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Factors Influencing the Consumption Behavior of Commercial Personal Insurance in One-Child Families

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Abstract: Based on the Stimulus-Organism-Response (SOR) theory, this study empirically analyzes the influencing factors of commercial personal insurance consumption behavior in one-child families in China, utilizing the 2015 China Household Finance Survey (CHFS) data. The study findings reveal that expenses related to interpersonal interactions, household assets, and the health condition of the household head significantly promote the adoption of commercial personal insurance in families. However, families within the institutional system and households with female heads are less inclined to purchase commercial personal insurance. Heterogeneity analysis, on the other hand, revealed that single-daughter families and urban households have a greater demand for commercial personal insurance. In comparison to single-daughter families, expenses related to interpersonal interactions do not significantly promote insurance adoption in single-son families. Compared to urban households, financial education significantly stimulates insurance adoption in rural households. This study provides valuable insights on the consumption patterns of one-child families and contributes to the development and innovation of the commercial personal insurance market. It also offers empirical evidence for the formulation of differentiated policies tailored to different family types.

1. Introduction

With the socio-economic development, the number of one-child families in China has steadily increased. This has led to improved household economic strength and consumption capacity. However, China faces challenges due to population aging, low birth rates, and a high dependency ratio. As a result, Chinese families require risk protection and face significant risks. Population aging and low birth rates also pose challenges to society, the economy, and the government, particularly regarding elderly care responsibilities and insurance needs in one-child families.

China is experiencing rapid and extensive population aging. In 2021, the population aged 65 and above reached 14.2%, marking the onset of profound aging. By 2022, this proportion rose to 14.9%. Projections suggest that around 2030, China will enter a super-aged society with the elderly population exceeding 20%[1]. Notable regional aging trends are observed in the Northeast and the Sichuan-Chongqing area. China faces the convergence of three major demographic trends: aging, declining birth rates, and a rising number of individuals choosing not to marry[2]. The One-Child

Policy has had far-reaching effects on China's social and demographic structure, with increased pressure on pension and social security systems due to the responsibility of one-child families in elderly care. It is crucial to ensure the sustainability of pensions and the well-being of the elderly.

Population aging and low birth rates pose challenges for many countries and regions, affecting society, the economy, and government policies. Aging leads to a decrease in the labor force population and increased expenditures on social welfare. This challenges fiscal stability and sustainable development. Imbalances in the labor market supply and demand result in labor shortages and difficulties in adjusting industrial structures. Aging increases the burden on social security systems, including pensions and healthcare. The growing elderly population requires more retirement services and long-term care, placing higher demands on social security institutions and healthcare resources. Additionally, low birth rates impact family structure. One-child families face increased demand for elderly care, while individuals and families bear more retirement responsibilities due to the decrease in children. The rising elderly population strains family relationships and support networks. Moreover, low birth rates reduce the working-age population, posing challenges to the labor market and business development. Companies may experience talent shortages and decreased competitiveness, while the labor market faces imbalances in supply and demand, as well as wage pressure. The demand for medical services, long-term care, and community-based elderly services increases, necessitating more resources and support. These pressures contribute to social anxiety among the younger generation from one-child families, leading more individuals to seek commercial personal insurance to meet their needs.

However, the demand for commercial personal insurance in Chinese households is relatively low, and there is limited literature specifically addressing commercial personal insurance in one-child families. This study aims to explore the factors influencing the purchase of commercial personal insurance and their importance in one-child families. It focuses on analyzing the influencing factors and their marginal effects on insurance consumption in one-child families. The study adopts the Stimulus-Organism-Response (SOR) theory as a framework to investigate insurance consumption behavior in this context.

2. Theoretical framework

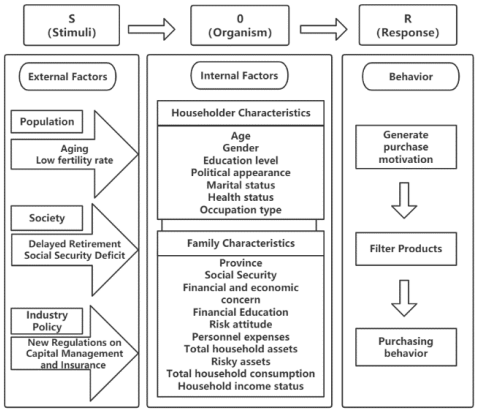

Figure 1: Research framework

In order to investigate which factors influence the purchase behavior of commercial life insurance for one-child families, the SOR theoretical model is used for the initial selection of influencing factors. According to the S-O-R model proposed by environmental psychologists Mehrabian and Russell[3], stimulus (S) is an environmental factor external to the organism, while organism (O) is a psychological transformation mechanism for users to internalize the stimulus into information, and response (R) represents the user's behavior in response to the information content of the external

stimulus. Relevant reaction behavior to the information content of the external stimulus.

