



Analysis on the Influencing Factors of Demand for Commercial Health Insurance

Xiaohan Wang^(✉)

City University of Hong Kong, Hong Kong, China
xwang2447-c@my.cityu.edu.hk

Abstract. The Healthy China strategy has made the concept of health increasingly popular and also promoted the progress of China's insurance industry, especially the development of health insurance. However, the comprehensive development level of China's commercial health insurance industry is still far behind that of developed countries, and there is still a long way to go for China's insurance industry. This essay focuses mostly on the affecting factors of the demand for commercial health insurance. The explained variable in this paper is the premium income of China's commercial health insurance, and its influencing factors the per capita disposable income of urban residents, the proportion of government medical and health expenditure in fiscal expenditure, the insurance depth, the aging rate, and the urbanization rate are set as the explanatory variables, and a regression model is established. The empirical study demonstrates that the commercial health insurance premium income is positively correlated with per capita disposable income of urban residents and insurance depth, and negatively correlated with the proportion of government medical and health expenditure in fiscal expenditure. Finally, this paper concludes with some useful policy suggestions.

Keywords: Commercial health insurance · Insurance demand · Influencing factors · Suggestions · OLS · Regression analysis

1 Introduction

With the continuous rise of people's living standards, the demand for more comprehensive and multi-level medical insurance is increasing. Commercial health insurance plays an important role nowadays. Commercial health insurance can realize the docking and supplement of basic medical insurance and protect people's health. The healthy development of relations is a suitable incentive mechanism. For individuals and families, commercial health insurance can help reduce the family's financial burden caused by significant illnesses. For companies and units, commercial health insurance is part of the employee welfare system, promoting the relationship between the company and employees. For the country and society, the absence of social insurance can be made up for by commercial health insurance, which can also benefit the nation's medical security system. Consequently, the growth of commercial health insurance is crucial.

Since 2001, driven by national policies and the diversification of health needs, the commercial health insurance industry in China has been overgrown. A commercial health

insurance market with a specific market size and increasingly diversified supply entities has initially formed, extensively promoting the growth of the medical and health protection system. Moreover, a multi-level medical care system with basic medical insurance as the main body and other types of supplementary insurance and commercial insurance as supplements is also necessary, according to the "Healthy China 2030" planning framework. In recent years, commercial health insurance has made particular contributions to improving medical insurance operation efficiency and service quality. Therefore, commercial health insurance has bright development prospects and broad development space. The development of commercial health insurance needs to be vigorously promoted.

Due to its large population and high population density, China has created a favorable environment for the growth of health insurance, creating a vast potential market. Besides, the healthy China strategy has also created a suitable environment for developing China's commercial health insurance. 1.36 billion people participated in China's basic medical insurance in 2020, and the total income of basic medical insurance was 2484.6 billion yuan. Commercial health insurance achieved a premium income of 817.3 billion yuan, with an annual growth rate of 15.67%, accounting for 32.9% of the country's total insurance premiums. Commercial health insurance has become the fastest-growing type of the insurance in China. In light of the aforementioned context, this article uses China as its research subject to examine the variables that affect the demand for China's commercial health insurance and support the industry's great development trajectory.

2 Literature Review

Regarding the elements influencing demand for commercial health insurance, many foreign scholars have conducted research. Thorsten Beek and Ian Webb's research shows a significant correlation between the demand for health insurance and the inflation rate, as well as the per capita income level of residents [1]. Insurance demand is positively impacted by inhabitants' per capita income levels, while it is negatively impacted by inflation rates. The research of Jonneke Bolhaar and Maarten Lindeboom also shows that the income level of residents can significantly affect the need for health insurance [2]. According to Ahmed Khwaja, there is a positive correlation between the need for commercial health insurance and the aging society [3]. In terms of empirical analysis, Chinese researchers Liu Fangfang and Wang Xiuhua demonstrate that the growth of commercial health insurance could be facilitated by urban residents' increased per capita disposable income and increased insurance awareness [4]. By comparing China's different region's commercial health insurance premium income [5], Li Qiong finds out that the residents' disposable income, the availability of health insurance, and the degree of social and economic development are the primary variables impacting the premium income of commercial health insurance. According to Xu Yan's research, residents' purchasing capacity, the rate of population aging, the depth of insurance, and people's awareness of insurance are the primary factors influencing the demand for health insurance. [6]. Liu Hong analyzes the factors from both macro and micro perspectives and puts forward that the elements affecting the demand for commercial health insurance include personal risk appetite and residents' economic purchasing power [7].

