.007	0.051	0.079
SSE	12.703	0.866	10.288	14.380

Province level data allow us to include province-specific characteristics in the analysis. The panel data models also allow us to overcome the unobservable heterogeneity problem that affects cross-section and time-series studies. Firstly, we use the Ordinary Least Squares (OLS) model to estimate the coefficients of each variable. We also need to test the heteroscedasticity of the regression, using Breusch-Pagan/ Godfrey statistic. Then, we employ panel data models to re-estimate the parameters. The panel data models often consist of four forms: one factor with fixed effects, one factor with random effects, two factors with fixed effects and two factors with random effects.

The one factor with fixed effects model may be written as:

$$y_{it} = \alpha_i + \beta' X_{it} + \varepsilon_{it}$$

There are K regressors/variables in X_{it}, not including the constant. So, X_{it} is a matrix with Kx(ixt) matrix, with each observation at cross-section i over time t. α_i is often defined as the group effect, which is taken to be constant over time t and specific to the individual cross-sectional unit i. The fixed effects model is a classical regression model.

The one factor with random effects model may be written as:

$$y_{it} = \alpha + \beta' X_{it} + \varepsilon_{it} + \mu_i$$

In this model, group effect is specified as μ_i, a group specific disturbance, which is similar to error term ε_{it}. The random effects model is a generalized regression model.

All disturbances have variance $Var\ [\varepsilon_{it} + \mu_i] = \delta^2 = \delta_\varepsilon^2 + \delta_\mu^2$. Thus, the efficient estimator is GLS, rather than OLS. In other words, If we assume the α_i or μ_i to be independent of X_{it}, OLS provides consistent and efficient estimates of the parameters. Otherwise, the regression of y_{it} on X_{it} will give a biased estimate of β. OLS needs to be modified.

Similarly, the panel data estimator also allows 'two factors' fixed and random effects models. The fixed effects model for a two factors design is

$$y_{it} = \alpha + \alpha_i + \gamma_t + \beta' X_{it} + \varepsilon_{it}$$

y is defined as the time effect, which is taken to be constant over cross-sectional unit i and specific to the each time-serial unit t. Thus, this model has an overall constant as well as a 'group effect' for each group and a 'time effect' for each period. The random effects model for a two factors design is

$$y_{it} = \alpha + \beta' X_{it} + \varepsilon_{it} + \mu_i + \omega_t$$

A full set of estimates is produced for the two factors models in the same fashion as for the one factor models.[3]

We hypothesizes that all the explanatory variables should be statistically significant in these models. Personal disposable income, number of families, social insurance benefits and education level should be positively related to the demand for life insurance. Consumer price index should be negatively correlated with the dependent variable. Market share of dominant insurer is a proxy to evaluate competition and should also be negatively related to the demand for life insurance. The signs of estimated coefficients of death rate and dependency ratio could be ambiguous because we are not able to determine which incentive is dominant in the life insurance purchase, the death protection or the annuity/saving.

Empirical Results

Table 2 reports the estimated parameters of the test equations, the corresponding t-statistics and other important values of the estimations. The personal disposable income variable, the consumer price index variable, the number of family variable, and the social insurance benefits variable are statistically significant in all models. Their signs are also consistent with our prediction. Income, number of families, and social insurance are positively correlated with the demand for life insurance; consumer price index is negatively related to the demand for life insurance, which supports the hypothesis that inflation has a dampening effect on the amount of insurance purchased. The coefficients of income in all models are greater than one. That means, the income elasticity of demand for life insurance is greater than one, which implies individual life insurance is a luxury in China. This empirical result is

reasonable for a developing county. The Breusch-Pagan Lagrange multiplier statistic is 5.107. It is not statistically significant, thus, we would not reject the hypothesis of homoscedasticity on the basis of this test.

Table 2 Regression Results

Variable	Ordinary Least Squares (OLS)		Panel Data Models: Random GE		Panel Data Models: Random GE and TE	
	Coefficient	*t-ratio*	*Coefficient*	*b/St.Er.*	*Coefficient*	*b/St.Er.*
Intercept	-16.938	-15.996***	-17.596	-10.498***	-17.262	10.133***
Income	1.287	8.342***	1.418	6.100***	1.404	6.066***
CPI	-9.148	-7.077***	-8.989	-8.062***	-7.255	-5.604***
Depen	0.487	1.073	0.200	0.270	0.178	0.248
Family	0.402	7.349***	0.351	5.042***	0.353	4.846***
MS	0.236	1.115	0.276	1.174	0.150	0.657
EDU	3.876	3.165***	2.097	1.952**	1.273	1.881*
Death	-5.856	-1.648*	-6.678	-1.256	-6.830	-1.373
SSE	0.692	10.388***	0.711	10.233***	0.705	9.609***
Adjusted R-Squared	0.95					
Breusch Pagan Test	5.107*(Chi-Squared with 8 degrees of freedom)*					
Breusch-Pagan LM Test				21.18		21.54
Hausman Test (Chi-Squared with 8 d.f.)				10.60		13.55

Note:
GE: Group Effects; TE: Time Effects.
*** significant at 0.01; ** significant at 0.05; * significant at 0.10.

The education level variable is statistically significant and positively related to life insurance in OLS model, which is consistent with prior studies. Although the hypothesis of a positive relationship between dependency ratio and demand for life insurance is supported by some previous studies, the dependency ratio is not statistically significant in our model. We can predict that, the main purpose for life insurance purchase of most Chinese households may not be to protect dependents against financial hardship in the case of the wage earner's premature death. Alternatively, the dominant incentive when buying life insurance could be the saving element and investment return of the policies. This conclusion could also be demonstrated by the results of some recent surveys of life insurance market in some regions of China, such as Beijing, Shanghai. On the other hand, the higher dependency ratio implies the higher consumption expenditures of the households. Since life insurance is a luxury, people with less deposable income due to higher consumption expenditures on necessities have to purchase less life insurance.

