An Analysis of the Present Situation and Influencing Factors of Property Insurance

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Abstract—**Since the reform and opening up, especially after China's accession to the WTO, insurance has entered a new historical development period in China. As a branch of commercial insurance, property insurance still has great potential for development under the current economic situation. Firstly, this paper analyzes the present situation of property insurance in China, Then, combining with econometrics, statistics and other related theories and using log linear multiple regression model, this paper tries to find out the factors affecting China's property insurance demand, and the results show that the per capita disposable income of urban residents has a greater impact on the property insurance density in different regions.**

Keyword—*Property insurance; Elasticity; Log linear multiple Regression model; Influence factors*

I. INTRODUCTION

Objectively, property insurance is now meeting the needs of various risk protection (In addition to the body and life of a natural person), It is an indispensable economic compensation system for the development of contemporary society. The purpose of this paper is to find out the factors that influence the development of property insurance industry. Maria Teresa Medeiros Garcia [1] tried to find out the relationship between property-liability insurance premiums and economic and financial development in the case of Portugal, The paper conducts OLS estimations , The results show that the level of the gross domestic product is the only factor explaining the level of property-liability insurance demand in Portugal.J. David Cummins and RichardA. Derrig [2] illustrated the use of FST, The results indicate that FST can lead to significantly different decisions than the conventional approach. Zhen YANG, Junwen FENG [3] analyzed the connotation of sustainable development ability; determines three main factors (capability resources, capability level and capability environment) and their sub-factors, lays out the structural model of the sustainable development capability of property insurance enterprises. In this model, capability environment is the basis and capability resources and capability level are the pillars.

II. OVERVIEW OF PROPERTY INSURANCE

A. The concept and characteristics of property insurance

Property insurance takes all kinds of property, materials and related interests as the object of insurance, It is a kind of socialized economic compensation system that compensates the economic loss of the insured.

The characteristics of Property insurance are as follows(1)Diversity of objects(2)The particularity of insurance object(3)The particularity of insurance interest(4)The particularity of determining the amount of insurance(5)The particularity of insurance period(6)The particularity of insurance contract.

B. Comparison of insurance density of property insurance

Premium income is a holistic concept, and the insurance density is a concept of per capita. It marks the development of regional insurance business, It also reflects the situation of economic development and the awareness of insurance in the region, Therefore, it shows the popularity of insurance related knowledge. generally speaking, the index of insurance density is greater, The development of insurance industry in the region is better, The popularity of insurance knowledge is higher.

The calculation formula of insurance density is as follows:

Insurance density= Annual insurance income in the region/ The number of resident population in the region

In 2015, the density of property insurance in each region and the rankings were shown in table 1.

TABLE I   THE DENSITY OF PROPERTY INSURANCE IN EACH REGION AND THE RANKINGS IN 2015[a]

Name of region	Density of property insurance (yuan)	ranking	Name of region	Density of property insurance (yuan)	ranking
Beijing	1566.43	1	Shanxi	470.48	17
Shanghai	1471.46	2	Jilin	452.9	18
Zhejiang	1104.64	3	Anhui	444.95	19
Jiangsu	842.74	4	Qinghai	443.88	20
Tianjin	777.53	5	Shanxi	435.01	21
Guangdong	689.01	6	Yunnan	424.28	22
Ningxia	614.03	7	Hubei	407.59	23
Xinjiang	605.78	8	Guizhou	376.22	24
Inner Mongolia	594.5	9	Hunan	358.56	25
Fujian	577.07	10	Heilongjiang	348.65	26
Liaoning	563.15	11	Gansu	347.36	27
Hebei	538.05	12	Tibet	343.83	28
Sichuan	513.15	13	Henan	339.3	29
Chongqing	512.04	14	Guangxi	306.8	30
Hainan	486.13	15	Jiangxi	305.46	31
Shandong	480.69	16			

[a.] Data source: China Insurance Yearbook

[b.]

