How Parental Health Affects Household Financial Risk Assets Selection

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Abstract. With the continuous improvement of economic level, the asset allocation of Chinese households are increasingly skewed towards financial products. At present, most researches about the household asset allocation mainly focus on the influence of residents' characteristics or financial literacy, while few researches on the internal relationship between household risk, asset structure and allocation choice. Under the background of population aging, it is of great significance to study the influence of parental health status on household risky financial assets. In this paper, Probit model and Tobit model were constructed to analyze the influence of parental health on family asset allocation, and the mediating effect was used to test the influential mechanism of parental health status on family asset allocation with intergenerational care. Finally, the heterogeneity of mediating effect between urban and rural families was analyzed. The research shows that the better parents' health status, the greater probability and depth of family's participation in the financial risk assets allocation. This impact can be generated through parental care for the offspring in family. However, compared with rural families, the path of influence in urban families is no longer significant.

Keywords: Household Financial Assets · Parental Health · Intergenerational Care

1 Introduction

With the rapid development of economy, household finance plays an increasingly prominent role in social life. It is of great significance to allocate household assets effectively, promote capital flow and maintain social harmony. Campbell believed that household participation in the financial market and allocation decisions on risky assets are affected by both wealth effect and family population structure [1]. Higher level of household risk assets allocation can enrich revenue sources in family, and then realize the maintenance and appreciation of household wealth. However, the limited participation in the household risky financial market has become increasingly obvious in China, which seriously hinders the rational allocation of household assets. According to the data of China Household Finance Survey (CHFS) in 2019, the financial market participation rate of households was only 10.1%, which further explained the low financial market participation rate of households in China.

As the most basic unit of social and economic life, the family with inherent economic function carries the development of individuals and economic society. How to effectively improve the multi-channel income of Chinese family and contribute to reasonable household assets allocation has become a hot issue concerned by society and lots of scholars. At the same time, the National Population Development Plan predicted that the proportion of elderly population in China will reach 25% and the total social dependency ratio will exceed 60% by 2030, which means that every 10 labor forces (15–65 years old) have to support nearly 7 non labor forces, including 4 elderly people. There is no doubt that the household financial decision-making and structure in China will be seriously affected.

The quality and quantity of population determine the quality of labor force, and its importance for economic development and social vigor can not be ignored. According to the 14th Five-Year Plan and the long-range objectives for 2035, the strategic policy orientation about actively responding to population aging has been upgraded to the national level. However, at present, senior care industries in China are still immature accompanied by a large number of disabilities. Besides, the basic construction of nursing home is incomplete, and the service system is also not perfect. There is a wide gap with the current requirements of elderly population. In the Research Report on the Health of the Elderly in China (2020–2021), it is pointed out that home-based care for the elderly will still be the main way of pension. In addition, the government has vigorously highlighted healthy aging in recent years, encouraging the formation of social atmosphere in which the elderly people have a sense of security and purpose. With the moral character of cherishing the young in Chinese nation, the elderly people usually provide intergenerational care for grandchildren so as to alleviate the financial and labor burden in family.

In recent years, studies have found that the existence and health of grandparents will produce a negative impact on risky assets allocation through the heavy burden of support, and further restrain the participation in finance. How will household allocate financial assets in the context of population aging? Is there any heterogeneity difference between urban and rural family about the impact of intergenerational care on household risky assets? These problems have become an important part of this paper to research the allocation of risky assets in China's household finance.

2   Literature Review

In general, scholars define the head of household as decision-maker whose characteristics, such as age [2, 3], intelligence level [4], marital status [5] and financial accomplishment [6] will have a huge impact on the assets allocation. Furthermore, investors also face non-tradable background risks, including health risks, social security degree, labor income risks and so on. Studies have shown that health risks has a negative impact on household venture asset investment due to making investors more cautious about risk [7, 8]. In particular, the aggravation of aging degree will lead to higher financial risk for elderly account of the increase in medical expenditure and the decrease in household income, which may further expand demand for medical services with the rising prices. As a result, elderly family will be confronted with more severe financial risks.

