FACTORS INFLUENCING CONSUMERS' LIFE INSURANCE PURCHASING DECISIONS IN CHINA

by

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ABSTRACT

The Chinese insurance industry has been growing substantially, and this provides a motivation to examine the insurance market in China. This study used survey data to identify key determinants related to Chinese consumers' ownership of life insurance, by using a probit model. The results revealed that several groups of variables influence Chinese consumers' life insurance purchases, including knowledge and trust, consumer profile and investment preferences, importance of product attributes, and socio-demographics. Also, this study applied factor analysis to investigate factors that are important for Chinese consumers regarding life insurance. Factor analysis results indicated that four factors are identified including importance of product attributes, consumers' financial strength, consumers' attitude and trust toward the life insurance industry, and consumer attributes. Lastly, to better understand Chinese consumers regarding life insurance, consumers were segmented into three main groups through applying cluster analysis. Each cluster shows distinct differences in purchasing criteria and socio-demographic characteristics.

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CHAPTER 1

INTRODUCTION

China has shown a high level of economic growth with gross domestic product (GDP) growing at an average rate of around 10% annually over the past decade (International Money Fund, 2010). The increase of disposable income has led to the growing demand for economic security for individuals and households in China. Furthermore, the rising aging population along with decreased family sizes due to the "one family one child" policy has changed in China's social structure. Fewer children to support parents in old age mean that parents are more likely to increase their savings, through various investment alternatives, including life insurance. Therefore, growing disposable income and changing socio-demographic structure may result in a growing demand for financial services and various insurance products. As well, Chinese consumers are also experiencing a growing awareness of insurance.

In addition, China entered the World Trade Organization (WTO) in 2001, and this represents new opportunities for global insurance companies to access one of the world's potentially largest markets. The China Insurance Regulatory Commission (CIRC)'s reforms in supervision, governance, and market infrastructure have also helped accelerate the rapid development of China's insurance industry. By the end of 2009, China's insurance gross premiums were around RMB 1,114 billion (≈ US$ 163 billion) as shown in Table 2.1. These gross premiums represent the total amount of life, non-life (health and accident insurance), and property and casualty insurance insured in 2009, based on the average exchange rate of 2009 (US$1 = RMB 6.8314). This growth has led to an increased interest in China's insurance market. Therefore, the purpose of this study is to

investigate key determinants influencing the ownership of life insurance in China, as well as to identify Chinese consumers' profiles regarding life insurance, in order to determine the factors related to life insurance purchasing decisions in China.

This study is organized as follows: Chapter 2 introduces a brief overview of the Chinese insurance market with respect to market development after WTO accession and the current state of China's insurance industry. Chapter 3 uses survey data to identify determinants affecting Chinese consumers' life insurance purchases, by using a probit model. Chapter 4, based on the same survey data, investigates key factors that are important for Chinese consumers regarding life insurance, using a factor analysis method. In Chapter 5, Chinese consumers' purchasing behavior regarding life insurance is analyzed using a cluster analysis method. The final section, Chapter 6, summarizes the key findings of the study.

CHAPTER 2

PROFILE OF CHINA'S INSURANCE INDUSTRY

Review of Development of China's Insurance Industry

China's insurance industry has grown rapidly since China's accession to the WTO in 2001. As shown in Table 2.1, during the year of 2000 to 2009, the gross premiums increased from RMB 159.6 billion to RMB 1,113.7 billion, and the total assets of China's insurance industry increased from RMB 337.4 billion to RMB 4,063.5 billion. Of this, around 67% of the gross premiums came from life insurance. Also, compound annual growth rate (CAGR) of premiums for life insurance and non-life insurance (health and accident insurance) over the same period were 27.3%, and 20.8%, respectively (Figure 2.1). This indicates that the life insurance market has been playing a large role in the Chinese insurance industry.

Panel A in Table 2.2 shows that China accounted for 3.3% of share of world market in terms of gross premium volume, and was ranked in the 6th position in 2008, compared to the top two developed countries Unites States (29.1%, ranked 1st) and United Kingdom (10.5%, ranked 3rd). Also, in terms of share of world market in life and non-life premium volume from 2007 to 2008, the two developed countries declined. For example, the United Kingdom shrank by 3.3% (from 17.1% to 13.8%) in life premiums, and 0.9% (from 6.9% to 6.0%) in non-life premiums. In contrast, China has increased by 1.5% (from 2.4% to 3.9%) in life premiums and 0.5% (from 2.0% to 2.5%) in non-life premiums (Swiss Reinsurance Company, 2008, 2009). Therefore, this substantial growth in China's insurance industry offers a motivation to examine what factors influence Chinese consumers' purchasing decisions for life insurance.

In addition, two insurance indicators help to illustrate the current and potential state of China's life insurance market: insurance density (insurance expenditure per capita) and insurance penetration (insurance expenditure share of GDP). As shown in Panel B in Table 2.2, per capita spending on total business (life and non-life insurance) in 2008 was US$ 105.4 in China, compared to US$ 4078.0 in United States, and US$ 6857.8 in United Kingdom. Also, China spent 3.3% of GDP on total business in 2008, compared to 8.7% for the United States, and 15.7% for the United Kingdom (Swiss Reinsurance Company, 2008, 2009). These figures indicate a large gap in insurance density and insurance penetration. This implies that China's insurance industry may still be at an initial stage, despite rapid premium income growth in recent years, and it has considerable potential for future. As shown in Figure 2.2, there has been substantial growth in China's life insurance density and penetration from 2001 to 2008. China's life insurance density reached US$ 72 premium per capita in 2008, which is approximately five times the US$ 15 premium per capita in 2001. Also, China's life insurance penetration increased from 1.17% to 2.21% over the same period.

Structure of China's Insurance Industry

China's insurance industry has gone through a process of fundamental reforms over the past ten years. In November of 1998, the China Insurance Regulatory Commission (CIRC) was established as a ministerial institution authorized by the State Council to directly supervise the insurance market, and to formulate and enforce related laws and regulations to maintain legal and regulatory operations of insurance industry. The CIRC has also strengthened the supervision and regulations in order to ensure fair competition in the insurance market after China's accession to WTO in 2001.

Insurance companies in China in terms of the nature of their business can be divided into the following three main categories: life insurance firms, property and casualty insurance firms, and reinsurance firms. Under the supervision and development by CIRC, by the end of 2009, a total of 300 insurance companies operated in China, of which 189 were life insurance firms, 103 were property and casualty insurance firms, and eight were reinsurance firms. Apart from these main companies, there were also nine insurance (group) corporations, nine insurance wealth management companies, and 156 foreign insurance company agencies. Table 2.3 outlines the top five Chinese and foreign insurance companies for life insurance, and property and casualty insurance, based on share of the market in 2009. It shows that both life, and property and casualty by Chinese insurance companies, make up more than 74% of market share. This high concentration ratio not only indicates that Chinese companies play an important role in China's insurance market, but may also imply that there exists opportunities for some foreign companies to expand in China.

Table 2.1 Overview of China's Insurance Industry (premiums RMB in billion)

Year	Life Premiums	Non-life[1] Premiums	Property Premiums	Gross Premiums[2]	Total Assets
2000	85.1	14.6	59.8	159.6	337.4
2001	128.8	13.6	68.5	210.9	459.1
2002	207.4	20.1	77.8	305.3	649.4
2003	267.0	34.2	86.9	388.0	912.3
2004	285.1	37.7	109.0	431.8	1,185.4
2005	324.4	45.3	123.0	492.7	1,522.6
2006	359.3	53.9	150.9	564.1	1,973.1
2007	446.4	57.4	199.8	703.6	2,900.4
2008	665.8	78.9	233.7	978.4	3,341.8
2009	745.7	80.4	287.6	1,113.7	4,063.5

Notes:

1. Health and accident insurance are counted as non-life insurance.

2. Gross premiums represent the total amount of life, non-life, and property premiums.

Source: China Insurance Regulatory Commission (CIRC), www.circ.gov.cn.