Generally, the relevant research by domestic and foreign scholars has shown that income, population aging, and demand for commercial health insurance are positively

correlated [8], and the purchase of medical social insurance is negatively correlated with the demand for commercial health insurance. Besides, the article will introduce more variables, such as consumers' purchasing intention, urbanization rate, and residents' disposable income, as independent variables to analyze the factors that affect the demand for commercial health insurance.

3 Research Hypothesis

The number of goods consumers are willing and able to purchase at a given price level is related to consumers' willingness to buy and the ability to pay. Willingness to buy and ability to pay are also closely associated with various economic and social factors. For the factors influencing consumers' willingness to purchase and ability to pay, this paper makes the following assumptions.

3.1 Purchase Intention Assumptions

The main factors influencing consumers' willingness to purchase are the depth of the insurance and the aging rate. The depth of insurance can reflect the level of the insurance industry and the insurance awareness of local residents in that particular region. All else being equal, the greater the depth of insurance, the higher the level of the insurance industry in the area, the stronger the residents' willingness to purchase insurance, and the greater the residents' demand for commercial health insurance. The aging rate is the share of the elderly population in the total population in a given area. As people grow older, the risk of various diseases increases. The prospective demand for and willingness to obtain commercial health insurance will consequently be higher among seniors.

Hypothesis 1: The greater the depth of insurance in a region, the higher the demand for commercial health insurance.

Hypothesis 2: The higher the aging rate of a region, the higher the demand for commercial health insurance.

3.2 Ability to Pay Assumptions

The main factors affecting consumers' ability to pay are disposable income and the urbanization rate. The higher the disposable income of the residents, the stronger the consumers' ability to pay, the stronger the purchasing power of commercial health insurance, and the greater the demand for commercial health insurance. The urbanization rate represents the level of urbanization of a region. The higher the urbanization rate, the higher the income level of people and the higher the disposable income of residents, which means the greater the demand for commercial health insurance. It should also be noted that consumer demand for a good is influenced by other related goods, including complementary goods and substitutes. Goods that can replace each other in terms of use value are referred to as substitutes, whereas complementary products can complement one another in terms of use value. The price and demand move in the same direction between two substitutes and the opposite direction between two complements. To some degree, social health insurance is a substitute for commercial health insurance. The local

level of social health insurance is shown by the ratio of health care expenditure to the fiscal expenditure of the government in a certain region. The higher the proportion of health care expenditure to fiscal expenditure, the stronger the level of social health insurance, and the more people demand for social health insurance. As a substitute, there will be less demand for commercial health insurance.

Hypothesis 3: The higher the disposable income of a region's residents, the higher the demand for commercial health insurance in that region.

Hypothesis 4: The higher the urbanization rate of a region, the higher the demand for commercial health insurance among people in that region.

Hypothesis 5: The greater the share of government health care spending in fiscal spending in a region, the lower the demand for commercial health insurance among people of that region.

4 Research Design

4.1 Sample Selection and Data Sources

This paper selects the relevant economic data of China from 2002 to 2020 as the research sample. This essay mainly studies the influence of five factors on the demand for commercial health insurance: per capita disposable income of urban residents, the proportion of government medical and health expenditure in fiscal expenditure, insurance depth, aging rate, and urbanization rate. The study period spans from 2002 to 2020 due to data availability. The data used in this research comes from two sources: the Statistical Communiqué of The People's Republic of China on the 2020 National Economic and Social Development (National Bureau of Statistics of China, 2020), and the China Statistical Yearbook (National Bureau of Statistics of China, 2003–2021), and <https://m.gotohui.com/>.

4.2 Variable Selection

Explained Variable:

Y: The premium income of commercial health insurance. The premium income of commercial health insurance in China is set as the explained variable. People's effective demand for commercial health insurance can be reflected in the premium income of commercial health insurance [9]. Therefore, this paper takes the premium income of commercial health insurance as an indicator to measure the demand for commercial health insurance.

Explanatory Variables:

X1: Per capita disposable income of urban residents. Household disposable income is the main factor affecting consumption. If disposable income increases, consumption will increase, and the purchase of commercial health insurance will increase; that is, the premium income will also increase, and vice versa. Sales of commercial health insurance are mainly concentrated in cities and towns, so choosing the per capita disposable income of urban residents is more realistic.

X2: The proportion of government medical and health expenditure in fiscal expenditure. The proportion of government medical and health expenditure in fiscal expenditure

reflects the level of social medical insurance. Social medical insurance, to some extent, is an alternative to commercial health insurance. The higher the level of social health insurance, the less the need for commercial health insurance. Therefore, the greater the proportion of government medical and health expenditure in fiscal expenditure, the smaller the demand for commercial health insurance.