Based on the above overview, the current overall social environment in the above research context is used as the external stimulus part of the SOR theory, which is divided into three main parts: demographic form, social environment, and industry policy. After being stimulated by the external environment, the internal circumstances of each single-child family are also many influencing factors for their commercial insurance purchasing behavior. The characteristics of the whole household include: the province where the household is located and local social security, the household's financial and economic concern, the degree of risk preference in investment and financing, the household's daily income and expenditure and assets. As shown in Figure 1, we will take only-child family as the research object to investigate which internal factors will further stimulate the motivation and purchase behavior of commercial life insurance under the stimulation of external social environment.

3. Study design

3.1 Sample and Data

The data of China Household Financial Survey Study (CHFS) of Southwest University of Finance and Economics, which covers 29 provinces (autonomous regions and municipalities directly under the central government) and has national and provincial representativeness, mainly includes household dataset and individual dataset, which provides a good database for the study of commercial life insurance consumption behavior of one-child families in this paper. Moreover, the 2015 China Household Financial Survey database contains exactly the core variables needed for our study: one-child households and commercial life insurance consumption. Finally, after shrinking the tail of the continuous random variables, there are 3551 one-child households in 29 provinces and 334 counties in 165 cities (states) in East, Central and West China, which satisfy the random sampling requirement.

The explanatory variable in this study is whether the one-child household is an insured household, i.e., whether the household has commercial life insurance, and according to the CHFS questionnaire, the variable "insured household" is 1 if at least one person in the household has commercial life insurance and 0 otherwise. The variables that may affect the household demand for commercial life insurance are divided into household head characteristics (demographic characteristics, health characteristics, occupational characteristics, social security characteristics, and financial and economic characteristics), household characteristics (risk attitudes, social interactions, household assets, and household business), and controlled for provincial fixed effects.

Descriptive statistical analysis based on valid samples, 12.4% of the 3551 one-child families surveyed were currently insured with commercial life insurance, which is consistent with Fan Gangzhi[4] and Wang Hongyang[1] The findings are similar to those of Fan Gangzhi and Wang Hongyang. In terms of individual characteristics, the age of household heads ranged from 20 to 70 years old, with 68.7% of male heads, and the average number of years of education of household heads was 10.2 years, which is related to the sample selection of this paper, and most of the household heads in 2015 enjoyed the national "nine-year compulsory education" policy. In terms of household characteristics, nearly 80% of the households have the need for human interaction, and 24.6% of the households have self-management.

3.2 Model Setting

The two dependent variables in the logit binary regression model are 0 and 1. The consumption decision of commercial life insurance of the one-child family is set as the dependent variable, that is. When P = 1, the one-child family buys commercial life insurance, and the family is an insured family;

when P = 0, no one in the one-child family buys commercial life insurance, and the probability that the one-child family buys commercial life insurance is:

$$Prob(Y_i) = P_i = \frac{e^{\beta_0+\beta_i X_i}}{1+e^{\beta_0+\beta_i X_i}} = \frac{1}{1+e^{-(\beta_0+\beta_i X_i)}}$$

The explanatory variable is the insured household, which is considered to be an insured household if at least one person in the household has commercial life insurance, and the possible influences on the demand for commercial life insurance have been placed in the table above.

$$e^{\beta_0+\beta_i X_i} = \frac{P_i}{1-P_i}$$

$$ln\frac{P_i}{1-P_i} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n$$

The final model is set as follows:

$$Logit(P) = ln\frac{P_i}{1-P_i} = \beta_0 + \Sigma_{i=1}^{n}\beta_i X_i + \gamma_i + prov_i + u_i$$

P denotes the commercial life insurance consumption decision of the one-child household; Xi represents all potential factors that may influence the household's purchase of commercial life insurance, mainly divided into household head characteristics and household characteristics; β_0 is a constant term; β_i is a parameter to be estimated and Provi is a provincial dummy variable; μ_i denotes a random error term.