Table 2.2 Comparison of 2008 Life Insurance Market Among Top Developed Countries and China

Panel A. Insurance premium volume in USD

Country	Gross Premium Volume						Life Premium Volume						Non-life Premium Volume					
	World Ranking		Premium volume (USD in million)		Share of world market (%)		World Ranking		Premium volume (USD in million)		Share of world market (%)		World Ranking		Premium volume (USD in million)		Share of world market (%)	
	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007
World			**4,269,737**	**4,127,586**					**2,490,421**	**2,441,823**					**1,779,316**	**1,685,762**		
United States	1	1	1,240,643	1,237,890	29.1	29.6	1	1	578,211	579,215	23.2	23.4	1	1	662,432	658,674	37.2	38.9
United Kingdom	3	2	450,152	539,468	10.5	13.0	3	2	342,759	423,743	13.8	17.1	3	3	107,393	115,725	6.0	6.9
PR China	6	10	140,818	92,483	3.3	2.2	6	8	95,831	58,673	3.9	2.4	10	11	44,987	33,810	2.5	2.0

Panel B. Insurance density and penetration

Country	Insurance Density (premiums as per capita in USD)								Insurance Penetration (premiums as % of GDP)							
	World Rank		Total business		Life business		Non-life business		World Rank		Total business		Life business		Non-life business	
	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007
World			**633.9**	**621.4**	**369.7**	**370.6**	**264.2**	**250.8**			**7.1**	**7.6**	**4.1**	**4.6**	**2.9**	**3.1**
United States	9	7	4,078.0	4,089.3	1,900.6	1,924.9	2,177.4	2,164.4	13	15	8.7	8.9	4.1	4.2	4.6	4.7
United Kingdom	1	1	6,857.8	8,326.0	5,582.1	6,943.0	1,275.7	1,383.0	2	1	15.7	18.3	12.8	15.3	2.9	3.0
PR China	66	70	105.4	69.6	71.7	44.2	33.7	25.5	43	51	3.3	2.9	2.2	1.8	1.0	1.1

Note: Panel A shows two developed countries (U.S. and U.K.) and China, and associated insurance premium volume (USD in million) in 2008, and share of world market (%) in 2008 for total, life, and non-life business, respectively. Panel B shows insurance density in USD and insurance penetration share of GDP in 2008 separately, where insurance density and insurance penetration are two important insurance indicators to evaluate the current state and potential growth of insurance market. Insurance density is a measure of payments on insurance coverage per capita. Insurance penetration is premiums as a percentage of GDP.

Source: Swiss Reinsurance Company, sigma No 3, 2008 and 2009.

Table 2.3 An Overview of Top Five Chinese and Foreign Life, and Property and Casualty Companies in China in 2009

Company Name	Premium Volume (RMB in billion)	Share of the Market (%)	Company Name (Origin of Country)	Premium Volume (RMB in billion)	Share of the Market (%)
◆Top five *local* <u>life insurers</u> in China			◆Top five *foreign* <u>life insurers</u> in China		
China Life	295.04	36.23	AIA Group (U.S.)	8.04	0.99
Ping An Life	132.30	16.24	Generali Life (Italy)	4.50	0.55
Pacific Life	67.58	8.30	Huatai Life (U.K.)	4.33	0.53
Taikang Life	67.01	8.23	AVIVA-COFCO (U.K.)	4.18	0.51
Newchina Life	66.78	8.20	Citic-prudential Life (U.K.)	4.02	0.49
Total	**628.71**	**77.20**	**Total**	**25.07**	**3.07**
◆Top five *local* <u>non-life insurers</u> in China			◆Top five *foreign* <u>non-life insurers</u> in China		
PICC P&C	119.46	39.92	Chartis P&C (U.S.)	0.81	0.27
Ping An P&C	38.48	12.86	Tokio Marine (Japan)	0.33	0.11
Pacific P&C	34.23	11.44	MSIG (Japan)	0.33	0.11
China United P&C	19.44	6.50	Sumsung (Korean)	0.26	0.09
China Continent P&C	10.25	3.43	Allianz (Germany)	0.26	0.09
Total	**221.87**	**74.15**	**Total**	**1.99**	**0.67**

Note: Percentage of market share is a ratio of premium income collected by the company to the overall premium income of the life insurance companies in 2009.

Source: China Insurance Regulatory Commission (CIRC), www.circ.gov.cn.

Figure 2.1 Premium Income Growth for China, 2000-2009

USD in billion

CAGR $_{Property}$ = 19.1%
CAGR $_{Non\text{-}life}$ = 20.8%
CAGR $_{Life}$ = 27.3%

Year	Property	Non-life	Life
2000	9	2	12
2001	10	2	19
2002	11	3	30
2003	13	5	39
2004	16	5	41
2005	18	7	47
2006	22	8	52
2007	29	8	64
2008	34	11	96
2009	42	12	108

■ Property Insurance Premiums   ■ Non-life Insurance Premiums   ■ Life Insurance Premiums
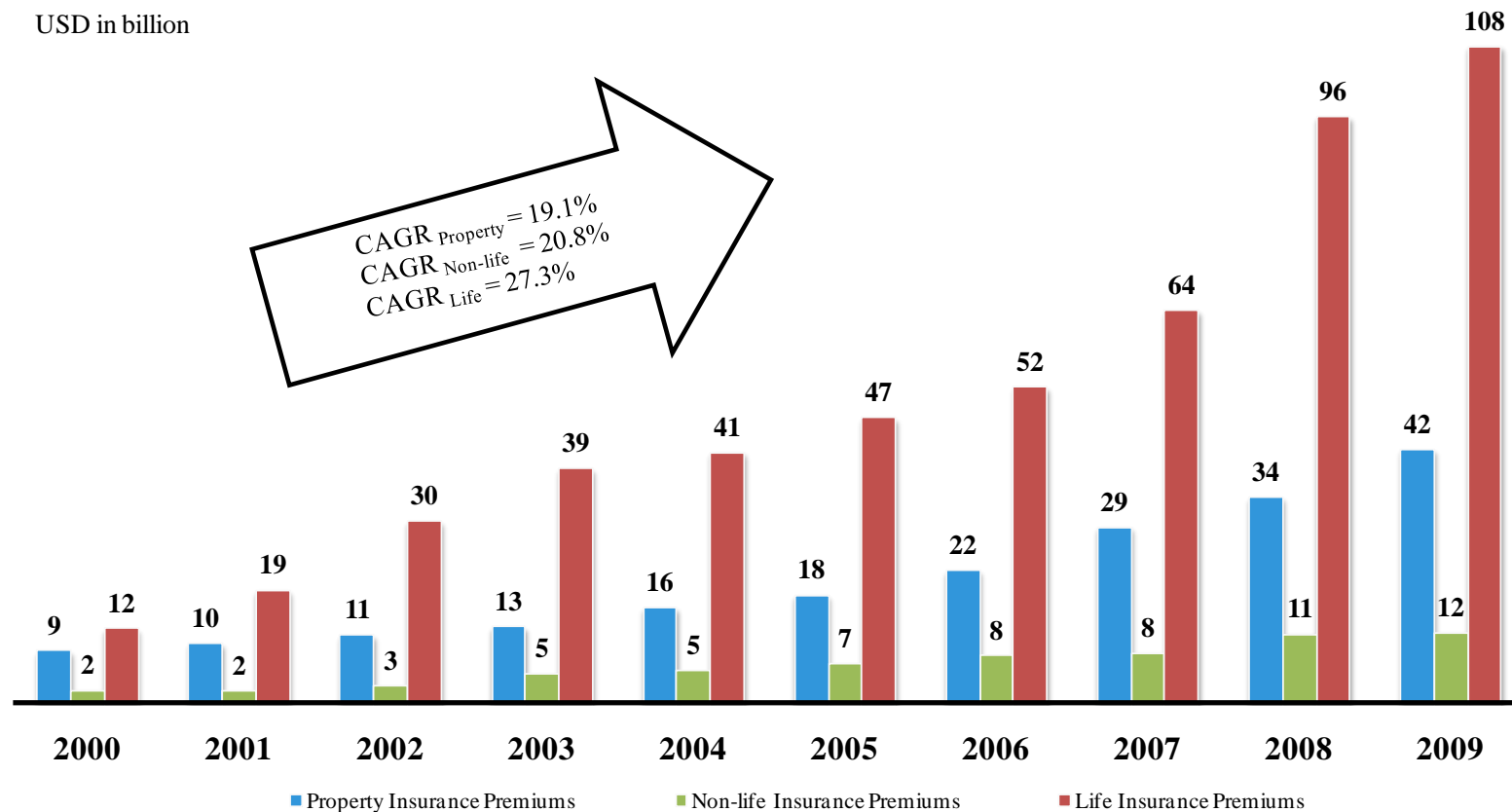
Notes:

1. Health and accident insurance are counted as non-life insurance.

2. Premium income shown here is converted in USD by using average exchange rate of year 2008 (US$1 = RMB 6.9253).

3. Compound Annual Growth Rate (CAGR) is used to describe the growth rate over a period of time. The formula used is $CAGR(t_0, t) = (\frac{V(t)}{V(t_0)})^{\frac{1}{t-t_0}} - 1$

Sources:

1. China Insurance Regulatory Commission (CIRC), www.circ.gov.cn.

2. State Administration of Foreign Exchange of the People's Republic of China (SAFE), www.safe.gov.cn.

Figure 2.2 Life Insurance Density and Penetration for China, 2001-2008

1.17%   1.72%   1.97%   1.78%   1.77%   1.70%   1.73%   2.21%

15   23   30   32   36   39   49   72

2001   2002   2003   2004   2005   2006   2007   2008

Life Insurance Density (USD)   Life Insurance Penetration
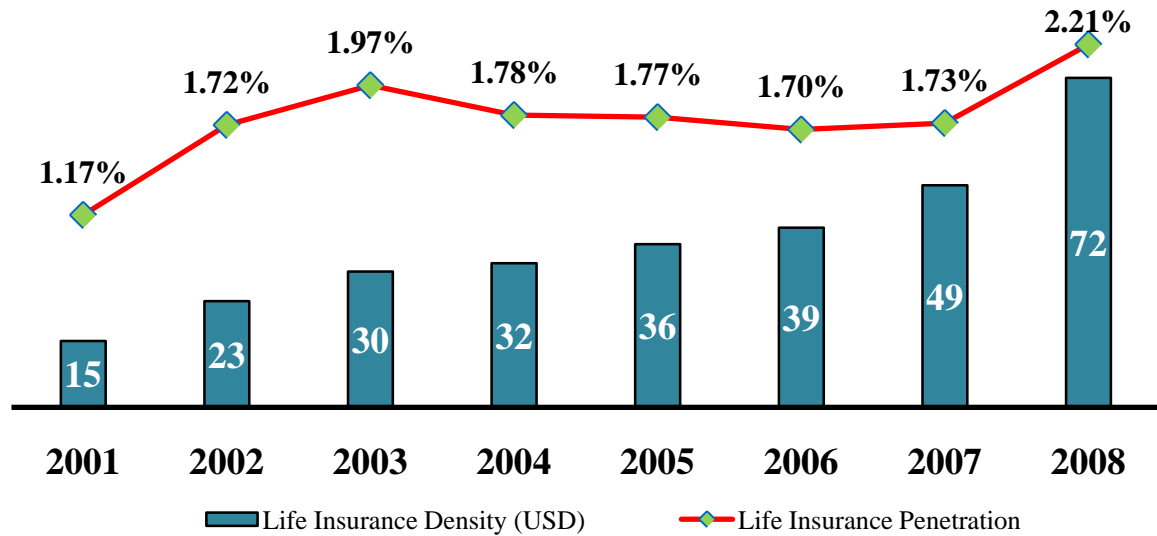
Notes:

Insurance Density = $\dfrac{\text{Insurance Premium}}{\text{Population}}$ (average exchange rate of 2008: US\$1 = RMB 6.9253)

Insurance Penetration = $\dfrac{\text{Insurance Premium}}{\text{Annual GDP}}$ (all penetrations provided here are in real terms)

Insurance density and insurance penetration ratios are two important indicators to evaluate the current state and potential growth of insurance market. The higher the ratios, the higher the level of insurance market development.

Sources:

1. China Insurance Regulatory Commission (CIRC), www.circ.gov.cn.

2. National Bureau of Statistics of China, www.stats.gov.cn.

3. State Administration of Foreign Exchange of the People's Republic of China (SAFE), www.safe.gov.cn.

CHAPTER 3

CHINESE CONSUMERS' OWNERSHIP OF LIFE INSURANCE

Introduction

In the past two decades, China's high economic growth has led to an increase in purchasing power and enhanced living standards, and demand for insurance has increased rapidly as well. As China continues to grow economically, stabilizing systems such as life insurance, which is the focus of this study, are likely to grow as well.

In the early theoretical literature, most theories regarding life insurance purchases concluded that risk aversion is one of the important factors to influence consumers' purchasing decisions (Yaari, 1965; Mantis and Farmer, 1968; Fisher, 1973; Campbell, 1980; Lewis, 1989; Bernheim, 1991).

Schlag (2003) provided an overview of theoretical concepts to explain the demand for life insurance, and some empirical evidence of factors that determine life insurance demand. Five main categories that influence life insurance purchases were found to be macroeconomic variables (e.g. economic growth, disposable income), socio-psychological factors (e.g. present mood and anticipation of the future), institutional determinants (e.g. regulatory quality), insurer action parameters (e.g. pricing, product design, sales channels, advertizing), and demographic variables (e.g. education, population). Results showed that a combination of demographic, macroeconomic, and socio-psychological factors explained demand for life insurance for both cross-section and time series analysis.

Zietz (2003) broadly considered key economic, financial, and demographic factors influencing life insurance purchases. These results included disposable income, financial development, social security, risk aversion, and education level.

However, the determinants influencing the purchase of life insurance vary from country to country. In the case of China, Hwang and Gao (2003) emphasized that increased levels of income, higher education levels, and demographics (such as family structure and the number of dependent children) were important factors in determining life insurance demand in China.

Hwang and Greenford (2005) provided a cross-section analysis of factors affecting life insurance consumption in mainland China, Hong Kong, and Taiwan. They identified key factors affecting life insurance purchases in China as income, education, social security, social structure, the one-child policy in China, the price of insurance, and economic development.

Zhang and Zhu (2008) examined the determinants of China's insurance development regarding life insurance, and property and liability insurance, by measuring premium volume, per capital GDP, insurance density, and insurance penetration using data for 225 cities. Results revealed that variables such as population, savings deposits, education, and social welfare expenditure were important in explaining life premiums. Demand for property insurance was substantially affected by wage level, and investment in fixed assets.

Based on the past studies, factors such as disposable income, education level, the degree of risk aversion, the price of insurance, social structure, and economic development were important. However, while a number of previous studies were based

more on theory, there have been fewer empirical studies. With the rapid growth in China's insurance market, further study is needed to better understand the factors that influence life insurance purchasing behavior in China. Therefore, this study attempts to provide some insights into the major determinants of the purchasing decisions for life insurance in China, through use of a consumer survey.

Data and Sample

To gather data for this study, an insurance survey was designed for Chinese consumers. The questionnaire design was based on the findings from prior literature on the topic, which consists of questions including consumer profile, investment preferences, product attributes, and socio-demographics. The survey was conducted by doing face to face interviews in three major cities of China in summer 2006, which included Shanghai, Shenzhen, and Chengdu. In total, 295 questionnaires were collected, in which 37 were excluded as they were used as testing questionnaires, leaving 258 complete surveys used as valid respondents for analysis.

Table 3.1 shows the socio-demographic characteristics of the sample respondents. Out of the 258 respondents, 45.74% are male and 54.26% are female. Over 91% of the respondents are below 44 years old, while over 68% of them are between 25 and 44 years old. Majority of the respondents in the sample (about 60%) have family size of 3-4 people. About 64% of the respondents are making over RMB 4,000 ($\approx$ US$ 503) per month per family unit (average exchange rate at the time of the survey (2006) was US$1 = RMB 7.9602). Over 56% of the respondents do not have dependent children, and the rest have at least one child. Majority of the respondents (over 82%) have a 2-3 year college or higher education level.

In this study, ownership of life insurance is the dependent variable. The independent variables are grouped into several categories, including 1) knowledge and trust (knowledge of life insurance, trust of life insurance industry), 2) consumer profile and investment preferences (proportion invested in life insurance, risk tolerance, buying preference from foreign firms), 3) importance of product attributes (importance of firms' financial strength, investment benefit, death benefit, low premium, agent reputation, and advertizing), and 4) socio-demographics (gender, have dependent children, family monthly income (> RMB 6,500), and education (> 2-3 years college). The detailed definition of variables used for the probit model is shown in Table 3.2. Also, the table reports mean of the variables by survey response and by ownership of life insurance.

Research Methodology

Probit Model

The dependent variable, ownership of life insurance, is a binary variable that equals one if consumer owns life insurance, and zero otherwise, and estimation in this study is conducted using an ordinal probit regression. Probit estimation here has some advantages compared to ordinary least squares (Aldrich and Nelson, 1984; Liao, 1994; Gujarati, 1998), as probit: 1) Avoids heteroskedasticity in the error term when the dependent variable has binary outcomes, and 2) Avoids inaccurate prediction of $\hat{Y}$ greater than 1, or less than 0, so maintains probability bounded by 0 and 1. The following is a description of the prodit model presented by Liao (1994). In general, the model can be expressed in probability as

$$Prob\ (y = j) = F\left(\mu_j - \sum_{k=1}^{k} \beta_k\, x_k\right) - F\left(\mu_{j-1} - \sum_{k=1}^{k} \beta_k\, x_k\right) \qquad [3.1]$$

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where, *y* is observed in *J* number of ordered categories *j= 1,2,..., J*, and *μ's* are unknown threshold parameters separating the adjacent categories to be estimated with *β's*. *F* is a standard normal cumulative distribution function (CDF). Also, all *μ*'s must be $\mu_1 (= 0) < \mu_2 < \mu_3 < ... < \mu_{j-1}$ in order for all the probabilities to be positive.