Nevertheless, the elderly especially in health, are important human resources and still have productive value [9]. It is worth mentioning that health is one of the important factors affecting economic decision-making, but it is rarely taken as the research object. Therefore, it is of immediate significance to review the impact of elderly on household financial asset allocation from a positive perspective.

On behalf of harmonious and happy family life, the health of elderly not only has a bearing on the financial situation and expectations, but also affects whether it is necessary to spend more human capital on the elderly. Rosen analyzed the data in American Health and Retirement Research Program and found that there was a significant inhibitory relationship between the health status of family members and the allocation of financial risk assets [10]. What's more, Yang elderly in poor health and enhancement of their legacy motivation will weaken the tendency about risk aversion, and then restrain household risk assets [11]. Boga indicated that family with children and elderly had markedly reduced educational savings and stock holdings, and the existing of elderly had double repression effect on the allocation of financial risk assets compared with the poor health [12]. However, the analysis process didn't take into account whether intergenerational care could relieve family pressure. Generally, the financial burden of family will become heavier owing to the increase of elderly and children, thus inhibiting the participation in financial market. Different from foreign countries, there is the intergenerational care of elderly for grandchildren in China. The elderly is able to look after their grandchildren more than existing as the burden of support. It is proved that intergenerational care was beneficial to cope with family's internal burden of support and economic pressure. As a consequence, distinct from the perspective of existing literature, this paper argues that the elderly is not simply curb the household financial risk assets allocation, but may also stimulate participation in the financial market through easing pressure on children.

A part of literature focuses on the relationship between intergenerational care and elderly physical and mental health, but no unanimous conclusion has been reached yet. According to aging tracking survey data in Korean, Chung and Park found that grandmothers who paused intergenerational care showed more depressive symptoms than those who still provided care [13]. When Chen and Sun used CHARLS data to study, they found that intergenerational care had a significant positive impact on the health of elderly, but the impact was different among diverse groups [14]. Tang and Pan further discovered that intergenerational care would reduce the burden of family rearing, thereby improving the probability and depth of participation in the risk market [15].

For that reason, the article breaks down effect about elderly health on the selection of household risky financial assets based on the data provided by CHFS in 2015, and tries to make contributions to the previous literature in following aspects. On the one hand, elderly health is introduced as the core explanatory variable to explore whether it will affect the allocation of household financial risk assets in China. On the other hand, the mediating effect test is applied to explore the path of elderly health affecting household financial asset selection, and is further examined whether there is heterogeneity between urban and rural family. Finally, put forward corresponding policy recommendations.

3   Research Design and Model

The empirical part takes the data in 2015, and the data in 2017 is utilized in robustness check due to different questionnaire settings, which covers 29 provinces, municipalities and autonomous regions in China with 40000 households. Hence, the data is very representative and the survey results are comprehensive, scientific and reliable.

3.1   Model Setting

3.1.1   Participation Probability of Financial Risk Assets

Whether to participate in financial risk investment is expressed as a 0–1 binary variable. When holding financial risk assets, the mark is 1, otherwise it is 0. As a result, Probit model should be used for regression analysis, and the corresponding model is as follows:

$$Fin = \alpha_0 + \alpha_1 Parenthealth + \beta X_i + \mu \tag{1}$$

The dependent variable Fin takes 0–1 to distinguish whether households participate in financial risk assets; Parenthealth is core quantity to explain the health level of elderly, and the control variable Xi includes a series of features about family, householder and regions.

3.1.2   Depth of Participation in Financial Risk Assets

In the case of participation depth about household financial risk assets, Tobit model is more suitable for further analysis of truncated data, and the corresponding model setting is as follows:

$$fin^* = \alpha_0 + \alpha_1 Parenthealth + \beta X_i + \mu \tag{2}$$

$$Fin = max(0, fin^*) \tag{3}$$

3.2   Variable Description

3.2.1   Dependent Variables

Financial assets contain financial risk assets (stocks, funds, bonds, wealth management, credit derivatives, foreign currency and precious metals), social security account balance, cash, deposits, other financial assets and loans. The explained variable is the participation and proportion of risk financial assets. If the family holds financial risk assets, Fin is defined as 1, otherwise as 0; The participation depth of financial risk assets is expressed as the proportion of financial risk assets in total household financial assets.