4. Empirical analysis

4.1 Analysis of benchmark results

Table 1 reports the regression results of the baseline logit model, with column (1) controlling for individual characteristics only, column (2) controlling for individual and household characteristics, and column (3) controlling for individual characteristics, household characteristics, and provincial fixed effects. It can be found that the choice of influencing factors does not have too significant an effect on the estimation results, which also reflects the robustness of the estimation results side-by-side. In either case, there is no significant difference in the influencing factors of whether the one-child family is insured or not. Different from the general regression model, the regression coefficients of the Logit model can only represent the direction of influence between variables, not the marginal effect between variables, i.e., the magnitude of the regression coefficients cannot reflect the degree of influence of each explanatory variable on the explanatory variable, so the corresponding marginal effect values are reported in this paper for the Logit model. In order to measure the marginal effects of each influence factor, as Table 1 columns (4) (5) (6) correspond to the marginal utility values of regressions in Table 1 (1) (2) (3), respectively.

In terms of influencing factors, at the individual characteristics level, the effect of age shows an "inverted U-shaped" trend, with the probability of taking out commercial life insurance increasing and then decreasing as the household head gets older. The education level and financial and economic concern of the household head have a positive effect on the household's commercial life insurance coverage, while the male head of the household suppresses the household's probability of coverage. At the household characteristics level, household risk attitudes, human expenditures, and household assets significantly contribute to the probability of household commercial life insurance coverage, while the household head's institutional occupation significantly suppresses the probability of household commercial life insurance coverage. According to the marginal effects of the regression model, favorable expenditures, household assets, and the health status of the head of household

significantly contribute to household commercial life insurance enrollment behavior.

Table 1: Baseline Logit Model Regression Results

	(1)	*(2)dydx*	*(3)*	*(4)dydx*	*(5)*	*(6)dydx*
Variables	Business Personal Insurance coverage	Business Personal Insurance coverage	Business Personal Insurance coverage	Business Personal Insurance coverage	Business Personal Insurance coverage	Business Personal Insurance coverage
Age	0.141***	0.015***	0.180***	0.018***	0.180***	0.018***
	(0.045)	(0.005)	(0.047)	(0.005)	(0.048)	(0.005)
Age Squared	-0.002***	-0.000***	-0.002***	-0.000***	-0.002***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Gender	-0.271**	-0.028**	-0.222*	-0.022*	-0.223*	-0.022*
	(0.114)	(0.012)	(0.118)	(0.012)	(0.120)	(0.012)
Education Level	0.101***	0.010***	0.051**	0.005**	0.045**	0.004**
	(0.020)	(0.002)	(0.021)	(0.002)	(0.021)	(0.002)
Political Appearance	-0.110	-0.011	-0.134	-0.013	-0.081	-0.008
	(0.136)	(0.014)	(0.138)	(0.014)	(0.141)	(0.014)
Marital Status	0.280	0.029	-0.046	-0.005	-0.020	-0.002
	(0.183)	(0.019)	(0.191)	(0.019)	(0.194)	(0.019)
Health Status	0.209***	0.022***	0.118*	0.012*	0.117*	0.012*
	(0.068)	(0.007)	(0.070)	(0.007)	(0.071)	(0.007)
Chronic Diseases	0.270**	0.028**	0.213*	0.021*	0.194	0.019
	(0.124)	(0.013)	(0.127)	(0.013)	(0.129)	(0.013)
Hospitalization History	0.210	0.022	0.222	0.022	0.223	0.022
	(0.154)	(0.016)	(0.158)	(0.016)	(0.160)	(0.016)
Occupation Type	-0.511**	-0.053**	-0.537***	-0.053***	-0.549***	-0.055***
	(0.203)	(0.021)	(0.207)	(0.021)	(0.211)	(0.021)
Social Pension Insurance	0.252	0.026	0.090	0.009	0.095	0.009
	(0.170)	(0.018)	(0.175)	(0.017)	(0.177)	(0.018)
Social Health Insurance	0.069	0.007	-0.030	-0.003	-0.043	-0.004
	(0.118)	(0.012)	(0.126)	(0.013)	(0.130)	(0.013)
Financial and Economic Concerns	0.248***	0.026***	0.129**	0.013**	0.126**	0.012**
	(0.049)	(0.005)	(0.053)	(0.005)	(0.054)	(0.005)
Financial Education	0.374**	0.039**	0.244	0.024	0.261	0.026
	(0.170)	(0.018)	(0.174)	(0.017)	(0.178)	(0.018)
Risk Attitude			0.117**	0.012**	0.109**	0.011**
			(0.048)	(0.005)	(0.048)	(0.005)
Personnel Expenses			0.468***	0.046***	0.510***	0.051***
			(0.157)	(0.016)	(0.160)	(0.016)
Risky Assets			-0.226	-0.022	-0.209	-0.021
			(0.240)	(0.024)	(0.244)	(0.024)
Total Assets			0.302***	0.030***	0.311***	0.031***
			(0.049)	(0.005)	(0.055)	(0.005)
Total Consumption			0.318***	0.032***	0.331***	0.033***
			(0.085)	(0.008)	(0.087)	(0.009)
Whether Self-Managed			0.235	0.023	0.284*	0.028*
			(0.146)	(0.014)	(0.150)	(0.015)
Provincial Fixed Effects	NO	NO	NO	NO	NO	YES
Constant Term	-7.315***		-14.663***		-14.661***	
	(1.175)		(1.573)		(1.648)	
Sample Size	3552	3552	3551	3551	3486	3486

