Research on Internet Use and Family Commercial Health Insurance Purchase Behavior: Evidence from China

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ABSTRACT
(1) Background: With the in-depth development of the Healthy China strategy and the awakening of residents' awareness of health care, commercial health insurance will surely play an important role in the medical reform in the future; (2) Methods: Based on the 2015 and 2017 panel data of the China Household Finance Survey (CHFS), a fixed effects model is used. Analysed the effect of using the Internet on family commercial health insurance purchase behaviour. And other factors that have an impact on the purchase of household commercial health insurance; (3) Results: The results show that family use of the Internet has a significant role in promoting the purchase of commercial health insurance. At the same time, these results were robust. The heterogeneity analysis results show that the use of the Internet has a significant impact on the consumption of commercial health insurance in rural and urban areas; (4) Conclusions: The use of the Internet has a positive effect on the consumption of home commercial health insurance.

Keywords: *Internet use; commercial health insurance; family; fixed effect*

1. INTRODUCTION

With the in-depth development of the Healthy China strategy, residents' demand for health care services also has been overgrown. Basic medical insurance can no longer meet the growing diversified medical and healthcare needs [9]. As an essential part of establishing a multi-level medical insurance system [17], commercial health insurance is of great significance for improving the living security level of residents and maintaining the stable operation of an aging society [13]. However, the country's commercial health insurance development is still in a bottleneck period. The reasons for restricting its development include ambiguity in the positioning of insurance products, insufficient policy support, high requirements on the health of the insured population, and low residents' willingness to apply for insurance [12]. With the advent of the digital economy era, the development of commercial health insurance will face new opportunities. So, what impact will the use of the Internet have on household commercial health insurance consumption [1] ? Although domestic and foreign studies on the impact of commercial health insurance consumption are relatively abundant, few studies on using the Internet on household purchases of commercial health insurance. Therefore, this article's study of this problem can make up for the lack of this literature. This is of great significance for the subsequent provision of good Internet insurance services and the construction of a multi-level social security system [15].

2. LITERATURE REVIEW

In the era of rapid development of the digital economy, the Internet and big data have changed people's consumption patterns. The technological revolution based on the Internet has significantly impacted efficiency and fairness. Studies have found that the development of the digital economy can bring entrepreneurial opportunities, significantly increase household income, and at the same time, have an impact on all aspects of household life [11]. Current research on the impact of the Internet on the lives of residents includes, but is not limited to, the impact on the physical exercise of the elderly, household consumption [5], and the increase in income of the digital economy [18]. Studies have shown that family use of the Internet can have a significant impact on commercial insurance purchase decisions by increasing online interactions [8],

that is, to promote insurance consumption by obtaining the subjective effect of insurance consumption during the interaction [20]. The research on the mechanism of the influence of Internet use on commercial insurance shows that the popularity of the Internet can reduce the cost of information search for consumers, reduce the degree of information asymmetry between the parties to the transaction, and reduce the cost of participation. Yang Biyun and others used the panel data of the China Family Tracking Survey 2014 and 2016 to investigate the relationship between household Internet use and commercial insurance purchase behaviour. The results showed that using the Internet can significantly increase household commercial insurance participation. In addition, the double-faced nature of the Internet brings about information authenticity and personal information security issues while rapidly transmitting information on the Internet, which will impact commercial insurance consumption [16].

3. EMPIRICAL APPROACH

3.1 Data source

The data used in the empirical research part of this article is the China Household Finance Survey (CHFS) data. The large sample size covers a wide range, and random sampling ensures the representativeness of the sample and the authority of the survey [10]. At the same time, the questionnaire included the essential demographic characteristics, assets, and liabilities of the household members of the interviewed households, insurance and security, expenditure and income, and financial knowledge [7]. This research uses its latest 2015 and 2017 data for empirical research. For the mutual benefit and protection of Authors and Publishers, authors must provide formal written Consent to Publish and Transfer of Copyright before publication of the Book. The signed Consent ensures that the publisher has the Author's authorization to publish the Contribution.