As shown in table 1, The average density of property insurance in China was 572.3119 yuan in 2015, Insurance density in Beijing, Shanghai and Zhejiang is the top three, Henan, Guangxi and Jiangxi are the latter three, The insurance density is less than 340 yuan, The density of property insurance in Beijing is 1566.43 yuan, It ranks first, Therefore, the development of insurance industry in Beijing is relatively mature, People have strong awareness of insurance, The popularity of property insurance is also high, The density of property insurance is higher than the average in 10 regions, The index is greatly influenced by demographic factors, Such as Xinjiang, If you only focus on the premium income of property insurance, the ranking is back, However, the ranking of insurance density is relatively high, The reason may be that the population of Xinjiang is relatively small.

C. Comparison of insurance depth of property insurance

Insurance depth refers to the ratio of premium income to the gross domestic product (GDP) in the region, It reflects the position of the insurance industry in the whole national economy. The insurance depth depends on the overall economic development level of a country and the development speed of insurance industry. Generally speaking, The greater the index of insurance depth, It shows that in the process of regional economic development, The insurance industry has made a great contribution to economic growth.

In 2015, the depth and rank of property insurance in different areas are listed in Table 2 below:

TABLE II   IN 2015, THE DEPTH OF REGIONAL PROPERTY INSURANCE AND ITS RANKING[b]

Name of region	Depth of property insurance (%)	ranking	Name of region	Depth of property insurance (%)	ranking
Xinjiang	1.53	1	Liaoning	1	17
Zhejiang	1.5	2	Shanxi	1	18
Beijing	1.48	3	Chongqing	0.98	19
Yunnan	1.45	4	Jiangsu	0.96	20
Shanghai	1.42	5	Fujian	0.89	21
Ningxia	1.41	6	Heilongjiang	0.89	22
Sichuan	1.4	7	Jiangxi	0.88	23
Hebei	1.34	8	Guangxi	0.88	24
Gansu	1.33	9	Henan	0.86	25
Guizhou	1.26	10	Hunan	0.84	26
Shanxi	1.24	11	Jilin	0.84	27
Guangdong	1.21	12	Inner Mongolia	0.83	28
Anhui	1.21	13	Hubei	0.81	29
Hainan	1.2	14	Shandong	0.75	30
Tibet	1.09	15	Tianjin	0.73	31
Qinghai	1.08	16			

[c.] Data source: China Insurance Yearbook

As shown in table 2, The average depth of property insurance in China was 1.1061% in 2015. The insurance depth of Xinjiang, Zhejiang, Beijing, Yunnan, Shanghai, Ningxia, Sichuan, Hebei, Gansu, Guizhou, Shanxi, Guangdong, Anhui and Hainan is higher than the average level in China, Hubei, Shandong and Tianjin are in the latter three.

The insurance depth in Beijing is 1.48%, ranking third, This shows that in the process of economic growth, The contribution of insurance industry to economic growth in Beijing is relatively large, But the insurance depth in Beijing is only about 0.38 percentage points higher than the average in china, This explains, Even if in areas where the economy is booming, Property insurance still has a lot of room for improvement, There are also many aspects to be perfected.

D. The influence of gross domestic product on the premium income of property insurance companies

Regional gross domestic product (100 million yuan): The final results of production activities in a given period of time by all the resident units in the region.