Marginal Effects

Based on the estimated results from the prodit model, Liao (1994) also discussed that it is possible to assess the marginal effect on probability of each independent variable by computing the change in predicted probabilities, given a unit change in independent variables (x_k). From the above equation 3.1, it can be transformed as follows:

$$\frac{\partial Prob\,(y=j)}{\partial x_k} = \left[f\left(\mu_{j-1} - \sum_{k=1}^{k} \beta_k x_k\right) - f\left(\mu_j - \sum_{k=1}^{k} \beta_k x_k\right)\right]\beta_k \qquad [3.2]$$

Results

Probit Model Estimates

Table 3.3 summarizes estimates of the probit model regarding Chinese consumers' ownership of life insurance. The McFadden R^2 is 0.255, which is considered an overall suitable goodness of fit for cross sectional survey data (Greene, 1997). Also, an alternative model fit measurement, proportion correctly predicted, is used (Malhotra, 1984). This ratio is calculated from the number of correctly predicted categories out of the number of observed categories, which equals one if probability of dependent variable is greater than or equal to 0.5, and zero otherwise. Results show that the model correctly predicted 77.52% of the dependent variable values, which are 200 observations out of the 258 total samples. Also, independent variables are categorized into four groups:

knowledge and trust, consumer profile and investment preferences, importance of product attributes, and socio-demographics.

Knowledge and Trust. The positive coefficient of knowledge of life insurance (0.456) is statistically significant at the 1% level. It indicates that knowledge of life insurance is strongly related to owning life insurance. The positive coefficient of trust of life insurance industry (0.122) implies that trust is related to their ownership of life insurance. However, this relationship may not be strong, as the coefficient was not statistically significant.

Consumer Profile and Investment Preferences. Coefficient estimates of the three variables in this group are proportion invested in life insurance (0.441), risk tolerance (-0.088), and buying preference from foreign firms (-0.350). The proportion invested in life insurance is significant at the 1% level. The negative sign of risk tolerance implies that consumers are more likely to own life insurance if their risk tolerance level is low. Also, the negative coefficient of buying preference from foreign firms is statistically significant at the 10% level, which implies that most Chinese consumers may prefer not to buy life insurance from foreign firms. However, if consumers' perceptions of foreign firms change in future as more foreign insurance firms enter China since the WTO, then foreign firms may gain additional market share.

Importance of Product Attributes. For the six importance of product attribute variables, only the importance of death benefit (-0.179) and the importance of low premium (0.335) show statistical significance at the 10% level, and the 5% level, respectively. The negative sign on the importance of death benefit may imply that the death benefit is less important to the consumer than the investment benefit.

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Also, the insignificant and negative magnitudes of the two coefficients, the importance of agent reputation (-0.055), and the importance of advertizing (-0.156), may indicate that these factors are less important in influencing consumers' decision to own life insurance. Therefore, insurance firms may wish to focus more on product awareness, company and agent images, product design, and marketing strategies in order for these two variables to more fully influence life insurance ownership.

Socio-demographics. Gender (0.725) is statistically significant at the 1% level. This may imply that most males in China as the head of the family have a relatively strong impact on the ownership of life insurance. The positive coefficient of have dependent children (0.807) is insignificant. As well, family monthly income more than RMB 6,500 (0.324) is statistically significant at the 10% level. The coefficient of education beyond 2-3 years college (-0.658) shows a negative sign, and statistical insignificance. This may indicate that educated consumers (attending at least 2-3 years college) may have less preference for life insurance, as they may have other forms of financial security, such as stable career earnings, and company pension and medical care. This may also imply that lower educated consumers may rely more on life insurance, as they may have less stable employment, and less pension benefits. Besides, higher educated consumers may also need improved products and services, or those that are more suited to their needs.

Marginal Effect Results

Table 3.4 displays each independent variable's marginal effect on levels of probability of Chinese consumers' ownership of life insurance.

Knowledge and Trust. The knowledge of life insurance shows a relatively high impact on the probability of owning life insurance. This is due to the increase in the variable from the base (approximate mean = 3) up to 5, where an increase of one unit in the variable would be an increase of 9.85% and 24.48% for the probability of owning life insurance, respectively. Likewise, the effect of a marginal decrease from base (approximate mean = 3) to 1 would be lower the probability of ownership of life insurance by 5.40% and 7.82%, respectively. It indicates that consumers with a broader knowledge of life insurance have a higher probability of owning life insurance. However, the trust of life industry is not strongly affected by the marginal changes. This lack of trust may relate to less effective regulation and less supervision of the insurance market.

Consumer Profile and Investment Preferences. In this group of variables, the proportion invested in life insurance has a strong impact on marginal changes from base (approximate mean = 2) to 5, where changes in probability of owning life insurance are 9.44%, 23.37%, and 40.36%, respectively. It indicates that consumers with a high percentage of assets invested in life insurance would have a higher chance to own more life insurance. The two variables, risk tolerance, and buying preference from foreign firms, show relatively little impacts on probability of owning life insurance.

Importance of Product Attributes. This group of variables does not show strong impacts on probability of owning life insurance, given their marginal effects. This may imply that other variable groups may have more explanatory power for insurance ownership.

Socio-demographics. This group of variables shows relatively high marginal effects. For example, the gender variable suggests that a male Chinese consumer would

have 17.94% higher probability to own life insurance than a female consumer. As well, an increase in family size (have dependent children) would increase probability of owning life insurance, as the marginal effect on probability of owning life insurance is 20.72%. Family monthly income with high amount (> RMB 6,500) is statistically significant at the 10% level, but the marginal impact of probability of owning life insurance given higher income is not high, only 6.48%. The education variable shows that consumers with a lower level of education would have a 15.77% higher chance to own life insurance, which is consistent with the negative sign of estimate of the variable. This is possibly because more educated consumers may have other forms of security, such as stable employment, pension, and medical care.

Summary

Along with rapid development of China's economy in the past twenty years, the life insurance market in China has also grown considerably. To investigate the specific factors that influence Chinese consumers' ownership of life insurance, a survey was conducted in summer 2006 that obtained data from 258 survey respondents.

Several categories of variables were identified to examine determinants affecting life insurance ownership in China, by using a probit model. These groups of variables included knowledge and trust, consumer profile and investment preferences, importance of product attributes, and socio-demographics. Results of the probit model showed that Chinese consumers had higher ownership of life insurance if they had more knowledge, high proportion invested in life insurance, and lower price of insurance. Also, the results confirmed in socio-demographics that consumers were more likely to own life insurance if they were male, had higher income, and larger family size.

Table 3.1 Socio-demographic Characteristics of Sample Respondents for Chinese Consumers' Insurance Survey (N = 258)

Socio-demographics		Shanghai		Shenzhen		Chengdu		Total	
		N	%	N	%	N	%	N	%
Gender									
Male		38	45.24	47	42.73	33	51.56	118	45.74
Female		46	54.76	63	57.27	31	48.44	140	54.26
	Total	**84**	**100**	**110**	**100**	**64**	**100**	**258**	**100**
Age									
25 and less		21	25	26	23.64	12	18.75	59	22.87
25-34		30	35.71	55	50	22	34.38	107	41.47
35-44		27	32.14	18	16.36	25	39.06	70	27.13
45-54		5	5.95	6	5.45	4	6.25	15	5.81
Above 55		1	1.19	5	4.55	1	1.56	7	2.71
	Total	**84**	**100**	**110**	**100**	**64**	**100**	**258**	**100**
Size of household									
1 person		5	5.95	17	15.45	9	14.06	31	12.02
2 people		13	15.48	16	14.55	8	12.5	37	14.34
3-4 people		53	63.1	59	53.64	42	65.63	154	59.69
5-6 people		13	15.48	14	12.73	4	6.25	31	12.02
7 or more		0	0	4	3.64	1	1.56	5	1.94
	Total	**84**	**100**	**110**	**100**	**64**	**100**	**258**	**100**
Family monthly income (RMB)									
Less than 1600		14	16.67	6	5.45	10	15.63	30	11.63
1600-3999		21	25	30	27.27	13	20.31	64	24.81
4000-6499		20	23.81	25	22.73	18	28.13	63	24.42
6500-8999		15	17.86	17	15.45	11	17.19	43	16.67
9000 and above		14	16.67	32	29.09	12	18.75	58	22.48
	Total	**84**	**100**	**110**	**100**	**64**	**100**	**258**	**100**
Dependent children under 18-year-old									
Do not have		41	48.61	70	63.29	36	55.53	146	56.59
Have		43	51.39	40	36.71	28	44.47	112	43.41
	Total	**84**	**100**	**110**	**100**	**64**	**100**	**258**	**100**
Education level									
Technical School		3	3.57	3	2.73	8	12.5	14	5.43
High School		5	5.95	9	8.18	16	25	30	11.63
2-3 years College		22	26.19	45	40.91	18	28.13	85	32.95
4 years University		49	58.33	43	39.09	19	29.69	111	43.02
Above 4 years University		5	5.95	10	9.09	3	4.69	18	6.98
	Total	**84**	**100**	**110**	**100**	**64**	**100**	**258**	**100**