X3: Insurance depth. Insurance depth is the ratio of premium income to GDP. Insurance depth reflects the status of the local insurance industry in the whole national economy, and also reflects the development level of the local insurance industry and the insurance consciousness of local residents [10]. When other conditions remain unchanged, the greater the insurance depth, the stronger the residents' insurance awareness. Therefore, the greater the insurance depth, the greater the need for commercial health insurance.

X4: Aging rate. The aging rate refers to the proportion of the population aged 65 and above [11]. The older people get, the higher their risk of various diseases and the more they spend on health care [12]. In other words, the demand for commercial health insurance will be higher among older groups. Therefore, the higher the aging rate, the greater the demand for commercial health insurance.

X5: Urbanization rate. It reflects the level of urbanization. Compared with rural areas, urban residents are generally more health conscious and have higher incomes. It is generally believed that the higher the urbanization rate, the higher the demand for commercial health insurance.

4.3 Model Selection

The explained variable in this study is the premium income of China's commercial health insurance, and its influencing factors are set as the explanatory variables, and then the multiple linear regression model is created in light of this.

$$Y = C + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon \quad (1)$$

where Y stands for the explained variable, X for the explanatory variable, ε for the random error term, and C for the constant term.

5 Research Process

5.1 Descriptive Analysis

Descriptive statistics mainly include Mean, Median, Maximum, Minimum, Std. Dev, etc. According to the descriptive statistical results, the maximum value of explained variable Y is 705.85 billion yuan, the minimum value is 12.1 billion yuan, the mean value is 183.727 billion yuan, and the median value is 63.17 billion yuan. The median value is less than the mean value, indicating that the distribution of Y is uneven and the overall trend is to the right. The Std. Dev. is large, indicating that there is a great difference between the data (Table 1).

Table 1. Descriptive statistics of each variable [self-drawn]

	Y	X1	X2	X3	X4	X5
Mean	1837.27	23322.09	0.05	0.03	0.10	0.51
Median	631.70	21809.80	0.06	0.03	0.09	0.51
Maximum	7058.50	43833.76	0.08	0.04	0.17	0.64
Minimum	121.00	7702.80	0.03	0.03	0.07	0.39
Std. Dev.	2213.77	12000.74	0.02	0.01	0.02	0.07

Table 2. Correlation analysis results [self-drawn]

correlation	Y	t-Statistic
Y	1.00	–
X1	0.90	8.64
X2	0.77	5.00
X3	0.90	8.73
X4	0.82	6.02
X5	0.86	6.82

5.2 Correlation Analysis

The correlation coefficient between explanatory variables such as per capita disposable income of urban residents, insurance depth, urbanization rate, and the premium income of commercial health insurance are all very high. The explanatory variables' t values are all higher than the critical value, which means that the explained variable and the explanatory variables have a significant correlation (Table 2).

5.3 Regression Analysis

We estimate the parameters using the OLS method and the EViews software. Table 3 displays the regression model's results.

From the model regression results, we can see that the $R^2 = 0.97$ and the adjusted $R^2 = 0.95$, both extremely close to one, which shows that this model fits the economic data very well.

$K - 1 = 5$, $n - k = 13$, $\alpha = 0.05$, $F_{\alpha}(5,13) = 3.03$. It can be seen from Table 4 that the F value of this model is $F = 72.24$, which is greater than 3.03. So we should reject the null hypothesis. There is a significant linear relationship between the variables, as indicated by $P = 0.00 < 0.05$. The following are the T-test findings (Table 5).

$\alpha = 0.05$, $t_{\alpha/2}(n - k) = 2.16$; Only 3.72 and 4.42 and 3.31 are greater than 2.16. That is, only the per capita disposable income of urban residents, the proportion of government medical and health expenditure in fiscal expenditure, and the insurance

Table 3. Model regression results [self-drawn]

Variable	Coefficient	t-Statistic
C	-2672.65	-0.50
X1	0.28	3.72
X2	-151316.35	-4.42
X3	139836.49	3.31
X4	8217.38	0.86
X5	1243.14	0.08

Table 4. R2 and F test results

R ²	Adjusted R ²	F-Statistic	Prob (F-statistic)
0.97	0.95	72.24	0.00

Table 5. T-test results [self-drawn]

Variable	t-Statistic	Prob.
C	-0.50	0.63
X1	3.72	0.00
X2	-4.42	0.00
X3	3.31	0.01
X4	0.86	0.41
X5	0.08	0.94

depth have significant effects on the premium income of commercial health insurance, while the aging rate and urbanization rate have no significant effects on the premium income of commercial health insurance. Next, the multicollinearity test is performed on the model. The VIF test findings indicate that the original model has significant multicollinearity because the VIF of X1, X2, and X5 are all larger than ten.