3.2 Variable selection and description

The primary research is whether Internet usage will affect household commercial health insurance purchase behaviour. The core explanatory variables in this paper are the Internet as the core explanatory variable and ownership of household commercial health insurance as the explanatory variable. The variables selected for this paper are explained next.

Table 1. Descriptive statistics.

Variable	Variable description	2015		2017	
		Mean	Sd.	Mean	Sd.
Commercial health insurance	YES=1, NO=0	0.037	0.189	0.069	0.254
Home internet use	YES=1, NO=0	0.463	0.499	0. 611	0.488
Total household income	Take the logarithm of the total household income	9.825	2.697	10.403	2.031
Gender	Male=1, Female=0	0.852	0.355	0.852	0.355
Marriage	Categorical variables;1to7represents different marital status	2.310	1.562	2.373	1.176
Education	Categorical variable: 1to9 means increasing degree	3.288	1.562	3.303	1.560
Work	YES=1, NO=0	0.688	0.463	0.651	0.477
Health status	Degree variable: 1to5 means from good to bad	2.660	0.947	2.655	1.015
Hospitalization	YES=1, NO=0	0.134	0.341	0.151	0.358
Medical loan	YES=1, NO=0	0.054	0.255	0.057	0.232
Social insurance	Categorical variables: 1to6 means different types of insurance	2.702	1.338	2.569	1.222
Commercial Life Insurance	YES=1, NO=0	0.070	0.254	0.067	0.250

Trust commercial insurance	Degree variable: 1-5 means increasing degree of trust	2.847	1.296	3.898	0.730
Urban and rural	Rural = 1, Urban = 0	0.387	0.487	0.385	0.487
Area	East = 1, Central = 2, West = 3	1.800	0.818	1.758	0.806

3.3 Measurement model

This article intends to use two-period panel data for empirical analysis. Since the explained variable in the study is a two-valued dummy variable, the logit model is selected for estimation. After conducting Hausmann's test, it is believed that the fixed effects model is more suitable for this study. Construct the core equation as follows:

$$Insurance_{it} = \beta_0 + \beta_1 Internet_{it} + \beta_2 X_{it} + \varepsilon_i + \mu_{it} \tag{1}$$

Among them, $Insurance_{it}$ represents a dummy variable of individual i possession of commercial health insurance in period t, $Internet_{it}$ represents the use of the Internet by observed value i in period t. X_{it} is a control variable including gender, age, marital status, education level, and total family income. ε_i and μ_{it} represent individual fixed effects and random disturbance terms, respectively.

The main research content of this article is whether Internet usage will affect household commercial health insurance purchase behaviour. This article uses the Internet as the core explanatory variable, and the family's commercial health insurance ownership as the explanatory variable. The following will explain the variables selected in this article.

4. RESULTS

4.1 Basic Regression

Table 2 is an empirical analysis result of the use of the Internet on the purchase behaviour of household commercial health insurance. Models (1) to (4) are regression results that gradually use individual fixed effects to gradually add the control variables. The empirical results in Table 2 show that family use of the Internet has significantly increased the possibility of consuming commercial health insurance. After gradually adding control variables at different levels, the coefficient of household Internet use has always been positively significant at the 1% level. This verifies the hypothesis proposed above to a certain extent. Model (2) adds individual-level control variables for analysis based on (1). The results show that the education level of the head of household has a positive effect on whether the family purchases commercial health insurance, and the health status of the head of household is negatively correlated with the purchase of commercial health insurance. This indicates that the higher the educational background of