Table 3.2 Description of Variables and Survey Response Scores for Probit Model for Owning Life Insurance in China

Variable Names	Mean			Description of Variables
	Survey Response (N= 258)	Own Life Insurance (N= 90)	No Life Insurance (N= 168)	
Dependent Variable				
Ownership of life insurance[†]	0.35	1	0	1= Yes, 0= otherwise
Independent Variables				
Knowledge and Trust				
Knowledge of life insurance	2.64	3.09	2.40	1= very little,…,5= very much
Trust of life insurance industry	2.70	2.94	2.57	1= very little,…,5= very much
Consumer Profile and Investment Preferences				
Proportion invested in life insurance	1.66	1.98	1.49	1= <5%, 2= 5-10%, 3= 11-20%, 4= 21-40%, 5= >40%
Risk Tolerance	2.43	2.44	2.43	1= lower risk,…,5= higher risk
Buying preference from foreign firms[†]	0.63	0.59	0.65	1= Yes, 0= otherwise
Importance of Product Attributes				
Importance of firms' financial strength	4.04	4.24	3.93	1= not important,…, 5= very important
Importance of investment benefit	3.96	4.01	3.93	1= not important,…, 5= very important
Importance of death benefit	3.45	3.44	3.45	1= not important,…, 5= very important
Importance of low premium	4.02	4.21	3.92	1= not important,…, 5= very important
Importance of agent reputation	3.54	3.51	3.55	1= not important,…, 5= very important
Importance of advertizing	3.21	3.14	3.24	1= not important,…, 5= very important
Socio-demographics				
Gender[†]	0.46	0.60	0.38	1= Male, 0= Female
Have dependent children[†]	0.43	0.48	0.41	1= have, 0= otherwise
Family monthly income (>RMB 6,500)[†]	0.39	0.50	0.33	1= > RMB 6,500, 0= otherwise
Education (> 2-3 years college)[†]	0.50	0.50	0.50	1= > 2-3 year college, 0= otherwise

Note: "†" denotes variables with binary scale, other variables are on 1 to 5-point Likert scale.

Table 3.3 Estimated Results of Probit Model for Owning Life Insurance in China

Parameter Estimates	Estimated Coefficient	Standard Error of Coefficient
Knowledge and Trust		
Knowledge of life insurance	0.456***	0.108
Trust of life insurance industry	0.122	0.099
Consumer Profile and Investment Preferences		
Proportion invested in life insurance	0.441***	0.124
Risk tolerance	- 0.088	0.094
Buying preference from foreign firms	- 0.350*	0.201
Importance of Product Attributes		
Importance of firms' financial strength	0.102	0.132
Importance of investment benefit	0.011	0.123
Importance of death benefit	- 0.179*	0.094
Importance of low premium	0.335**	0.136
Importance of agent reputation	- 0.055	0.111
Importance of advertizing	- 0.156	0.102
Socio-demographics		
Gender	0.725***	0.197
Have dependent children	0.807	0.509
Family monthly income (> RMB 6,500)	0.324*	0.195
Education (> 2-3 years college)	- 0.658	0.516

Pseudo R^2 (Goodness of Fit for Data N = 258)		
Cox and Snell	0.281	
Nagelkerke	0.387	
McFadden	0.255	
Proportion Correctly Predicted	77.52%	

Notes:

1.*, **, *** represent significance level at 10%, 5%, and 1%, respectively.

2. P-values are measured using Wald $\chi2$.

3. Proportion Correctly Predicted = percentage of correct predicted categories out of actual observed categories (1= if probability of dependent variable, ownership of life insurance, is ≥0.5, and zero otherwise). This model correctly predicted 200 survey respondents of Chinese consumers' ownership of life insurance out of total sample of 258.

4. Dependent variable is 1= own life insurance, 0 = not own life insurance. All other observed variables are scaled from 1 to 5, where 1 = less important, …, 5 = most important, or 1= strongly disagree, …, 5 = strongly agree, or 1 = very little, …, 5 = very much. Otherwise specified, such as gender, 0 = female, 1 = male.

Table 3.4 Estimated Marginal Effects From Probit Model: Change in Predicted Probability of Owning Life Insurance in China Based on a Unit Change from Approximate Mean

Approximate Mean / Variable Names	X= 0	X =1	X = 2				X = 3				X = 4			
	0 to 1	1 to 0	2 to 1	2 to 3	2 to 4	2 to 5	3 to 1	3 to 2	3 to 4	3 to 5	4 to 1	4 to 2	4 to 3	4 to 5
Knowledge and Trust														
Knowledge of life insurance							-7.82	-5.40	9.85	24.48				
Trust of life insurance industry							-3.36	-1.83	2.15	4.64				
Consumer Profile and Investment Preferences														
Proportion invested in life insurance			-5.28	9.44	23.37	40.36								
Risk tolerance			1.52	-1.35	-2.54	-3.58								
Buying preference from foreign firms		7.11												
Importance of Product Attributes														
Importance of firms' financial strength											-4.02	-2.88	-1.54	1.77
Importance of investment benefit											-0.53	-0.36	-0.18	0.18
Importance of death benefit							7.28	3.27	-2.57	-4.54				
Importance of low premium											-8.08	-6.81	-4.33	6.75
Importance of agent reputation											3.01	1.94	0.93	-0.87
Importance of advertizing							6.19	2.81	-2.28	-4.09				
Socio-demographics														
Gender	17.94													
Have dependent children	20.72													
Family monthly income (> RMB 6,500)	6.48													
Education (> 2-3 years college)		15.77												

Notes:

1. This table lists each independent variable's marginal effect on probability of consumers' ownership of life insurance. For example, if a consumer changes buying preference regarding buying life insurance from foreign firms from buy (1) to not buy (0), the probability of owning life insurance will increase by 7.11%. It indicates that most Chinese consumer do not prefer to own life insurance from foreign owned insurance firms.

2. Dependent variable is 1= own life insurance, 0 = not own life insurance. All other observed variables are scaled from 1 to 5, where 1 = less important, …, 5 = most important, or 1= strongly disagree, …, 5 = strongly agree, or 1 = very little, …, 5 = very much. Otherwise specified, such as gender, 0 = female, 1 = male.

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CHAPTER 4

FACTOR ANALYSIS REGARDING LIFE INSURANCE IN CHINA

Introduction

Gross insurance premium income for China in 2009 was RMB 1,113.7 billion, in which life premiums accounted for RMB 745.7 billion (about 67% of gross premiums). Also, China was ranked sixth in life insurance premium volume in 2008 worldwide, compared to eighth in 2007 (Swiss Reinsurance Company, 2008, 2009). Given the importance of the growing life insurance market in China, the objective of this analysis is therefore to explore underlying factors that are important for Chinese consumers regarding life insurance.

Data and Methodology

The same survey data mentioned in Chapter 3 are used here. Factor analysis is applied, and variables used for the factor analysis are shown on Table 4.1 to identify the latent factors regarding life insurance in China. Factor analysis is a statistical data reduction procedure for identifying the underlying dimensions that are highly correlated among a set of observable variables (Gorsuch, 1983; Johnson and Wichern, 2007).

Garson (2010) summarized a comparison of two major extracting methods, principal components analysis (PCA) and principal factor analysis (PFA). For this study, the PFA is chosen. The advantage of using the PFA is that the PFA is more commonly used for purposes of identifying causal relationships among observable variables and factors. However, for most cases, either the PCA or the PFA will give identical

substantive conclusions (Wilkinson et al., 1996). The Varimax with Kaiser Normalization rotation method is used here to get the most interpretable factor structure.

The following is a description of the factor analysis model that is applied in this study (Norušis, 1994, 2005). In general, the model for factor analysis can be expressed as

$$X_i = A_{i1}F_1 + A_{i2}F_2 + \ldots + A_{ik}F_k + U_i$$

where X_i is the ith standardized variable, the F's are the common factors that are not actually observed, the U_i is the unique factor that cannot be explained by the common factors, and the A's are the correlation coefficients called factor loadings between the variable (X_i) and factor (F_k).

After each variable (X_i) is expressed as a linear combination of factors, the values of the factors can be computed as factor scores for each case. In this study, factor scores are used instead of the original variables, as new variables for further analysis, such as in cluster analysis. That is, for case k, the score for the jth factor is estimated as

$$F_j = W_{j1}X_1 + W_{j2}X_2 + \ldots + W_{jk}X_k$$

where X_k is the case k's standardized score, the W's are factor loading of the variable for the given factors.

Results

Factor results show that goodness-of-fit indices for the 13 items are acceptable drawn from the 20 observable variables in Table 4.2. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.718. Chi-square in Bartlett's Test of Sphericity is 1145.20 with 190 degrees of freedom, and it is statistically significant at the 1% level. These results demonstrate that these items have discriminant validity and distinct construct (Norušis, 1994, 2005).

