Sensitivity Analysis on Invisible Demand of Insurance Products

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Abstract: On the background of studying invisible demand deeply, we draw on the different research areas of invisible demand from the relevant researches of domestic and foreign scholars. In this paper we analyze the comparative difference between insurance products and tangible products from the three perspectives, flexibility and ambiguity and synchronization, highlighting the invisible of insurance products. We then do the correlation analysis and the regression analysis between insurance products and income and consumption. We find that people often tends to keep the consumption of insurance products with income rising, owing to revenue reaching a certain level and avoiding to the desire risk stronger. Finally, new insurance products based on invisible demand will be produced to meet people's demand continuously.

Keywords: invisible demand, insurance products, regression analysis, correlation analysis

1 Introduction

The invisible demand research of Chinese scholars were scattered in different areas of research and documentation, and this research gradually has formed a relatively area of study and research context in current. Many insurance companies realize that customer often fail to express their demands clearly. Wang Baoxin(2003) believed that there is a large number of invisible demand for the customer except the profiling demand. Especially the invisible demand of the custom is more potential, so it has ability to pay and impulsivity shopping belongs to invisible demand or semi-invisible demand. Luo Yongtai (2006) put forward the product based on the depth of the development, which will help enterprises take full advantage of consumer invisible resources demand.

The variation and evolution of the invisible demand research of foreign scholars is understanding earlier, Keith Goffin Fred Lemke(2005) believed that sometimes customers do not comprehend what their demands, that is, consumers or users only have not directly cognizant for their demands. Because these requirements are the awareness level, users can not clearly express these demands. Adrian Slywotzky, Richard Wise, Karl Weber (2005) proposed the origin of innovation was grasping the invisible demand of customer. Enterprises must understand the existing product and service related field which customers spend more time and money, and “demand innovation” creates new profits.

From the above Literatures, we can see that there are many scholars to research on the invisible demand based on not quantitative analysis of combined data but the theoretical analysis mostly. Therefore, this article aims to use combination methods of qualitative and quantitative to of study invisible demand for insurance products.

2 The Comparative Analysis of Insurance with Tangible Products

2.1 Owing to Greater flexibility in product quality

Tangible products can be mass-produced through the labour. The different production materials, different production process, different production technologies level can lead to differences in product quality, after all, there is a measure standard. The same product can also be used, identified, distinction. Whether the insurance product is a good or not can be difficult to measure by its service quality.

2.2 The ambiguity of former products consumption

People buy products before we can do a certain understanding such as debugging, touch, some manufacturers also sell a number of days to make the promise of a trial, so that the consumer product has a clearer under-

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standing in order to help to make the final purchase decision, so that consumers have a clearer understanding for products which help people to make purchase decisions. Although people have an understanding for the insurance products before buying, the consumer can not touch it and watch its shape, therefore, there are a lot of ambiguity before making decisions.

2.3. The synchronization process of the production and consumption

Tangible products have the production, storage, transportation, sales and so on. This process has the production behavior for manufacturers, transport, storage behavior and the sale behavior for businesses, thus expanding the product contact surface and the sphere of influence. Insurance products a service process which are offered by the seller to the buyer, the production process is the consumption process. The synchronization of the two limits the sphere insurance products. The scale and geographical scope of the insurance products have limitations in the competition.

In the purchase of tangible products, the ownership has transferred. After the purchase, consumers can transfer the product to others and if consumers are not satisfied with the event and can also be changed back. The transfer of ownership rights does not occur in the purchase of insurance products in and the transfer rights will no longer go out. It will be difficult to change if the consumer is not satisfied with the products.

3 The Quantitative Analysis of Invisible Demand of Insurance Products

With the level of personal incomes rising, people's consumption is also rising. In the past, people only focused on the food issue and clothing well-being, and now constant pursuit the spiritual demand, then which led the development of related services. The insurance industry is a kind of essential demand and the demand is also constant to increase. It is different from ordinary products, after the payment you buy a stable psychological and a kind of risk.

3.1 Data selection

We mainly research the invisible demand of insurance products in this paper. Because the invisible demand is difficult to measure in practice and profiling demand is shift from invisible demand, we selected profiling demand to replace invisible demand. In this paper, we select the retail price index (RETAIL), per capita disposable income (INCOME) as the consumption and income level of people and select premium income (BAOFEI) as the insurance consumption for consumers. These three indicators are based 1978 = 100 as the base period index. According to the National Bureau of Statistics website, we get the data interval time which is 1985, 1990, from 1993 to 2007. The data are as follows:

Table 1: Data indicators from 1985 to 2009

YEAR	BAOFEI	INCOME	RETAIL
1985	192.3	160.4	128.1
1990	1200.0	198.1	207.7
1993	3507.7	255.1	254.9
1995	2892.3	276.8	310.2
1997	3484.6	290.3	356.1
1998	4138.5	301.6	377.8
1999	5938.5	311.9	380.8
2000	9661.5	329.9	370.9
2001	10815.4	360.6	359.8
2002	12292.3	383.7	354.4
2003	16223.1	416.3	351.6
2004	23492.3	472.1	347
2005	29846.2	514.6	346.7
2006	33215.4	554.2	356.4
2007	37938.5	607.4	359.3
2008	43384.6	670.7	362.9
2009	54123.1	752.3	376.7

3.2 Correlation analysis

Using EViews3.1 software according to the data in Table 1, we process the correlation analysis for the level of premiums respectively, consumption and income (INCOME). The results are as follows:

Table 2: The related degree among indicators

CORR	BAOFEI	INCOME	RETAIL
BAOFEI	1.0000	0.9864	0.4566
INCOME	0.9864	1.0000	0.5858
RETAIL	0.4566	0.5858	1.0000

From Table 2 we find that the relevant degree of the premium income and per capita disposable income is 0.9864, while the related level of the consumption level and per capita disposable income is 0.5858; this shows that with the income levels rising, people tend to keep consumption of insurance products, while consumption of other products do not increase greatly. This is mainly because the income higher, the risk awareness stronger and the insurance products consume more.

3.3 Regression analysis

Premium income as the interpreted variable, personal income levels, the retail price index as explanatory variables for regression, the regression results are as follows:

Table 3: the regression model of premium level

Dependent Variable: BAOFEI

Method: Least Squares

Date: 06/17/09 Time: 10:48

Sample(adjusted): 1991 2009

Included observations: 17 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INCOME	108.8407	2.223533	48.94943	0.0000
RETAIL	-44.73793	5.418658	-8.256276	0.0000
C	-11957.34	1484.072	-8.057115	0.0000

R-squared	0.995402	Mean dependent var	17196.8
Adjusted R-squared	0.994745	S.D. dependent var	16734.4
S.E. of regression	1213.076	Akaike info criterion	17.1984
Sum squared resid	20601735	Schwarz criterion	17.3455
Log likelihood	-143.1872	F-statistic	1515.42
Durbin-Watson stat	1.423726	Prob(F-statistic)	0.00000

Table 4: Autocorrelation test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.995125	Probability	0.056793
Obs*R-squared	6.795025	Probability	0.078456

Table 5: White test

White Heteroskedasticity Test:

F-statistic	0.202972	Probability	0.931873
Obs*R-squared	1.077287	Probability	0.897859

According to the P value from Table 3, we can see that the estimated values of coefficients of explanatory variables are significantly non-zero (95% confidence level). By the adjusting goodness-of-fit R^2 is 0.99 which shows that premium indicators have been to explain the extent of 99%. The result is relatively excellent. From Table 4 and Table 5, P value is shown in the conditions of 95 percents confidence level, the model has not heteroscedasticity and autocorrelation. So we draw with the regression relationship of premium, income and the consumption level. The formula is as follows:

$$BAOFEI = 108.84INCOME - 44.74RETAIL - 11957.34 \quad (1)$$

From the formula (1) we can see that the level of personal income increases one unit, the premium level increases 108.84 units, which fully reflects when people reach a certain income level, people dislike risk. The more risk-averse insured, he hopes to pay higher insurance premiums. We purchase the insurance to avoid unnecessary risks and increase the security sense.

The relation is negative between the consumption level and insurance products. The consumer price index increases one unit, the premium level decreases 44.74 units, which shows that in some cases revenue, increasing consumption of insurance is bound to reduce consumption of other products. The above model studied the consumption of insurance products needs through profiling demand, but profiling demand is conversed by invisible demand, which means profiling consume greater, the invisible demand of insurance products consume greater.

It should be noted that our model is built on the small samples. Because of limited data, the model does not fully reflect the reality. The invisible demand of in-

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surance products is difficult to directly quantify, so the model needs further improvement.

4 The Depth Development Insurance Products Based on the Invisible Demand

4.1 The innovation mechanism of making invisible demand into the product

In the process of invisible demand transforming to profile demand, we can use the function of product to subdivide different demands for customs and develop a series of product features. The ultimate goal of insurance product development is to meet the demand of customer. It is clear that multi-functional products meet the diverse demands is beneficial for both producer and consumer. We must consider a variety of invisible demand elements, select features to meet different individual demand, and translate them into new products. When the product innovation meets customer demand for the time being, with the popularity of such products and enhancements of product functionality of customer awareness, customers have recreated a new invisible requirement, which prompts a new round of insurance product development of production enterprises.

4.2 The new product development based on the selection demand

Most of invisible demand has not been exploited for service, so carrying out this property will make customers surprised extremely. But new products exploitation is also difficulty and there are potential risks of new products exploitation. Therefore, the insurance companies must also take fully into the risk of selection of insurance product development. In the new product development process, we do not only pay attention to customer changing demands, but also to the characteristics of rival products, and adjust the development strategy at any time on the above characteristics.

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