the household head, the more likely it is to purchase commercial health insurance. At the same time, there may also be a phenomenon of people with poor physical conditions buying insurance. This reflects the possible moral hazard issues in the health insurance market. Model (3) and Model (4) are the results of adding the control variables of the head of household and the socio-economic level of the family and the regression of subjective attitudes towards commercial insurance. The results showed that in addition to the significant positive effects of Internet use on household commercial health insurance consumption, it was also found that the household head's ownership of social medical insurance and household income, and the household head's employment were all positively significant. It means that the head of the household has a significant positive impact on commercial health insurance when he has a job and has social and medical insurance. At the same time, economic income will also affect the purchase of commercial health insurance. The regression result (4) also shows that households' trust and satisfaction with insurance also significantly promote commercial health insurance consumption. This means that it can be possible to purchase commercial health insurance only by fully trusting commercial insurance. The information dissemination function of the Internet can promote residents' understanding of commercial health insurance.

Table 2. The influence of Internet use on household commercial health insurance purchase behaviour.

Variable	(1)	(2)	(3)	(4)
Home internet use	0.935***	0.910***	0.907***	0.790***
	(0.148)	(0.149)	(0.151)	(0.155)
Education		0.123**	0.110**	0.120**
		(0.053)	(0.056)	(0.057)
Marriage		0.0598	0.0830	0.0645
		(0.058)	(0.059)	(0.061)
Health status		-0.124*	-0.112**	-0.106*
		(0.053)	(0.055)	(0.056)
Hospitalization			0.00970	-0.0227
			(0.142)	(0.145)
Medical loan			-0.0706	-0.0406
			(0.295)	(0.306)
Work			0.309**	0.322**

			(0.125)	(0.127)
Total household income			0.0834***	0.0803***
			(0.0204)	(0.0207)
Social insurance			0.140***	0.149***
			(0.0315)	(0.0320)
Commercial Life Insurance			0.0484	0.00242
Social insurance			(0.0929)	(0.0949)
Trust commercial insurance				0.293***
				(0.0393)
FE	YES	YES	YES	YES

4.2 Robustness Check

In order to verify whether the use of the Internet is robust to the research results of household commercial health insurance purchase behaviour. This article will use the method of replacing explanatory variables to carry out the robustness test. The process of using the Internet at home will incur certain network communication costs. The time spent on the Internet and the amount of traffic are positively related to communication costs, so it can also be used as a substitute. Therefore, the logarithm of the home network communication cost is selected as a substitute variable for whether to use the Internet. Use individual fixed-effects models for analysis. The results of the robustness test are shown in Table 3. After adding network communication costs, individual-level control variables of household heads, family-level control variables and subjective attitudes to commercial insurance, network communication costs still have a positive effect on household commercial health insurance purchase behaviour. And it is significant at the 1% level, which is basically consistent with the benchmark regression results, and the results are relatively robust.

Table 3. Analysis of the effect of network communication fees on purchases of commercial health insurance.

Variable	(5)	(6)	(7)	(8)
Network communication costs	0.190***	0.185***	0.168***	0.149***
	(0.040)	(0.040)	(0.041)	(0.041)

Individual control variables		YES	YES	YES
Family control variables			YES	YES
Subjective attitude control variables				YES
Observations	2,866	2,866	2,866	2,866

4.3 Heterogeneity

The rural population accounts for a large proportion of the total population in China, and there is a gap between the economic level and the urban development [6]. Moreover, there are significant differences in the level of development of the Internet in different regions and between urban and rural areas. There are specific differences in commercial health insurance penetration rates in the eastern, central, and western regions and between urban and rural areas. Therefore, regression analysis was carried out to explore the differences between Internet use and household purchase of commercial health insurance in different regions and between urban and rural areas.

Regression analysis was performed on rural and urban areas, and the results are shown in Table 4. Household Internet usage has a significant impact on the purchase of commercial health insurance in urban and rural areas at 1%. The impact on rural areas is more significant than that on cities. For rural families, the popularity of the Internet in rural areas has broadened the channels for villagers to receive information [3], changing their views on commercial insurance and helping rural residents understand health insurance. Whether it is urban or rural, social security, total household income, and trust in commercial insurance have a significant positive impact on household commercial health insurance consumption at the level of 1%. This shows that purchasing commercial health insurance requires a certain level of income as a basis. For urban families, the higher the education level of the head of the household, the more likely to consume health insurance.