3.2.2   Independent Variables

The question named "Compared with peers, what is the current physical condition?" is noted as elderly health variable, which is assigned from 1 to 5 depending on actual health status.

3.2.3   Control Variables

The control variables in this paper are composed of family, householder and regional characteristics. Among them, family characteristics include total members' income and family assets. In order to eliminate heteroscedasticity and nonlinearity, the variables about household are logarithmized. The householder characteristics involve gender, age, marital status, education degree, risk attitude, intergenerational care and whether the family has purchased commercial insurance. The regional characteristics define the urban town as 1 and rural area as 0. According to the location of family in administrative division, this paper defines some families belonging to Beijing, Tianjin, Hebei and other regions as east, and others pertaining to Inner Mongolia, Guangxi and neighboring areas as western region. The rest such as Shanxi and Jilin are classified as the central region. Specific variable settings are shown in Table 1:

Table 1. Description of main variables

Definition	Symbol	Explanation
Participation in risk assets	Finance	If participate, the value is 1, otherwise it is 0.
Participation depth of risk assets	FinanceSize	Proportion of household financial assets in total property
Health status of elderly	Parenthealth	Values range from 1 to 5. The larger value, the worse health.
Gender	Gender	Male is 1, and female is 0.
Age	Age	Age of householder
Marital status	Marrige	Married is 1, unmarried is 0.
Degree of education	Edu	Years of schooling
Risk preference	Risk	Values range from 1 to 5. The more aversion, the greater value.
Intergenerational care	Care	If intergenerational care exists, the value is 1, otherwise it is 0.
Whether the family has purchased commercial insurance	Insurance	The value of owning commercial insurance is 1, otherwise it is 0.
Whether the family engages in industry and commerce	Business	The value of family engaged in industry and commerce is 1, otherwise it is 0.
Regions and provinces	Region	East is 0, midland is 1, and west is 2.
Areas	Rural	Town is 0, and countryside is 1.
Household total incomes	Income	—
Household total assets	Asset	—

3.3 Descriptive Statistics

It can be seen from Table 2 that participation rate of financial risk assets in Chinese households is only 17.4%, and the depth is as low as 3%. It can be inferred that the proportion of financial asset allocation is seriously unbalanced as well as the limited participation in financial market become more and more prominent. In term of the householder characteristics, the largest scale is male accounting for 75.7%. The average age of householder is 43.037 years old, most of whom are young and middle-aged. The average schooling of householder is 10.683 years, and the educational level is mostly at high school background. The average number of parents' health is 2.891, which is optimistic overall situation. In addition, The proportion of elderly intergenerational care is about 47.6%. From the perspective of family characteristics, the proportion of commercial insurance is only 12.6%, and the insurance function can not play an efficient role in family finance, which reflects the awareness of family risk management and anti-risk capacity are weak, further constricting family's tendency to participate in the financial market. In the meantime, family prefers risk aversion. In view of household financial status, the average annual income is about 111000 RMB, and the average total assets is about 1.25 million yuan. According to the distribution of family areas, 31.1% are located in rural areas, 68.9% are situated at urban towns, and most of them lie in the east.

Table 2. Descriptive statistics

Variables	Sample capacity	Mean value	Standard deviation	Minimum	Maximum
Finance	3,054	0.174	0.379	0	1
FinanceSize	3,054	0.03	0.143	0	1
Parenthealth	3,054	2.891	0.974	1	5
Gender	3,054	0.757	0.429	0	1
Age	3,054	43.037	11.445	17	89
Marriage	3,054	0.817	0.386	0	1
Edu	3,054	10.683	3.813	0	19
Risk	3,054	3.6855	1.2224	1	5
Care	3,054	0.4761	0.4995	0	1
Insurance	3,054	0.126	0.332	0	1
Business	3,054	0.224	0.417	0	1
Region	3,054	0.749	0.851	0	2
Rural	3,054	0.311	0.463	0	1
Asset	3,054	1253499.4	2425915.9	400	20000000
Income	3,054	111001.44	269964.19	1	5000000

4 Empirical Analysis

4.1 The Influence of Elderly Health on Family Risk Assets Allocation

Table 3 displays regression results of elderly health on family financial risk asset participation. No matter whether there are control variables, the coefficients of elderly health are remarkably negative at the 99% significance level, which implies that the elderly health status in family really affects the allocation of financial risk assets. Among them, (1) and (3) are the regression results of univariate Probit and Tobit models, and (2) and (4) are the regression results of multivariate Probit and Tobit models after adding control variables.