Note: ***, **, and * denote significance test coefficients passing 1%, 5%, and 10%, respectively, and the values in parentheses are robust standard errors

4.2 Heterogeneity analysis

For one-child families, different influencing factors such as demographic characteristics and family characteristics have significant differences on family commercial life insurance enrollment behavior. Further, it is necessary to explore: does the gender of children significantly affect the family commercial life insurance enrollment behavior in one-child families? What are the differences in the factors influencing the enrollment of one-child families and one-family families? In addition, do urban-rural differences also significantly affect family commercial life insurance enrollment behavior? What are the differences between rural and urban households? In this paper, we analyze the gender of children and urban-rural differences.

4.2.1 Differences between single-child and single-female families

Studies indicate that the structure of a family, particularly the number of children and their gender, significantly influences household consumption decisions [5-8]. In the context of this research, the consumption behavior of household commercial life insurance is analyzed. The proportion of households with one daughter having commercial life insurance coverage is 13.39%, while for one-child households, it is 11.39%.

One possible explanation for this disparity is that one-daughter families prioritize their own and their parents' health and retirement needs, while one-child families focus more on savings and investment. Additionally, one-child households may be more influenced by the traditional cultural belief of "raising children for old age," whereas one-daughter households tend to be more self-assured and independent.

The regression results in Table 2 (columns 1 and 2) demonstrate the impact of different factors on the enrollment of commercial life insurance in single-child and single-daughter households. For single-child households, total household assets, total household consumption, financial and economic concerns, risk attitude, and the education level of the household head positively affect the enrollment of commercial life insurance. However, institutional households and male-headed households show a negative effect on enrollment. In contrast, for one-daughter households, the most significant factors influencing commercial life insurance coverage are human expenses, followed by household assets, the financial education of the household head, and the health status of the head of household in terms of chronic illness.

4.2.2 Differences between rural households and urban households

The consumption level of both urban and rural residents in China is increasing, but there is a significant difference between urban and rural residents' household consumption.[9-10] However, there is a significant difference between urban and rural residents in terms of household consumption, and there is also a difference in commercial insurance purchasing behavior between urban and rural residents.[11] The consumption gap between urban and rural residents is obvious. In this study, 13.45% of urban households and 5.53% of rural households took out commercial life insurance. The reasons for this may be that urban households generally have higher income and education levels than rural households, and that urban households place more emphasis on personalized and multi-level medical coverage, while rural households rely more on government-led basic medical insurance.

Column (3) (4) of Table 2 also shows the regression results for the grouping of rural households and urban households. For urban households, household human expenses, household assets, and the health status, financial and economic concerns, and education of the head of the household positively affect the household's commercial life insurance coverage, while institutional households are less inclined to take out commercial life insurance. As for rural households, financial education will have

a significant positive impact on rural households.