There are two other variables that are not statistically significant in our model, the market share of dominant insurer, and the death rate. The non-significance of death rate is another evidence that life insurance purchase in China does not mainly depend on the incentive of protection of premature death. This result is consistent with our finding of dependency ratio. The positive correlation sign and non-significance of market share of dominant insurer are beyond our expectation. This result could be explained by the effects of monopoly power, implicit pricing and brand. Since *China Life*, as the largest state-own insurance enterprise, has some explicit or implicit advantages over rivals (such as exclusive dealers, brand, and biased support from the regulatory authorities), people could have more preference for its products. Efficiency due to competition plays a less important role in the market.

The results of the panel data models are not much better than those of OLS. To determine the advantages of panel data models, we need to employ two specification test statistics: Breusch-Pagan's Lagrange multiplier statistic and Hausman's Chi-Squared statistic. In econometrics theory, large values of the Hausman statistic argue in favor of the fixed effects model over the random effects model. Large values of the LM statistic argue in favor of one of the panel data model against the classical regression with no group or time specific effects. A large value or the LM statistic in the presence of a small Hausman statistic argues in favor of the random effects model. From the Chi-Squared distribution table, we find that both Hausman's statistics in one-factor and two-factors models are not significant at percentiles level of 10%. Thus, we can claim that random effects models are preferred to the fixed effects models. At the same time, LM statistics are all significant, which means, panel data models (random effects) are better than classical models. In random effects models, the estimators are almost same as those in OLS, except for the decreasing of significance of the education level variable and death rate variable.

Conclusion

The Chinese life insurance industry has grown significantly in the last five years. In this paper, we find that the demand for individual life insurance is positively correlated with personal deposable income, number of families, social insurance benefits, and education level. It is also negatively correlated with inflation. One distinction of our empirical results from prior studies is that in China, the life insurance purchase does not depend on the need for protection against premature death. The reasons for this distinction might be the current consumption level and family structure in China, or the combination of death protection and savings in most life insurance products in China. In other words, saving and investment return, rather than death protection, could be the dominant incentive when people buy life insurance. Moreover, The non-significance relationship between market share of

dominant insurer and the life insurance demand demonstrates that market structure has few effects on life insurance consumption in such a non-mature market as China.

The possibility of future modification and extension for this research include. First, a study which separates the saving element from the death protection element of the life insurance policies would be very valuable. The ambiguous effects of dependency ratio and death rate would be determined more exactly. Second, if the price of life insurance were to be characterized by cross section, most limitation of our model would be overcome.

Furthermore, as more data become available, especially the time series data, the results of panel data models would become more accurate.

End Notes

[1]Minglai Zhu is now a Ph.D. candidate of Risk Management and Insurance Department at Georgia State University, U.S.A. The author gratefully acknowledges the instruction and suggestion of Dr. harold Skipper Jr.

[2]The market share is calculated with the data in *China Insurance Statistical Yearbook 2000*.

[3]For more techniques and theoretical supports of the panel data econometric models, please see Greene (1997) and Wooldridge (2002).

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Appendix A
Life Insurance Density and Penetration for Some Selected Countries

Country	Life Insurance Density (premiums per capita in USD)		Life Insurance Penetration (premiums as % of GDP)	
	1994	1999	1994	1999
Australia	628.9	1333.6	3.48	6.43
Brazil	9.2	11.8	0.27	0.35
Canada	570.5	674.6	3.04	3.19
Chile	72.6	114.3	1.95	2.65
Egypt	1.6	2.6	0.16	0.18
France	1204.7	1392.3	4.91	5.70
Germany	631.4	762.2	2.80	2.96
Hong Kong	409.4	858.7	1.89	3.63
India	4.0	6.2	1.29	1.39
Indonesia	3.9	4.5	0.43	0.66
Italy	202.0	657.8	1.13	3.24
Japan	3817.3	3103.4	10.10	8.87
Malaysia	71.7	78.1	2.30	2.16
P.R.China	1.3	8.3	0.31	1.02
Russia	11.5	9.9	0.59	0.78
Singapore	569.3	858.3	2.73	3.25
South Korea	782.1	760.5	9.10	8.39
Switzerland	2205.9	2914.0	5.99	8.06
Taiwan	412.1	636.1	3.64	4.83
Thailand	27.4	26.0	1.36	1.30
United Kingdom	1280.6	2502.8	7.31	10.30
United States	964.6	1446.6	3.63	4.23

Source: *Sigma No.9/2000, Sigma No.4/1996 Swiss Re*

Appendix B
Definitions and Sources of Variables

Prem	Total Premium Income (logarithm value; in million of RMB) [1]
Incom	Personal Disposable Income (logarithm value; in thousand of RMB, per capitaurban residents) [3]
CPI	Consumer Price Index (percentage change of general items) [3]
Depen	Dependency Ratio (ratio of population aged below 15 to population aged between 15 and 64) [3]
Family	Number of Families (in million of RMB) [3]
MS	Market Share of Dominant Insurer (percentage of premium income of China Life Corp.) [1]
EDU	Education Level (percentage of employment population with education at college level or above) [2]
Death	Death Rate [3]
SSE	Pension and Other Retirement Allowances (logarithm value; in 10 thousands of RMB)[2]

Sources: [1] China Insurance Statistical Yearbook 1998, 1999, 2000
[2] China Labor Statistical Yearbook 1998, 1999, 2000
[3] China Statistical Yearbook 1998,1999, 2000