Also, according to Garson (2010), there are some common rules of thumb for determining the number of factors used. These include Kaiser Criterion, Cattell screen test, and parallel analysis. As a result, four factors are identified from the 20 observable variables, which explained 47.11% of total variance. Table 4.2 outlines the factor loadings that are greater than 0.4 for the 13 items ranging from 0.400 to 0.792.

Factor 1 - Importance of Product Attributes.   The first factor explains 16.44% of total variance of the 20 observable variables. As shown in Table 4.2, Factor 1 has high loading for a number of variables: the importance of low premium (0.792), firms' financial strength (0.772), and investment benefit (0.689). Also, it has moderate loadings on agent reputation (0.543), and death benefit (0.527).

Factor 2 - Consumers' Financial Strength.   The second factor explains 12.41% of total variance of the 20 observable variables. This factor is strongly associated with variables relating to family monthly income (0.714), possession of a car (0.693), and possession of a house/apartment (0.632) in Table 4.2.

Factor 3 - Consumers' Attitude and Trust toward Life Insurance Industry.   This third factor accounts for 10.57% of total variance of the 20 observable variables, which has high loadings on the variables of trust of life insurance industry (0.779), and attitude towards life insurance industry (0.758), shown on Table 4.2.

Factor 4 - Consumer Attributes.   The fourth factor explains 7.69% of total variance of the 20 observable variables. Table 4.2 shows that this factor has a moderate loading on consumers' risk tolerance (0.541). Also, it is associated with education (0.413) and gender (-0.400).

Summary

The factor analysis reduced 20 observable variables regarding life insurance in China to four latent factors. These factors explained 47.11% of total variance. First of all, the most important factor (Factor 1 - importance of product attributes) included variables related to the importance of low premium, firms' financial strength, investment benefit, agent reputation, and death benefit. Consumers' financial strength was the second important factor (Factor 2), which included family income, possession of a car, and possession of a house/apartment. The third important factor (Factor 3) was consumers' attitude and trust toward the life insurance industry. The last important factor (Factor 4) was consumer attributes, which was made up of consumers' risk tolerance, education, and gender.

Table 4.1 Description of Variables and Survey Response Scores for Factor Analysis for Life Insurance in China

Variable Names	Mean			Description of Variables
	Survey Response (N= 258)	Own Life Insurance (N= 90)	No Life Insurance (N= 168)	
Knowledge of life insurance	2.64	3.09	2.40	1= very little,…,5= very much
Risk tolerance	2.43	2.44	2.43	1= lower risk,…,5= higher risk
Acceptance of personal danger	2.69	2.69	2.68	1= very little,…,5= very much
Trust of life insurance industry	2.70	2.94	2.57	1= very little,…,5= very much
Attitude toward insurance industry	3.02	3.17	2.95	1= negative,….,5= positive
Proportion invested in life insurance	1.66	1.98	1.49	1= <5%, 2= 5~10%, 3= 11~20%, 4= 21~40%, 5= >40%
Buying preference from foreign firms[†]	0.63	0.59	0.65	1= Yes, 0= otherwise
Moral hazard	3.10	3.11	3.10	1= strongly disagree,….,5= strongly agree
Importance of firms' financial strength	4.04	4.24	3.93	1= not important,…, 5= very important
Importance of investment benefit	3.96	4.01	3.93	1= not important,…, 5= very important
Importance of death benefit	3.45	3.44	3.45	1= not important,…, 5= very important
Importance of low premium	4.02	4.21	3.92	1= not important,…, 5= very important
Importance of agent reputation	3.54	3.51	3.55	1= not important,…, 5= very important
Importance of advertizing	3.21	3.14	3.24	1= not important,…, 5= very important
Gender[†]	0.46	0.60	0.38	1= Male, 0= Female
Size of household	2.78	2.96	2.68	1= single, 2=2 persons, 3=3~4 persons, 4= 5~6 persons, 5= >7
Family monthly income	3.14	3.34	3.02	1= < 1600, 2= 1600~3999, 3= 4000~6499, 4= 6500~8999, 5= >9000
Possession of a car	1.96	2.12	1.87	1= no, 2= plan to buy one, 3= own one, 4= own two,5= own > 2
Possession of a house/apartment	2.82	3.04	2.70	1= no, 2= plan to buy one, 3= own one, 4= own two,5= own > 2
Education	3.34	3.37	3.33	1= technical, 2= high school, 3= 2-3 yrs college, 4= university,5= higher

Note: "†" denotes variables with binary scale, other variables are on 1 to 5-point Likert scale.

Table 4.2 Factor Loadings Regarding Life Insurance in China

Observable Variables	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1 Importance of Product Attributes				
Importance of low premium	0.792			
Importance of firms' financial strength	0.772			
Importance of investment benefit	0.689			
Importance of agent reputation	0.543			
Importance of death benefit	0.527			
Factor 2 Consumers' Financial Strength				
Family monthly income		0.714		
Possession of a car		0.693		
Possession of a house/apartment		0.632		
Factor 3 Consumers' Attitude and Trust toward Life Insurance Industry				
Trust of life insurance industry			0.779	
Attitude toward life insurance industry			0.758	
Factor 4 Consumer Attributes				
Risk tolerance				0.541
Education				0.413
Gender				-0.400

Goodness of Fit and Sampling Adequacy	
Kaiser-Meyer-Olkin (KMO) measure of samipling adequacy	0.718
Bartlett's Test of Sphericity: Approx. Chi-square	1145.2***
Total variance explained by the four factors	47.11%
Total variance explained by Factor 1	16.44%
Total variance explained by Factor 2	12.41%
Total variance explained by Factor 3	10.57%
Total variance explained by Factor 4	7.69%

Notes:

1. The factor analysis in this study is performed by using the extraction method: principal factor analysis, and the rotation method: Varimax with Kaiser Normalization.

2. The factor loadings represent correlation between the observable variables (survey questions) and identified factors, in which all factors with eigenvalues under 1.0 are dropped out so that the factors attribute to variance better than a single variable. Also, factor loadings (≥ 0.40) are displayed here, which include 13 out of the 20 observable variables, such that a suitable interpretable factor structure can be obtained.

3. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, and Bartlett's Test of Sphericity are measures for measuring goodness and fit of sampling adequacy. "***" indicates that it is significant at the 1% level.

4. All the observed variables are scaled from 1 to 5, where 1 = less important, … ,5 = most important, or 1 = strongly disagree, …, 5 = strongly agree, or 1 = very little, … ,5 = very much. Otherwise specified, such as gender, 0 = female, 1 = male.

CHAPTER 5

SEGMENTING CHINESE CONSUMERS' PURCHASING
BEHAVIOR FOR LIFE INSURANCE

Introduction

China's life insurance market has shown considerable growth since China's WTO

accession in 2001, and this growth may be of interest to insurance companies in China

wishing to expand their markets. To expand markets, insurance companies may wish to

segment consumers into discernable groups and target the "right" potential consumers for

marketing purposes. The aim of this analysis is therefore to identify groups of consumers

regarding purchasing behavior for life insurance, which is based on consumer

demographic characteristics and life circumstances.

Data and Methodology

The data used for the analysis is the same survey data of the 258 respondents

mentioned in Chapter 3. Also, four latent variables (factors) derived from the factor

analysis in Chapter 4 are used as new variables to segment the different characteristics of

Chinese consumers' purchasing behavior for life insurance. This is accomplished by

using cluster analysis, which captures the variables, and these include importance of

product attributes, consumers' financial strength, consumers' attitude and trust toward the

life insurance industry, and consumer attributes.

Cluster analysis is widely used to analyze multivariate data from surveys in order

to better understand the relationships between different clusters (e.g. consumer

groupings), as reflected in the variables selected. These groups or clusters are also

sometimes called market segments. Such segments can be used to determine particular

consumer segments of interest, or target markets. It is a form of data dimensionality reduction from an entire population or sample into specific smaller groups, which tries to maximize the homogeneity within each group (Norušis, 1994).

According to different clustering methods in data dimensionality reduction, the method utilized in this study is a two-step clustering, based on the four latent factors derived from the factor analysis in Chapter 4. This clustering method has some advantages over other methods, such as the K-mean clustering method (Bacher et al., 2004). The central task in the two-step cluster method is to reveal natural clusters within a data set that would not otherwise be apparent. The two steps are 1) pre-cluster the observations into many small sub-clusters, and 2) automatically group the sub-clusters resulting from the first step into the desired number of clusters. Also, the log-likelihood distance measure is used as a measure of similarity, and Schwarz's Bayesian Information Criterion (BIC) is chosen as the clustering criteria to determine the optimal number of clusters (Norušis, 2004).

