The Impact of Commercial Health Insurance Purchase on Household's Consumption: Evidence from China

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Abstract: China's Commercial Health Insurance Started in the 1980s, and Its Early Development Process Was Relatively Slow, and It Entered a New Stage of Development in the 21st Century. in Recent Years, the Scale of China's Commercial Health Insurance Has Continued to Expand, But Compared with Mature Markets, There is Still a Huge Gap and Room for Development. This Paper Uses the Two-Stage Least Squares Method of Adding Instrumental Variables through the China Family Financial Survey Database Chfs of Southwestern University of Finance and Economics, Empirically Analyzes the Impact of Commercial Health Insurance Purchase on China's Residents' Consumption, and Explores Commercial Health Insurance by Splitting Consumer Spending. the Impact on Different Types of Consumption and Consumption Structure Proves That the Purchase of Commercial Health Insurance Can Significantly Promote households' Consumption.

1. Introduction

China'S National Medical System Has Witnessed Great Achievements in Improving National Welfare and Alleviating Poverty. in March 2018, China's National Medical Security Bureau Announced That the Reform of Medical System Should Be Transferred from Curing Diseases to Focusing on People's Health Improvement, Which Indicates That Medical Insurance Will Become the Top Priority in the Future Reform. with the Continuous Improvement of the Medical Security System and the Gradual Construction and Completion of the National Medical Security Bureau, Medical Security Plays a Very Important Role in National Governance. Commercial Health Insurance Also Occupies a Very Important Position in the Medical Security System. the Gradual Improvement of the Medical Security System is Complementary to Commercial Health Insurance in a Certain Degree of Maturity. We Need to Gradually Establish a Comprehensive Medical Insurance System That Integrates Basic Medical Insurance and Commercial Medical Insurance, Further Release Residents' Household Risk Savings, and Promote Their Willingness to Consume. While Stimulating Domestic Demand, It Will Promote the Rapid Development of the National Economy, Ensure That Residents' Rights to Medical Care and Old-Age Care Will Not Be Violated, and Ensure Long-Term Social Stability.

Most Studies Hold a Positive Attitude Towards the View That Medical Insurance Can Promote Family Consumption. the Formation of This Attitude is Largely Influenced by Classical Economic Theories. They Think That the Marginal Utility of Smooth Income for Risk Avoidance is More Preferred by People. At This Time, the Demand for Certainty Gradually Replaces the Original Demand for Medical Insurance (Friedman and Savage, 1948). from the Point of View of Rational Expectation, People's Consumption Concept is Mainly Based on the Maximum Degree of Lifetime Utility Rather Than the Maximum Degree of Current Utility. When People Do Not Know about the Future Situation, the Consumption Power Will Decrease, Which Will Also Lead to the Actual Consumption Level of the Current Period Being Much Lower Than When People Have a Detailed Understanding of the Future Situation. Hubbard et al(1995) Pointed out That Social Security Can Improve Consumers' Certainty about the Future, So Preventive Reserves Will Also Decrease. for Patients with Diseases, Medical Insurance-Type Social Security Can Reduce Medical Expenses and Thus Increase Their Current Consumption. for Healthy People, Social Security Can Improve the Certainty of the Future, Thus Reducing Preventive Savings. Families Often Bear Economic Burdens Due to the Occurrence of Diseases. in General, in Order to Deal with the Uncertainty of Medical

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Expenditure and Reduce Economic Impact, Families Often Increase Preventive Savings (Atella,2005). Moreover, Assuming That Residents Lack Sound Social Security and Commercial Insurance, Most Families Will Reduce Investment and Consumption, and Then Increase Savings to Meet Future Demand for Capital (Gormleyetal,2010).