First of all, majority of the control variables' coefficients are outstanding at 99% significance level, consistent with the conclusions of available researches. According to (1) and (2), the marginal utility of elderly health is significantly negative, which indicates that health status of elderly in family really plays a positive role in promoting the allocation of household financial risk assets. As the health status of elderly becomes worse, the probability of financial risk investment will decrease by about 5.62%. Secondly, the results in (3) and (4) express the health status of elderly also has a negative inhibition relationship with the depth of participation in family risk assets. With the deterioration of elderly health, the depth will decline by 0.26%. Finally, in terms of control variables, gender related to householder characteristics has no significant impact on whether household participates in the market of financial risk assets. As for the age of householder, it is similar to the "inverted U-shaped" structure. Because the objective families of article are those who need to support both parents and children, the age of householder is generally concentrated in the young and middle-aged. As the age increases, the probability and depth of participating in financial investment also grow. It is apparent from the marriage variable that the marriage status coefficient is positive at the 10% significance level, which may be caused by the more stable family income sources of both spouses compared with single parent families, and thus more willing to invest in financial risk assets. The education level has a positive impact on the participation and depth of household financial risk asset allocation at the 99% significance level. With the improvement of householder education level, the probability of their participation and investment in financial risk assets also increases, possibly because the knowledge improves the financial literacy of householder, thus promoting the allocation of household risk assets. The intergenerational care has also significantly increased the participation and allocation of household financial risk assets, which explains that intergenerational care can alleviate the financial burden of family, thus encouraging family to prefer to participate in the financial market. The existence of commercial insurance can also help household to participate in financial risk market, which may be caused by the enhancement about risk resistance capacity. In the field of regional characteristics, households in the east are also more likely to invest in venture capital than those in the central and western areas. Perhaps because of more time and higher degree of economic development in the east, households can contact the financial market earlier to form a fantastic investment atmosphere. Moreover, with the increase of total household assets

and net household income, the probability of holding financial assets is greater, indicating that families with more wealth are more willing to invest their spare funds in the financial market.

Table 3. Effect of elderly health on household risk assets allocation

	Participation of financial risk assets		Participation depth	
	(1)	(2)	(3)	(4)
Parenthealth	−0.2437*** (0.0132)	−0.0562*** (0.0167)	−0.0089*** (0.0007)	−0.0026*** (0.0007)
Gender		−0.0546* (0.0285)		−0.0016 (0.0014)
Age		0.0046*** (0.0008)		0.0003*** 0.0000
Marriage		0.0921* (0.0356)		0.006** (0.0015)
Edu		0.035*** 0.0038		0.0017*** 0.0002
Risk		−0.2088*** (0.0121)		−0.0063*** (0.0006)
Care		0.2189*** (0.036)		0.0107*** (0.0022)
Insurance		0.4050*** (0.0384)		0.017*** (0.0021)
Business		−0.1650*** (0.0312)		−0.0112*** (0.0017)
Region		−0.1474**** (0.0179)		−0.0019*** (0.0008)
Rural		−0.7211*** (0.044)		−0.008*** (0.0016)
Asset		0.3649*** (0.0149)		0.008*** (0.0034)
Income		0.1335*** (0.0131)		0.0034*** (0.0005)
Constant	−0.4081*** (0.0381)	−6.7035*** (0.2225)	−0.0475*** (0.0022)	−0.1054*** (0.0022)
LR chi2(13)		955.89		955.26
Pseudo R^2	0.2441	0.3119	0.3274	0.1122
Sample capacity	3,054	3,054	3,054	3,054