Results

According to a common rule of thumb in the BIC, smaller values of the BIC indicate better models. Therefore, three clusters are identified that have the smallest BIC with the value of 669.99 (not shown), in which of the 258 total number of observations are assigned to three clusters, specifically 107 are assigned to the first cluster, 62 to the second, and 89 to the third. Also, discriminant analysis is performed to identify the variables that are important for distinguishing among the clusters. Results show that all four factors are very useful for identifying cluster membership, due to the large F-values that are statistically significant at the 5% level (not shown).

To better understand the cluster attributes among each cluster regarding life insurance in China, Table 5.1 presents a comparison of the survey response scores for the three clusters regarding the four latent factors derived from the factor analysis in Chapter 4. As well, Table 5.2 shows the percentage of consumers in each of the various clusters based on socio-demographic characteristics.

Cluster 1 - Low Income Consumers. In Cluster 1, consumers represent the largest consumer group with 107 observations. They have highest values on consumers' attitude and trust toward the life insurance industry, but have lowest value on consumers' financial strength, among all other segments shown on Table 5.1.

In comparing the three clusters based on socio-demographic characteristics in Table 5.2, over 56% of consumers are females in Cluster 1. The majority of those in Cluster 1 are age 44 years old and under, with around 73% of them below 34 years old. Also, over 23% of them are single, and 57% of them are below average family monthly income (< RMB 4,000). Also, only around 46% of them have a house/apartment, and over 50% of them do not have or plan to buy one. Over 75% of them do not have dependent children, and around 72% of them have 2-3 years college or university level of education.

Cluster 2 - Middle Income Consumers. Consumers in this cluster make up 62 of the 258 observations. Table 5.1 shows that they have lowest values on the importance of product attributes, and consumers' attitude and trust toward the life insurance industry, compared to all other groups. Also, they have a moderate value on consumers' financial strength.

Table 5.2 shows that consumers in this cluster are mostly females. Around 80% of Cluster 2 is within 25-44 years old, and over 62% of them have a family size of 3-4 people. Over 45% of them have family monthly income around RMB 4,000 to RMB 8,999, and around 55% of them own one house/apartment. Also, around 60% of them do not have dependent children. Over 82% of them have 2-3 year college or university level of education.

Cluster 3 - High Income Consumers. This cluster makes up 89 of the 258 observations. Compared to the other two clusters, consumers in this cluster have highest values of survey response scores on the importance of product attributes and consumers' financial strength. Also, they have relatively high values on consumers' attitude and trust toward the life insurance industry as shown on Table 5.1.

From socio-demographic characteristics shown on Table 5.2, consumers in this Cluster 3 are slightly over half males. Over 80% of them are age 25-44 years old. Also, the majority of them have a family size of 3-4 people. In comparing Cluster 3 with the other two clusters, the main characteristic in this cluster is that consumers have very good financial strength in terms of family monthly income, possession of a car, and possession of a house/apartment. Table 5.2 shows that around 60% of them have a family monthly income of RMB 9,000 or above, over 75% of them have one car or more, and over 90% of them have one house or more. Also, around 53% of them do not have a dependent child, and around 60% of them have university or higher level of education.

Also, as illustrated in Figure 5.1, consumers in each cluster have distinct differences regarding student's t test. First of all, the figure for Cluster 1 (top of Figure 5.1) shows that the importance measures for the consumers' financial strength, and

consumers' attitude and trust toward the life insurance industry exceed the critical values. Therefore, this cluster is characterized by consumers' financial strength, and consumers' attitude and trust toward the life insurance industry. Second, the figure for Cluster 2 shows that consumers' attitude and trust toward the life insurance industry is significant, while the importance of product attributes is only slightly significant. Therefore, consumers' attitude and trust toward the life insurance industry contributes more to cluster 2. Last, the figure for Cluster 3 shows that this cluster has characteristics that are substantially different from other two clusters. All factors are significant, except for consumer attributes. Therefore, it indicates that all other factors contribute more to cluster 3 than consumer attributes. In addition, the main characteristics and socio-demographic characteristics of the three clusters of Chinese consumers are outlined in Table 5.3.

Summary

In this study, cluster analysis was applied by using four latent factors derived from the factor analysis in Chapter 4. Results identified three consumer groups. Cluster 1 was low income consumers with 107 of the 258 observations. Consumers in Cluster 1 had highest values of survey response scores on consumers' attitude and trust toward the life insurance industry, compared to all other segments. However, they also had lowest values on consumers' financial strength. Cluster 2 was middle income consumers which made up 62 observations. They placed the lowest values on the importance of product attributes, and consumers' attitude and trust toward the life insurance industry. Cluster 3 contained 89 high income consumers who had the highest values on the importance of product attributes and consumers' financial strength, compared to all other clusters. Also,

they had a relatively high value on consumers' attitude and trust toward the life insurance industry.

From a socio-demographics perspective, Cluster 1 and Cluster 2 were mostly female consumers. Also, consumers in the Cluster 1 were identified to be younger (25 years old and less), and single with below average RMB 4,000 family monthly income. The majority of consumers (around 80%) in the Cluster 2 and Cluster 3 were middle age, around 25-44 years old, and with family size of 3-4 people. They had favorable financial strength in terms of higher level of family monthly income, and possession of a car and a house/apartment, compared to those of Cluster 1. Over 45% of the Cluster 2 consumers and over 35% of the Cluster 3 consumers had family monthly income of RMB 4,000-8,999. Also, around 60% of the Cluster 3 consumers had even higher family monthly income of RMB 9,000 and above. The majority of consumers in the Cluster 2 (over 53%) and the Cluster 3 (over 59%) had 2-3 years college or higher level of education, compared to those of Cluster 1 (around 40%).

Table 5.1 Comparison of Three Cluster Attributes Regarding Life Insurance in China (survey response scores)

	Cluster 1 Low Income Consumers	Cluster 2 Middle Income Consumers	Cluster 3 High Income Consumers	Overall (all consumers)
Factor 1 Importance of Product Attributes				
Importance of low premium	3.96	3.76	4.28	4.02
Importance of firms' financial strength	4.13	3.45	4.34	4.04
Importance of investment benefit	4.06	3.40	4.22	3.96
Importance of agent reputation	3.50	3.39	3.70	3.54
Importance of death benefit	3.30	3.19	3.80	3.45
Factor 2 Consumers' Financial Strength				
Family monthly income	2.36	2.66	4.40	3.14
Possession of a car	1.29	1.85	2.83	1.96
Possession of a house/apartment	2.23	2.84	3.52	2.82
Factor 3 Consumers' Attitude and Trust toward Life Insurance Industry				
Trust of life insurance industry	3.21	1.45	2.96	2.70
Attitude toward life insurance industry	3.50	2.06	3.12	3.02
Factor 4 Consumer Attributes				
Risk tolerance	2.45	2.40	2.44	2.43
Education	3.15	3.40	3.54	3.34
Gender	0.44	0.39	0.53	0.46
Number of Observations	**107**	**62**	**89**	**258**

Notes:

1. The four latent factor derived from the factor analysis are used as new four variables in the cluster analysis.

2. All variables are scaled from 1 to 5, where 1 = less important, …, 5 = most important, or 1 = strongly disagree, …, 5 = strongly agree, or 1= very little, …,, 5 = very much. Otherwise specified, such as gender, 0 = female, 1 = male.

Table 5.2 Cluster Socio-demographic Characteristics of Chinese Consumers Regarding Life Insurance (percentage of consumers in various clusters)

Socio-demographics	Cluster 1 Low Income Consumers	Cluster 2 Middle Income Consumers	Cluster 3 High Income Consumers
Gender			
Female	56.10	61.30	47.20
Male	43.90	38.70	52.80
Age			
25 and less	39.30	9.70	12.40
25-34	33.60	46.80	47.20
35-44	18.70	32.30	33.70
45-54	6.50	6.50	4.50
above 55	1.90	4.80	2.20
Size of household			
1 person	23.40	9.70	0.00
2 people	15.00	14.50	13.50
3-4 people	49.50	62.90	69.70
5-6 people	12.10	8.10	14.60
7 or more	0.00	4.80	2.20
Family monthly income (RMB)			
less than 1600	16.80	19.40	0.00
1600-3999	40.20	27.40	4.50
4000-6499	33.60	29.00	10.10
6500-8999	9.30	16.10	25.80
9000 and above	0.00	8.10	59.60
Possession of a house/apartment			
No	31.78	14.52	1.12
Plan to buy one	17.76	11.29	4.49
Have one	45.79	54.84	50.56
Have two	4.67	14.52	29.21
Have more than two	0.00	4.84	14.61
Possession of a car			
No	77.57	48.39	10.11
Plan to buy one	15.89	22.58	10.11
Have one	6.54	25.81	68.54
Have two	0.00	1.61	8.99
Have more than two	0.00	1.61	2.25
Dependent child under 18-year-old			
Do not have	78.50	59.70	52.80
Have	21.50	40.30	47.20
Education level			
Technical School and lower	4.70	8.10	4.50
High School	19.60	3.20	7.90
2-3 years College	35.50	35.50	28.10
4 years University	36.40	46.80	48.30
Above 4 years University	3.70	6.50	11.20
Number of Observations	**107**	**62**	**89**