The change of property insurance demand caused by the change of GDP can be expressed by the elasticity , Such as formula (1).

$$E_m = \frac{\Delta Q / Q}{\Delta I / I} \qquad (1)$$

Among them: E_m represents the elasticity of income, Q represents the premium income of the property insurance, I represents total value of GDP

TABLE III   ELASTICITY TABLE OF PREMIUM INCOME OF PROPERTY INSURANCE COMPANY[c]

years	Gross Domestic Product (100 million yuan)	GDP growth rate (%)	Property insurance company's premium income (100 million yuan)	Premium income growth rate of property insurance companies (%)	The elasticity of premium income of property insurance companies to GDP
2001	110863.1		691		
2002	121717.4	0.097907	772	0.117221	1.19727
2003	137422	0.129025	866	0.121762	0.943705
2004	161840.2	0.177688	1125	0.299076	1.683156
2005	187318.9	0.157431	1284	0.141333	0.897747
2006	219438.5	0.17147	1581	0.231308	1.348972
2007	270232.3	0.231472	2087	0.320051	1.382677
2008	319515.5	0.182373	2446	0.172017	0.943214
2009	349081.4	0.092534	2993	0.22363	2.41675
2010	413030.3	0.183192	4027	0.345473	1.885851
2011	489300.6	0.18466	4779	0.18674	1.01126
2012	540367.4	0.104367	5530	0.157146	1.505705
2013	595244.4	0.101555	6481	0.171971	1.693379
2014	643974	0.081865	7544	0.164018	2.00352
2015	685505.8	0.064493	8423	0.116516	1.806653

[d]. Data source: China Insurance Yearbook

According to the relevant data, The calculation results are shown in Table 3, The results show that in addition to individual years, The value of elasticity is greater than 1, On the whole, it's resilient, Property premium income will increase significantly with the growth of GDP.

III. ANALYSIS OF PROPERTY INSURANCE DEMAND BASED ON ECONOMETRIC MODEL

A. The determination of independent variable

Among the economic indicators, I've chosen some indicators that are closely related to property insurance, As follows:

Unemployment rate (%);Financial revenue (100 million yuan); Green coverage rate of built-up area (%);Per capita net income of farmers (yuan); Proportion of urban population at the end of the year (%);Final consumption expenditure (100 million yuan); Per capita disposable income of urban residents (yuan); Regional GDP (100 million yuan)

To determine whether the above factors can have a significant impact on the density of property insurance, Next, I use stepwise regression to choose:

TABLE IV   COEFFICIENT

	Model	Non standardized coefficient		Standard coefficient	t	Sig.
		B	Standard error	Trial version		
1	(constant)	-599.143	84.410		-7.098	.000
	Per capita disposable income of urban residents (yuan)	.040	.003	.936	14.272	.000
2	(constant)	-653.029	81.880		-7.975	.000
	Per capita disposable income of urban residents (yuan)	.044	.003	1.041	13.725	.000
	Financial revenue (100 million yuan)	-.025	.011	-.177	-2.339	.027
3	(constant)	-726.802	83.842		-8.669	.000
	Per capita disposable income of urban residents (yuan)	.037	.004	.884	8.762	.000
	Financial revenue (100 million yuan)	-.026	.010	-.181	-2.539	.017
	Proportion of urban population at the end of the year (%)	4.798	2.186	.203	2.195	.037

The selected factors are respectively: x_1 represents financial revenue (100 million yuan), x_2 represents proportion of urban population at the end of the year (%), x_3 represents per capita disposable income of urban residents (yuan)

B. The establishment of the model

The disturbance of multicollinearity has been reduced in the stepwise regression process mentioned above, Log multiple linear regression model was selected, Not only because it can overcome a certain degree of multicollinearity, It also reflects when a variable changes 1%, The change of another variable.

$$\ln ny = \beta_1 \ln x_1 + \beta_2 \ln x_2 + \beta_3 \ln x_3 + \mu$$

(2)

Among them, y represents density of property insurance (yuan), x_1 represents financial revenue (100 million yuan), x_2 represents proportion of urban population at the end of the year (%), x_3 represents per capita disposable income of urban residents (yuan), μ represents random disturbance term

Regression of sample data using Eviews:

TABLE V   THE RESULT OF REGRESSION

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(X2)	0.635416	0.208643	3.045475	0.0051
C	-10.87502	1.880447	-5.783208	0.0000
LOG(X3)	1.493280	0.231988	6.436882	0.0000
LOG(X1)	-0.097969	0.044059	-2.223569	0.0347
R-squared	0.837867	Mean dependent var		6.253258
Adjusted R-squared	0.819852	S.D. dependent var		0.413504
S.E. of regression	0.175507	Akaike info criterion		-0.522365
Sum squared resid	0.831670	Schwarz criterion		-0.337335
Log likelihood	12.09666	Hannan-Quinn criter.		-0.462050
F-statistic	46.51007	Durbin-Watson stat		1.314841
Prob(F-statistic)	0.000000			

From table 4, Adjusted R-squared is greater than 0.8, The overall fitting degree of the equation is better, By F statistics, The equation is significant on the whole, The P values of each variable were less than the significant level of 0.05, Zero

hypothesis is rejected, It is shown that the independent variables of the equation are significant.

C. Model testing

In order to build a high quality model, The heteroscedasticity of the equation is tested:

White's general variance test was used, There are 3 independent variables in the model, The auxiliary regression model is as follows:

$$\tilde{e}_i^2 = \alpha_0 + \alpha_1 lnx_{1i} + \alpha_2 lnx_{2i} + \alpha_3 lnx_{3i} + \alpha_4 \left(\ln x_{1i}\right)^2 + \alpha_5 \left(\ln x_{2i}\right)^2 +$$
$$\alpha_6 \left(\ln x_{3i}\right)^2 + \alpha_7 lnx_{1i}lnx_{2i} + \alpha_8 lnx_{1i}lnx_{3i} + \alpha_9 lnx_{2i}lnx_{3i} + \varepsilon_i$$

$$(3)$$

Among them, $\tilde{e}_i^{\,2}$ represents the square of the residuals of the model, ε_i represents random error term

The output is shown in table 4:

TABLE VI   Heteroskedasticity Test: White

F-statistic	0.504358	*Prob. F(9,21)*	0.8549
Obs*R-squared	5.509799	*Prob. Chi-Square(9)*	0.7878

The value of p is greater than 0.05 for the significance level, It is preliminarily believed that the model does not exhibit heteroscedasticity.

So the model can be expressed as

$$lny = -10.87502 - 0.097969 \ln x_1$$
$$+ 0.635416 \ln x_2 + 1.493280 \ln x_3$$

IV. Conclusion

The density of property insurance premiums has a negative correlation with Revenue, The elasticity is -0.097969, The absolute value of elasticity is close to 0, That is to say, the growth of financial revenue has little effect on the density of property insurance. One reason is that financial revenue includes a variety of income, financial revenue can only explain the level of economic development of the country as a whole, Its increase or decrease have little influence on the development of insurance industry; Another reason is that the density of property insurance is a concept of per capita, Even if property premiums will vary substantially with the growth of financial revenue, But there are so many people in China, After average, the change of the premium density will not be obvious.

The density of property insurance has a positive correlation with the proportion of urban population at the end of the year. The elasticity is 0.635416, That is to say, the proportion of urban population increased by 1% at the end of the year, The premium density of property insurance increased by 0.635416 percentage points. The education level of urban population is higher, Their income and living standards are mostly moderate or better, The ability to accept new things is stronger, In areas with a large proportion of urban population, People pay more attention to financial management, Insurance coverage and approval rates will also be higher, Therefore, the consciousness of insurance is stronger.

The density of property insurance is positively related to the per capita disposable income of urban residents. The elasticity is 1.493280, That is, the per capita disposable income of urban residents increased by 1%, The density of property insurance increased by 1.493280 percentage points. The per capita disposable income of urban residents reflects that the total cash income of residents can be used to arrange the income of family daily life, This factor has the most significant effect on the premium density of property insurance, The areas with high per capita disposable income of urban residents, In terms of finance, public services, education and health care, their development is relatively mature, Residents in these areas have a deeper sense of insurance, They can take the initiative to buy the insurance they need, So the density of property insurance will be affected.

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