As for the Relationship between Medical Insurance and Consumption, Most of the Researches Conducted by Chinese Scholars Are Based on Basic Medical Insurance, Which is Mainly Related to the Opening Time and Compulsory Degree of Domestic Medical Insurance. after Joining the Medical Insurance for Urban Residents, Non-Agricultural Families' Spending on Non-Medical Services Increased by an Average of 13%, While the Impact on Lower-Income Families Was Relatively Large, with Their Annual Non-Medical Consumption Increasing by More Than 20%. the Impact on Middle Income is Also At the Middle Level, with Its Annual Non-Medical Consumption Increasing by More Than 12% on Average, While the Impact on Higher Income Families is Very Small (Zang Wenbin, Liu Guoen, Etc., 2012). Medical Insurance Can Further Improve the Family's Level of Risk Resistance, Thus Reducing People's Desire to Save Money to a Certain Extent, and Further Improving the Family's Current Consumption (Zhou Qin et al., 2013). Zhu Minglai and Kui Chao (2013) Explored and Analyzed the Relationship between the Medical Security System and Family Consumption Behavior with the Help of 31 Provincial Panel Macro Data Systems in China, and Integrated Commercial Health Insurance into Them. the Conclusion is That the Gradual Implementation of Commercial Health Insurance Can Also Drive the Increase of Residents' Non-Medical Insurance Consumption, and the Effect is Very Obvious. Wu Qingyue, Du Nianyu and Zang Wenbin (2016) Apply the Same Database, and Use the Method of Establishing Tool Variables to Deal with the Endogenous Problems of the Model, and Carry out Inquiry and Analysis on the Relationship between Commercial Health Insurance and Household Consumption. It is Concluded That the Continuous Improvement of Commercial Health Insurance Can Increase Residents' Expenditure on Non-Medical Consumption.

2. Theoretical Analysis

2.1 Income Effect of Commercial Health Insurance

Income is an Important Factor Affecting Household Consumption. as a Kind of Commercial Insurance, Commercial Health Insurance is Purchased Voluntarily by the Insured and Generally Requires Regular Payment of a Certain Amount of Premium. According to Friedman's Point of View, in the Case of Short-Term Fluctuations in Income, Consumers Will Generally Choose to Save or Borrow in Order to Smooth Their Consumption, While Rational Consumers Will Give Priority to Spending a Long-Term Income Rather Than Most of the Temporary Income. the Purchase of Commercial Health Insurance Has to Some Extent Reduced the Income of Residents and May Lead to a Drop in the Level of Consumption.

2.2 Psychological Effect of Commercial Health Insurance

On the Other Hand, Commercial Health Insurance Can Boost Residents' Consumption Confidence by Reducing Future Uncertainties. Commercial Health Insurance, as an Important Supplement to Social Medical Insurance, Can Well Resist Disease Risks and Alleviate Residents' Uncertainty, So Residents' Demand for Preventive Savings Will Be Correspondingly Reduced. as Its Consumer Confidence Index Rises, Its Consumer Will Also Increase. Specifically, for the Insured, Due to the Reduction of Uncertainty for the Future, the Demand for Pension and Medical Care in the Future Has Been Guaranteed to a Certain Extent, and Its Consumption Foundation Has Been Consolidated, Which May Reduce Current Savings and Increase Consumption.

To Sum Up, Whether Buying Commercial Health Insurance Will Promote or Inhibit Household Consumption Needs Further Empirical Analysis to Reach a Conclusion.

3. Data and Empirical Model

3.1 Data Source

The microdata involved in this paper are from the cross-section database of China Household Finance Survey (CHFS) in 2013 of China Household Finance Survey and Research Center of Southwest University of Finance and Economics. The data is stratified and sampled in three stages. Each stage is surveyed by a proportional sampling method based on PPS scale measurement. A total of 25 provinces and 2,585 cities/counties are within its scope, including 320 communities and 24,181 families.

The contents of the questionnaire mainly include: debt and credit restrictions, income, expenditure, population characteristics, payment methods and habits, employment status, etc. In the questionnaire, there are detailed records on the status of family purchasing commercial insurance, which can be used to analyze the impact of commercial health insurance on family consumption.

3.2 Empirical Model and Variables Selection

3.2.1 Empirical Model

The family consumption Y is taken as the explained variable, and the family consumption is classified, discussed and analyzed according to the necessary consumption (residents' clothing, food, housing, transportation and other necessary consumption) and unnecessary consumption. The following linear econometric model is established with whether the consumer purchases commercial health insurance chi as the main explained variable:

$$Y = c + \alpha \cdot chi + \beta \cdot K + \mu$$

Y is the set of explained variables, and vector k is the set of control variables that affect consumption. Lnac is the variable of total consumption, which is the logarithm of the sum of the expenditures of the surveyed households in one year. The variable lnpc is necessary consumption. The variable lnpc can be obtained by calculating the sum of the necessary expenditures of the interviewed families to maintain the normal life of the families, such as food, clothing, housing, transportation and so on, and taking the logarithm of the sum. Lnhc is a variable of unnecessary consumption. The variable is the logarithm of the sum of expenditures spent on entertainment, culture, education, tourism and other unnecessary consumption except for the necessary consumption, which can reflect the family's acceptance of high-level consumption and life attitude to a certain extent. Consumption structure variable cs is defined as the proportion of unnecessary consumption to total consumption. The higher this indicator, the more optimized the consumption structure of the family, which means that the family has higher pursuit and needs for spiritual consumption.

Chi is a dummy variable, which means whether to buy commercial health insurance. A value of 1 means one with commercial health insurance, and a value of 0 means one without commercial health insurance.

On the other hand, the explanatory variable chi whether it has commercial health insurance is itself a kind of consumption behaviour, and this variable may not satisfy the exogenous hypothesis, thus making the coefficient estimated by OLS ordinary least square method have deviation. Considering the possible endogeneity of the model, this paper will use the method of tool variables and 2SLS two-stage least square method to estimate on the basis of the model.

3.2.2 Selection of Control Variables and Tool Variables

In the model, vector K is the set of control variables that affect consumption. This paper refers to the control variables selected by Wu Qingyue and Du Nianyu (2013) when studying the impact of commercial health insurance on household consumption. Based on the screening of database data, three types of control variables are selected: demographic variables, economic-related control variables and social insurance and health-related variables. The specific meanings of each variable are shown in Table 1.

Table 1 Description of Controlled Variables

Types	Name	Description
Demographic	gender	1=male; 0=female
Variables		
	Residence(hukou)	1=others; 0=rural
	age	years
	education	1= "education <= primary school"; 2= "education = high
		school"; 3= "education >= college"
	marriage	1=married; 0=others
	work	1=yes; 0=no
Economic variables	income	Total income including wages, agricultural income, subsidies,
		net profits, retirement subsidies, etc.
Social insurance and	Social medical insurance	1=yes; 0=no
health status	(smi)	
	Social endowment	1=yes; 0=no
	insurance(soi)	
	Health status	1= fairly well; 2= well; 3= ordinary;4= bad, 5= pretty bad

As for the selection of instrument variables, this paper chooses "the commercial health insurance coverage rate of the province where the residents live" as the instrument variable. This is because this variable can show the development of the province's commercial health insurance market as a whole and can represent the insured behaviour of the province's residents to a certain extent. Generally speaking, the buying behaviour of ordinary residents' commercial health insurance is also affected to some extent by the social network. The higher the commercial health insurance coverage rate in the given province, the greater the probability that the residents will purchase commercial health insurance. At the same time, the consumption behaviour of individual residents is not directly affected by this variable and has a good externality.

3.2.3 Description of Statistical Characteristics of Each Variable

Through the screening and sorting of database data, the statistical characteristics of each variable are as follows:

Table 2 Statistical Description Of Variables

Name of Variable	Obs	Mean	SD	Min	Max
lnac	24181	10.4765	0.8452	6.4505	14.99
lnpc	24181	10.2260	0.8559	4.6052	14.86
lnhc	24181	8.3013	1.7993	-6.9078	14.41
cs	24181	0.7894	0.1485	-0.7750	1.00
chi	24181	0.0333	0.1794	0.0000	1.00
gender	24181	0.5067	0.5000	0.0000	1.00
hukou	24181	0.4737	0.4993	0.0000	1.00
edu	24181	1.6090	0.8037	1.0000	3.00
marriage	24181	0.9134	0.2812	0.0000	1.00
work	24181	0.7109	0.4534	0.0000	1.00
age	24181	48.0091	13.6877	17.0000	113.00
Inincome	24181	8.1773	3.1472	-4.6052	15.25
health	24181	3.2661	1.1929	1.0000	5.00
soi	24181	0.6548	0.4754	0.0000	1.00
smi	24181	0.8985	0.3020	0.0000	1.00
rate (Provincial rate of participating health insurance)	24181	0.0222	0.0120	0.0067	0.06

Table 3 Distinctions on Statistical Description of Variables of Groups with and without Health Insurance