Table 5.3 Profiles of Three Clusters of Chinese Consumers

| Characteristics	Cluster 1 - Low Income Consumers (N=107)	Cluster 2 - Middle Income Consumers (N=62)	Cluster 3 - High Income Consumers (N=89)
a) Main Characteristics	▪ little care on product attributes ▪ positive attitude and trust ▪ less concerns on attitude and trust ▪ vulnerable to risk ▪ some knowledge of life insurance ▪ prefer investment benefits	▪ less care on product attributes ▪ negative attitude and trust ▪ little concerns on attitude and trust ▪ risk-aversion ▪ a little knowledge of life insurance ▪ prefer investment benefits	▪ care more on product attributes ▪ slightly positive attitude and trust ▪ neutral on attitude and trust ▪ can take some risks ▪ high knowledge of life insurance ▪ prefer investment benefits
b) Demographic Characteristics	▪ Over 56% Females ▪ Over 72% below 34-year-old ▪ 50% 3-4 people, and 23% single ▪ Over 57% low incomes below average 4,000 ▪ Over 70% 2-3 years college and lower level	▪ Over 61% Females ▪ Around 80% age 25-44 years old ▪ Around 63% 3-4 people ▪ Over 45% middle incomes and above around 4,000-8,999 ▪ Over 80% 2-3 years college and 4 years university or higher	▪ Over 52% Males ▪ Over 80% age 25-44 years old ▪ Over 70% 3-4 people ▪ Over 60% high and higher incomes 9,000 and above ▪ Over 85% 2-3 years college and 4 years university or higher

Figure 5.1 Comparison of Attribute Importance for Clusters (T-statistics) for Life Insurance in China

Cluster 1: Low Income Consumers (N = 107)
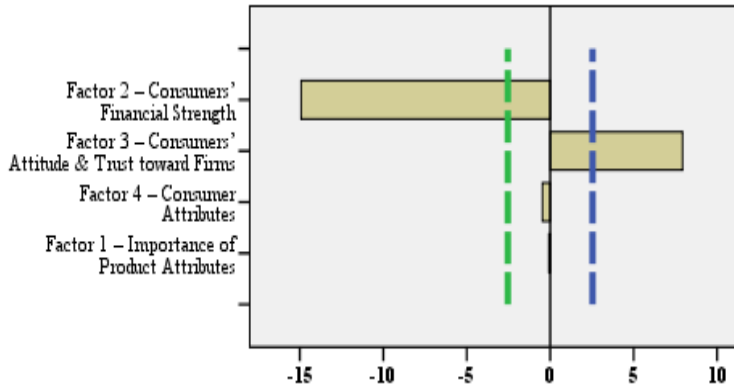
The chart for Cluster 1 shows that consumers' financial strength, and consumers' attitude and trust toward the life insurance industry exceed the critical values. Therefore, consumers' financial strength and attitude and trust toward the life insurance industry are more important to Cluster 1.

Cluster 2: Middle Income Consumers (N = 62)
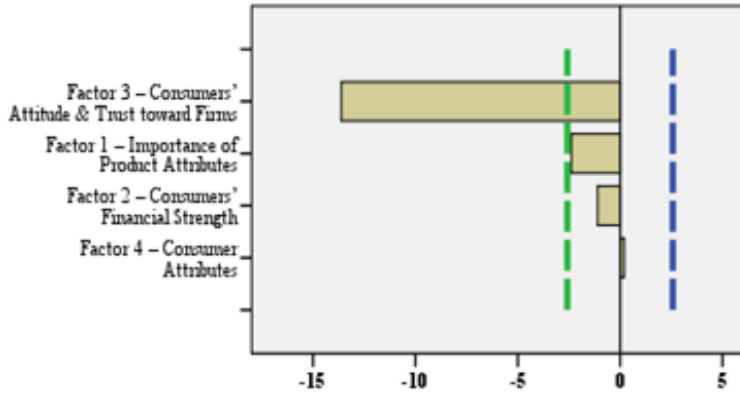
The chart for Cluster 2 shows that consumers' attitude and trust toward the life insurance industry is significant, while product attributes is slightly significant. Therefore, consumers' attitude and trust toward the life insurance industry contributes highest to Cluster 2.

Cluster 3: High Income Consumers (N = 89)
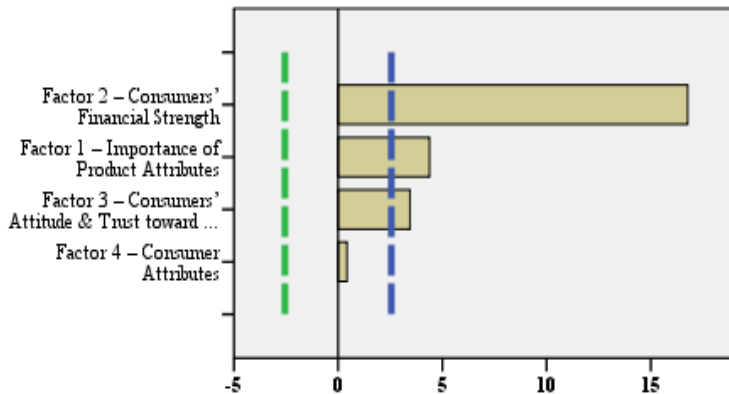
The chart for Cluster 3 shows that all factors are significant, except for consumer attributes. Therefore, consumer attributes is not important, while all of the other factors contribute more to Cluster 3.

Notes:
1. These three charts are the "by variable" attribute importance charts for each cluster, in which the variables lined up on the Y-axis are in descending order of importance.

2. "---" dashed vertical line denotes the critical values for determining the significance of each factor; histogram denotes test statistic and *t* values are shown at bottom of each figure. For a factor to be considered significant, its *t statistic* must exceed the dashed line in either a positive or negative direction.

CHAPTER 6

SUMMARY

China has experienced high economic growth of about 10% GDP growth annually over the past two decades, and the insurance market has grown as well. Premium volumes of total business increased to 3.3% of world share for China in 2008. Also, Life premium income grew at a 27.3% of compound annual growth rate during the periods of 2000-2009. Under the supervision and development by CIRC, by the end of 2009, a total of 300 insurance companies operated in China, including 189 life insurance companies, 103 property and casualty insurance firms, and eight reinsurance firms.

This study focused on ownership of life insurance in China by using an insurance survey, which was carried out by doing face to face interviews in three major cities of China (Shanghai, Shenzhen, and Chengdu) in summer 2006. A variety of models were estimated using 258 survey respondents, including a probit model, factor analysis, and cluster analysis.

Variables in the probit model were grouped into four categories: 1) knowledge and trust, 2) consumer profile and investment preferences, 3) importance of product attributes, and 4) socio-demographics. Results indicated that a number of variables helped explain Chinese consumers' ownership of life insurance. These included knowledge of life insurance, proportion invested in life insurance, buying preference from foreign firms, importance of death benefit and low premium, gender, and family monthly income.

For the factor analysis, four factors (groups of variables) were identified regarding life insurance in China, which included 13 of the 20 observable variables. These factors

explained 47.11% of the total variance. The factors included importance of product attributes, consumers' financial strength, consumers' attitude and trust toward the life insurance industry, and consumer attributes.

Cluster analysis was used with a two-step method, and was performed on the four latent factors derived from the factor analysis. Three clusters of consumers were identified in order to segment Chinese consumers into groups. Cluster 1 contained consumers with low income, and over 56% of them were females. Consumers in this cluster had highest values of survey response scores on consumers' attitude and trust toward the life insurance industry, but lowest values on consumers' financial strength. Cluster 2 included consumers with middle income and over 61% of them were females. They had lowest values on consumers' attitude and trust toward the life insurance industry, and placed less importance on product attributes. Cluster 3 was consumers with high income and around 53% of them were males. They cared less regarding consumer attributes. Results of cluster analysis revealed that Chinese consumers in each cluster have differences in purchasing criteria and socio-demographic characteristics.

This study provided some insights into the major factors that are important for Chinese consumers regarding life insurance. Results of factor analysis indicated that the importance of product attributes is the most important factor affecting Chinese consumers' ownership of life insurance. Therefore, insurance companies and regulators may wish to focus on product attributes in developing marketing strategies and regulation improvement. Second, results of cluster analysis provided important characteristics and information on Chinese consumers. Insurance companies may wish to focus more on these characteristics in order to target the "right" potential consumers in future.

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