Table 4. Regression results of urban and rural areas.

Variable	(9)	(10)
	Rural	Urban
Home internet use	0.938***	0.685***
	(0.280)	(0.192)
Education	0.0518	0.125**
	(0.171)	(0.0603)
Work	0.564	0.321**
	(0.346)	(0.139)

Social insurance	0.369***	0.131***
	(0.126)	(0.0331)
Total household income	0.128***	0.0619***
	(0.0458)	(0.0238)
Trust commercial insurance	0.432***	0.261***
	(0.0917)	(0.0446)
Other control variables	YES	YES
Observations	536	2,294

5. DISCUSSION

Commercial health insurance is an important part of the multi-level social security system [14]. It has the function of filling the insufficient level of basic medical insurance protection and will play an important role in future medical reform. This article empirically examines the impact of using the Internet on household commercial health insurance purchase behaviours based on the 2015 and 2017 data of the China Household Finance Survey (CHFS). The main findings are as follows. First, with the increasing popularity of the Internet, family use of the Internet has indeed played a role in promoting commercial health insurance purchases. The result is still valid after using the network communication cost as a substitute variable for the robustness test. After using the network communication cost as a substitute variable for the robustness test, the result is still valid. Second, the education level, health status, and work conditions of the head of the household will also affect the purchase of commercial health insurance for the family, which shows that only with a certain knowledge reserve and a specific income condition can it be more likely to purchase commercial health insurance. At the same time, social medical insurance and commercial health insurance trust and satisfaction have a significant positive impact on household commercial health insurance consumption. Basic social medical insurance does not have a crowding-out effect on commercial health insurance but has a certain promoting effect. This also proves that commercial health insurance can be used as a supplement to basic medical insurance to meet people's multi-level health protection needs [2]. Third, in the analysis of the heterogeneity of the research results, it is found that the influence of Internet use on commercial health insurance is more significant in rural regions.

6. CONCLUSIONS

With the continuous development of Internet technology, economic development will enter a new normal. Young and middle-aged Internet users have a strong sense of self-purchasing insurance. This group of people's identity and acceptance of the Internet will profoundly impact the health insurance market in the

future [19]. Based on the conclusions drawn from the above empirical analysis, corresponding policy recommendations are put forward. From the perspective of expanding the influence of the Internet, it is necessary to continue to improve the construction of Internet base stations in the country's central and western regions and rural areas. The Internet provides low-income groups with employment and income channels to bridge the "digital divide."

From the perspective of commercial health insurance, as a supplement to basic medical insurance, the smooth development of commercial insurance business is inseparable from the investment of health resources and the balanced distribution of health resources [4]. Therefore, government departments need to increase input resources to promote fair distribution of resources. Commercial insurance companies need to pay attention to the development of Internet insurance, increase the promotion of commercial health insurance on Internet platforms, develop diversified insurance products for different Internet user groups, and maintain online consumer groups with high-quality after-sales service. At the same time, it will do an excellent job of connecting with medical institutions to ensure the smooth progress of follow-up claims services and form a virtuous circle from insurance to protection. Both the Internet business and the insurance business are inseparable from the adequate supervision of the regulatory authorities. Including ensuring the authenticity when conducting Internet advertising insurance business. Open up the feedback channels of Internet insurance platforms, prevent illegal businesses from falsely promoting insurance functions due to information asymmetry, and combat online insurance fraud. At the same time, it is also necessary to check the compensation link of insurance companies, which significantly affects the trust and satisfaction of residents in commercial insurance and maintains a good ecology of the health insurance market.

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