Name of Variables	Group with commercial	Group without commercial health insurance
	health insurance	
ac	30209.96	12166.73
pc	13128.78	7859.311
hc	16288	5404.5
cs	0.8406	0.7876
gender	0.4882	0.5073
hukou	0.7143	0.4654
edu	2.1516	1.5904
marriage	0.8894	0.9142
work	0.7975	0.7079
age	42.29317	48.20598
income	53930.4	24557.34
health	2.8907	3.2791
soi	0.7081	0.6529
smi	0.8807	0.8991

Taking whether to buy commercial health insurance as the standard to divide samples for statistical description, it is obvious that there are great differences between the two groups in many aspects. First of all, for age, people who do not participate in commercial health insurance are six years older than those who do. This shows that young people are more likely to accept commercial health insurance. From the analysis of education status, it can be seen that the overall education level of participants in commercial health insurance is relatively high, which can explain that commercial health insurance is more likely to be concerned and trusted by people with high academic qualifications. According to the analysis of household variables, the proportion of non-agricultural registered permanent residence participants in commercial health insurance is relatively high. Judging from the working conditions, the working conditions of the people insured with commercial health insurance are more stable.

In terms of income, the income of the people who participate in commercial health insurance is about 2.2 times that of the people who do not participate in commercial health insurance. Although in general, families with certain economic strength are more capable of coping with the impact of medical health risks, through analysis of relevant data, it is found that families with higher incomes have a higher probability of purchasing commercial health insurance. It can also be explained that buying commercial insurance is an important way for high-income families to spread risks. Through the analysis of the consumption expenditure, it can be seen that the necessary consumption of the families participating in the commercial health insurance is 1.72 times higher than that of the families not participating in the commercial health insurance, while the expenditure on non-essential consumption products is about three times that of the uninsured families, thus making the total consumption of the uninsured families about half of the total consumption of the uninsured families. However, other personal characteristics, such as gender and marital variables, have little influence.

According to the different descriptions in the records between the groups, we can know that most of the people who take part in commercial health insurance have the characteristics of higher income, higher education level, relatively younger age and non-agricultural registered permanent residence. Next, we will further understand the relationship between variables through empirical analysis, and then analyze the relationship between commercial health insurance and household consumption behavior.

4. Empirical Results and Analysis

4.1 The Influence of Commercial Health Insurance on Total Household Consumption

Taking the logarithm of total consumption as the explanatory variable, this paper explores the influence of commercial health insurance on family consumption behaviour. Total household

consumption is the total household consumption expenditure, including necessary consumption and unnecessary consumption. This indicator is calculated based on the sum of expenditure items in CHFS survey data, excluding medical expenditure.

The model is estimated by OLS ordinary least square method and 2SLS two-stage least square method added with tool variables. The results are shown in the first column and the second column of Table 4 respectively.

Table 4 Impacts of Commercial Health Insurance on Aggregate Consumption

	(1)OLS	(2)2SLS
Name of Variables	lnac	lnac
chi	0.3263***	5.1766***
	(12.21)	(9.15)
gender	-0.0645***	-0.0263*
	(-6.67)	(-1.69)
hukou	0.2603**	0.2002***
	(21.49)	(9.97)
edu	0.2189***	0.1432***
	(29.05)	(7.85)
age	-0.0163**	-0.0102***
	(-10.22)	(-13.6)
marriage	0.3742***	0.3817***
	(21.90)	(14.53)
work	-0.0191*	-0.0758***
	(-1.67)	(-3.99)
Inincome	0.0461***	0.0379***
	(27.32)	(13.62)
health	-0.0935***	-0.0759***
	(-22.40)	(-11.23)
soi	-0.0254**	-0.0772***
	(-2.47)	(-4.55)
smi	-0.0671***	-0.0282
	(-4.15)	(-1.12)
_cons	9.6997	9.7247
	(309.59)	(197.82)
N	24181	24181

Note: Standard errors in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01

After adding tool variables to deal with the endogenous problem of the model, the coefficient size and significance level of each regression variable have changed, and the coefficient estimation will be more accurate and effective. According to the analysis of 2SLS results, the families participating in commercial health insurance have higher consumption in other aspects than the uninsured families, with obvious positive effects. Families taking part in commercial health insurance will increase their total consumption by an average of more than 5 times, while at the same time it is significant at the level of 1%.