Consequently, the model needs to be modified. The logarithmic transformation of each variable is taken into consideration, and the below model is then set up to remove the impact of multicollinearity and prevent setting mistakes brought on by the exclusion of significant explanatory variables:

$$\begin{aligned} \text{LOG}(Y) = & C + \beta_1\text{LOG}(X_1) + \beta_2\text{LOG}(X_2) + \beta_3\text{LOG}(X_3) \\ & + \beta_4\text{LOG}(X_4) + \beta_5\text{LOG}(X_5) + \varepsilon \end{aligned} \quad (2)$$

Table 6. Model regression results [self-drawn]

Variable	Coefficient	t-Statistic
C	-20.71	-0.84
X1	2.85	1.48
X2	-3.61	-3.62
X3	2.61	3.08
X4	0.74	0.97
X5	1.27	0.18

Table 7. Stepwise regression results [self-drawn]

Variable	Coefficient	t-Statistic
C	-28.25	-3.03
X1	3.43	5.75
X2	-3.82	-4.15
X3	3.05	4.47

Table 8. R² and F test results [self-drawn]

R ²	Adjusted R ²	F-Statistic	Prob(F-statistic)
0.96	0.95	114.24	0.00

In this paper, we use the EViews software to take natural logarithms of Y, X1, X2, X3, X4, X5, and use the OLS method to estimate the parameters of the model. Table 6 displays the obtained regression findings.

Only X2 and X3's t values are more than 2.16. According to the new model's regression results, only two variables' t-test results are significant. The model is then put through a VIF test, and the test results reveal that the VIF of LOG(X1), LOG(X2) and LOG(X5) are still larger than ten, and the model still has significant multicollinearity. In this paper, stepwise regression is used to eliminate the model's multicollinearity. Table 7 displays the results of the stepwise regression.

F = 114.24, which is greater than $F_{\alpha}(5, 13) = 3.03$, so we should reject the null hypothesis. P = 0.00, which is smaller than 0.05. As a result, there is a significant linear relationship between the variables (Table 8).

$t_{\alpha/2}(n - k) = 2.16$, the t-test is significant since all of the absolute t values are more than 2.16. F value, R² value, and t values are all in reasonable ranges, showing that the model fits well. Therefore, the multiple linear regression model equation is:

$$\text{LOG}(Y) = -3.03 + 5.75\text{LOG}(X1) - 4.15\text{LOG}(X2) + 4.47\text{LOG}(X3) \quad (3)$$

where Y represents the premium income of commercial health insurance in China, X_1 represents the per capita disposable income of urban residents, X_2 represents the proportion of government medical and health expenditure in fiscal expenditure, and X_3 represents the insurance depth.

6 Conclusions and Suggestions

6.1 Conclusions

From the above analysis, the premium income of commercial health insurance is positively correlated with per capita disposable income of urban residents and insurance depth, and negatively correlated with the proportion of government medical and health expenditure in fiscal expenditure. That is, holding all other variables constant, a 1% increase in the per capita disposable income of urban residents would lead to an average 5.75% increase in the premium income of commercial health insurance. A 1% increase in the proportion of government medical and health expenditure in fiscal expenditure would lead to an average 4.15% decrease in the premium income of commercial health insurance. A 1% increase in the insurance depth would lead to an average 4.47% increase in the premium income of commercial health insurance.

6.2 Suggestions

First, it is the government's responsibility to speed up economic development and boost people's disposable income level. On the one hand, the development of the insurance business is predicated on the smooth operation of the economy. Only by maintaining macroeconomic stability will China's insurance industry continue to grow. On the other hand, the rapid development of the economy is the premise and foundation of increasing residents' disposable income. Therefore, the government should vigorously develop the economy and improve the disposable income of residents.

Second, the government should deepen the reform of the medical security system and give full play to the role of commercial health insurance in the medical security system, and improve the multi-level medical security system. The combination of social medical insurance and commercial insurance, and public-private cooperation is the trend of health insurance development in the world. Therefore, the government should speed up the construction of the multi-level medical security system, further promote the medical security system, and issue relevant policies and measures to provide clear guidance for the growth of commercial health insurance.

Third, the government should exert its guiding role to strengthen the publicity and guidance of the correct understanding of the role of commercial health insurance. Chinese people's awareness of insurance is relatively weak. The lack of public insurance awareness is one of the main reasons for the slow development of commercial health insurance. Therefore, the government should strengthen publicity, popularize insurance-related knowledge to the public, and help people to purchase insurance rationally in order to advance the growth of commercial health insurance.

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