Table 2: Heterogeneity analysis of single-child and single-female families

	(1) Only son dydx	*(2) Only daughter dydx*	*(3) Rural dydx*	*(4) Town dydx*
Variables	Business Personal Insurance coverage	Business Personal Insurance coverage	Business Personal Insurance coverage	Business Personal Insurance coverage
Age	0.017***	0.020***	-0.004	0.021***
	(0.006)	(0.008)	(0.014)	(0.005)
Age Squared	-0.000***	-0.000***	0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Gender	-0.029*	-0.010	-0.032	-0.020
	(0.016)	(0.018)	(0.058)	(0.013)
Education Level	0.005*	0.004	0.000	0.004*
	(0.003)	(0.003)	(0.007)	(0.002)
Political Appearance	-0.005	-0.010	0.020	-0.010
	(0.019)	(0.021)	(0.047)	(0.016)
Marital Status	0.014	-0.009	0.021	-0.007
	(0.027)	(0.028)	(0.031)	(0.021)
Health Status	-0.001	0.024**	-0.003	0.014*
	(0.009)	(0.011)	(0.021)	(0.008)
Chronic Diseases	0.004	0.036*	-0.019	0.019
	(0.017)	(0.019)	(0.041)	(0.014)
Hospitalization History	0.030	0.015	-0.094	0.028
	(0.020)	(0.025)	(0.070)	(0.018)
Occupation Type	-0.056**	-0.059*	0.044	-0.063***
	(0.027)	(0.032)	(0.096)	(0.023)
Social pension Insurance	0.031	-0.020	-0.000	0.011
	(0.024)	(0.027)	(0.041)	(0.020)
Social Health Insurance	-0.019	0.008	-0.111	-0.005
	(0.017)	(0.020)	(0.107)	(0.014)
Financial and Economic Concerns	0.018***	0.006	0.005	0.013**
	(0.007)	(0.008)	(0.018)	(0.006)
Financial Education	0.011	0.055**	0.189**	0.023
	(0.023)	(0.027)	(0.074)	(0.019)
Risk Attitude	0.015**	0.008	-0.008	0.012**
	(0.006)	(0.008)	(0.018)	(0.005)
Personnel Expenses	0.030	0.074***	0.024	0.060***
	(0.020)	(0.025)	(0.039)	(0.018)
Risky Assets	-0.027	-0.016	-0.157	-0.018
	(0.031)	(0.039)	(0.115)	(0.026)
Total Assets	0.037***	0.025***	0.009	0.032***
	(0.008)	(0.008)	(0.019)	(0.006)
Total Consumption	0.021*	0.038***	0.027	0.039***
	(0.012)	(0.013)	(0.026)	(0.010)
Whether Self-Managed	0.031	0.028	0.041	0.034*
	(0.019)	(0.025)	(0.051)	(0.018)
Provincial Fixed Effects	YES	YES	YES	YES
Sample Size	1833.000	1628.000	303.000	3014.000

5. Research conclusions and policy recommendations

This paper analyzes the influencing factors of household commercial life insurance coverage using the 2015 survey data of one-child households from the China Household Finance Survey, and the conclusions remain valid after a series of robustness tests. The specific findings are as follows: (1) Age has an “inverted U-shaped” effect on the probability of buying commercial life insurance, while education level and financial and economic concern have a positive effect. Male household head and institutional occupation have a negative effect. Risk attitude, human expenditure, and assets increase the probability of buying commercial life insurance.(2) There are significant differences in the factors

influencing commercial life insurance enrollment between only-son and only-daughter households and urban and rural households, with only-daughter households and urban households having a greater demand for commercial life insurance enrollment. Human expenditure does not significantly affect the enrollment behavior of one-child households, while financial education significantly affects the enrollment behavior of rural households. The purchase of commercial life insurance by one-child families is not only related to their individual and family well-being, but also to the social stability and development. There are many factors that influence their purchase behavior.

In order to promote the role of commercial life insurance in the social security system, provide risk protection and wealth management for one-child families, and reduce the social burden and pressure, we suggest: (1) Strengthen the social security and welfare for one-child families, reduce their human expenditure and family burden, enhance the social support and service, and improve their willingness and ability to buy commercial life insurance. (2) Strengthen the publicity and education of commercial life insurance, promote the innovation and diversification of commercial life insurance products, optimize the service and convenience of commercial life insurance, provide more insurance products and services that meet the needs of one-child families, and improve their awareness, knowledge, confidence and habit of commercial life insurance. (3) The authorities should develop differentiated policy measures for different types of one-child families. Provide more tax incentives and subsidies for urban one-child families and urban families, and more publicity, education and guidance services for rural one-child families and rural families. For single-parent one-child families and rural families, eliminate their misunderstandings and concerns about commercial life insurance by strengthening the publicity, education and guidance services of commercial life insurance, help them choose a suitable commercial life insurance plan, and improve their confidence and habit of buying commercial life insurance.

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