Through the analysis of demographic characteristics, we can see that gender variables are relatively not obvious. Based on the analysis of family types, the household registration index is significant at the level of 1%, and the average household consumption of non-agricultural registered permanent residence households is higher than that of agricultural registered permanent residence by more than 20%, thus the differences in consumption concepts among different family backgrounds can be seen. The age index is significant at the level of 1%, which represents that young people are the main force of consumption. The effect of marriage on total consumption is significant at the level of 1%. Married people spend 38% more than unmarried people. This may be due to married people taking more responsibilities in the family and facing more consumption opportunities. With the continuous increase of household income, the average total household consumption will be increased by 3.7%, while the significance level is 1%. Compared with the families without social endowment insurance, the total consumption of the families with social endowment insurance will be reduced by 7.7%, and it is significant at the level of 1%.

In a word, the participation of commercial health insurance can promote the consumption expenditure of residents, both of which have strong positive effects, and other consumption behaviour factors are difficult to achieve the effect and degree of commercial insurance.

4.2 The Influence of Commercial Health Insurance on Residents' Unnecessary Consumption

The indicator of household unnecessary consumption expenditure is calculated by removing the expenditure necessary to maintain the living related to the residents' food, clothing, housing and transportation. The index includes expenditure on education and entertainment, fitness and leisure, luxury goods purchase, travel and shopping, etc., which can reflect the family's consumption concept and lifestyle.

The model is estimated by OLS ordinary least square method and 2SLS two-stage least square method added with tool variables. The results are shown in the first column and the second column of Table 5 respectively.

Table 5 Impacts of Commercial Health Insurance on Unnecessary Consumption

	(1)OLS	(2)2SLS
Name of Variables	lnhc	lnhc
chi	0.6215***	3.7847***
	(10.12)	(4.25)
gender	-0.1611***	-0.1383***
	(-7.26)	(-5.64)
hukou	0.1842***	0.1603***
	(6.62)	(5.07)
edu	0.4068***	0.3884***
	(23.52)	(13.53)
age	-0.0312***	-0.0195***
	(-12.62)	(-17.05)
marriage	0.3919***	0.3913***
	(9.99)	(9.46)
work	0.2585***	0.2299***
	(9.84)	(7.70)
Inincome	0.0661***	0.0615***
	(17.05)	(14.05)
health	-0.1165***	-0.1066***
	(-12.17)	(-10.03)
soi	-0.0649**	
-0.0332		
	(-1.41)	(-2.43)
smi	-0.1412***	-0.1152***
	(-3.81)	(-2.90)
cons	7.0678	7.0508
_	(98.26)	(91.10)
N	24181	24181

Note: Standard errors in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01

2SLS regression results show that commercial health insurance can promote unnecessary consumption of families. The total amount of unnecessary consumption of families insured by commercial health insurance increases by 378.5% on average, and is significant at the level of 1%. This means that when the demand for old-age care and medical care in the future is guaranteed to a certain extent, the consumption base of residents is consolidated, and families will increase the amount of unnecessary consumption by a large margin.

In terms of demographic characteristics, gender is significant at the level of 1%. Women will increase the amount of unnecessary consumption to some extent, which may be due to the fact that women's demand for luxury goods, beauty and entertainment and other unnecessary consumption is higher than that of men. From the perspective of family type, the relationship between household registration index and non-essential consumption is positive and significant at the level of 1%, which indicates that non-agricultural registered permanent residence families have higher pursuit

than agricultural registered permanent residence families. Married families have 39.1% more senior spending than unmarried families on average, and it is significant at the level of 1%, which may be due to married people taking more responsibilities in the family and facing more spending opportunities. Compared with people who do not have formal jobs, the average household unnecessary consumption of people with jobs is 23.0% more, which is significant at the level of 1%. According to the control variables related to economy, the increase of total income will increase the unnecessary consumption expenditure of households by 6.15%. This shows that work and future cash flow situation have a great impact on household consumption, stable and reliable work and future continuous cash flow will significantly promote household spending on unnecessary consumption.

4.3 The Influence of Commercial Health Insurance on Household Consumption Structure

Consumption structure is the proportion of unnecessary consumption to total consumption, and the greater the variable is. This shows that on the basis of satisfying the material needs necessary for survival, the family's spiritual life is richer, its consumption ability is stronger, and its consumption structure is more optimized.

Table 6 Impacts of Commercial Health Insurance on Consumption Structure

	(1)OLS	(2)2SLS
Name of Variables	cs	cs
chi	0.0332***	0.1605**
	(6.29)	(1.90)
gender	-0.0106***	-0.0109***
	(-5.57)	(-4.70)
hukou	-0.0018	0.0094***
	(-0.76)	(3.14)
edu	0.0213***	0.0278***
	(14.31)	(10.20)
age	-0.0018***	-0.0005***
	(-6.88)	(-4.92)
marriage	0.0105***	-0.0021
	(3.12)	(-0.53)
work	0.0264***	0.0355***
	(11.67)	(12.49)
Inincome	0.0029***	-0.0003
	(8.82)	(-0.66)
health	-0.0042***	-0.0002
	(-5.12)	(-0.23)
soi	-0.0019	0.0031
	(-0.92)	(1.21)
smi	-0.0082***	-0.0104***
	(-2.58)	(-2.75)
_cons	0.7303	0.1575***
	(118.14)	(21.41)
N	24181	24181

Note: Standard errors in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01

The 2SLS regression results show that commercial health insurance can optimize the consumption structure, and the insured commercial health insurance will improve the household consumption structure by 16.1%, which is significant at the level of 5%.

In terms of demographic characteristics, gender variables are also very significant, which may be related to the higher unnecessary consumption demand of women. The influence of age index on consumption structure is significant at the level of 1%, which shows the difference between young people's consumption habits and those of the elderly. Young people are the main force of consumption. The ability to optimize the household consumption structure of those who have jobs is 3.55% higher than that of those who have no jobs, and it is significant at the level of 1%, which shows that stable jobs can promote the optimization and upgrading of the household consumption

structure. In addition, the effects of marriage, self-rated health status, income and whether they have social endowment insurance indicators are not significant. To sum up, the insured commercial health insurance has a positive effect on the optimization and improvement of family consumption structure.

5. Research Conclusions and Policy Recommendations

We can see from the above that the promotion effect of purchasing commercial health insurance on total household consumption, unnecessary consumption and optimization of consumption structure is far higher than the effect of income, household registration, social endowment insurance, social medical insurance and other factors, which strongly shows that commercial health insurance has a great positive effect on improving the overall household consumption level, increasing unnecessary consumption and promoting the upgrading and optimization of consumption structure. That is to say, at the same level of investment, commercial health insurance plays a huge role in increasing domestic demand and releasing consumption potential. Under the background of China's consumption transformation and upgrading, combined with reasonable industrial policies, it can promote the optimal development of industrial structure and economic structure, and help the rapid development of China's economy.

Based on the results of this study, the following policy recommendations are put forward:

First, commercial health insurance can effectively promote total and unnecessary household consumption and optimize household consumption structure, but the current rate of commercial health insurance coverage in China is not high. Therefore, it is necessary to strengthen the publicity and popularization of commercial health insurance, so that more people can understand and accept commercial health insurance, so that commercial health insurance can cover a wider area and increase the insurance rate. This will further promote the optimization and upgrading of the consumption structure of Chinese families, stimulate domestic demand, release consumption potential, accelerate the upgrading of China's industrial economic structure, and enhance China's economic strength.

Secondly, in view of the remarkable difference in the impact of commercial health insurance on urban and rural household consumption, on the one hand, the consumer market in rural areas should be improved to promote the perfection of consumer services. On the other hand, we should strengthen the popularization of consumption knowledge in rural areas, improve consumption habits in rural areas, and guide rural families to establish healthier consumption habits. In order to alleviate the polarization of the urban and rural economy to a certain extent, and at the same time to maximize the positive effect of commercial health insurance on rural household consumption.

Third, establish a sound medical system framework, vigorously develop commercial health insurance, and provide residents with all-round and multi-level health protection. We will issue certain preferential policies for commercial health insurance, continue to increase efforts to support the development of commercial health insurance, and give full play to the huge role of commercial health insurance in optimizing the household consumption structure, stimulating domestic demand and reducing savings.

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