4.2 Influential Mechanism

M is called an intermediary variable if X affects Y by influencing variable M. This paper will take intermediary effect analysis method proposed by Wen [16] as a reference, and use intergenerational care as an intermediary variable to explore the impact mechanism of elderly health on financial risk asset selection, and build the following model:

$$Fin = \alpha_0 + \alpha_1 Parenthealth + \alpha_i X + \mu \tag{4}$$

$$Care = \beta_0 + \beta_1 Parenthealth + \alpha_i X + \mu \tag{5}$$

$$Fin = \gamma_0 + \gamma_1 Parenthealth + \gamma_i Care + \alpha_i X + \mu \tag{6}$$

Fin refers to whether there are financial risk assets in family; Care is a mediating variable defined as whether elderly take care of their grandchildren; Coefficient of intermediate variable α、γ respectively represent the total effect and direct effect of elderly health on the household financial assets allocation.

According to the analysis and testing process for intermediary effects, the first step is to establish a regression model for explanatory variables and explained variables in order to test significance of core explanatory variables. Proceed to the next step if significant, and establish a regression model for intermediary variables and core explanatory variables as well as a regression model for explained variables and intermediary variables. Intermediary effects exist if significant, otherwise further testing by Sobel method is required. Table 4 shows the results of intermediary effect test about intergenerational care and family risk preference.

According to the intermediary effect path of intergenerational care, the health status of elderly can affect the existence of intergenerational care, and they appear negative relationship at the 99% significance level, which proves that the healthier elderly are, the more energy and financial resources to spend on their grandchildren. At the same time, the intergenerational care has a positive impact on the financial risk asset participation at the 99% significance level, which further illustrates the robustness of impact about elderly health on financial risk assets allocation.

Table 4. Regression results of intermediary effects along with parental health, intergenerational care and risk asset allocation

Variables	Risky assets	Intergenerational care	Risky assets
Parental health	−0.0032*** (0.0009)	−0.0088*** (0.0029)	−0.0026*** (0.0007)
Intergenerational care			0.0107*** (0.0022)
Control variables	Yes	Yes	Yes
Sobel test	Significant coefficient without Sobel test		
Intermediary effect	Significant		

Table 5. Heterogeneous results of intermediary effects about intergenerational care in different regions

Variable	Urban family			Rural family		
	Risky assets	Care	Risky assets	Risky assets	Care	Risky assets
Parental Health	−0.018*** (0.0006)	−0.0022 (0.0038)	−0.0004** (0.019)	−0.0688*** (0.0242)	−0.0077** (0.0004)	−0.0049** (0.0015)
Care			0.0018 (0.0006)			0.0093*** (0.0034)
Control variable	Yes	Yes	Yes	Yes	Yes	Yes
Sobel test	P = 0.9 > 0.05 means not significant			Significant coefficient without Sobel test		
Intermediary effect	Significant			Significant		

4.3 Heterogeneity Analysis of Mediation Effect

According to the existing researches, factors such as areas and regions often lead to heterogeneous differences between families. Therefore, in order to explore whether the influence of elderly health on intergenerational care and risk preference is heterogeneous in different regions, families are divided into urban and rural groups for in-depth research. The results are shown in Table 5.

The above results show that the intermediary effect of intergenerational care in urban families is no longer significant after the sample are divided into urban and rural groups. Probably because urban families have more extensive means for elderly pension and medical problems, while rural families are often have a few of limitations and unable to acquire better conditions. Moreover, rural elderly perhaps pay more attention to their grandchildren, in result that the intermediary effect is constantly significant.

5   Robust Test

5.1   Variables Substitution

As Chinese household risk assets investment mainly focuses on stocks, referring to the robustness test method of Ma [17], this paper replaces the dependent variable with whether households hold stocks and the proportion of stocks held in financial risk assets. It can be seen from Table 6 that both in a single variable regression and the result adding control variables, elderly health has a significantly negative impact on participation and depth in stock market. This means that the worse elderly health, the lower probability and investment in the stock market, which is consistent with the regression results of financial risk assets, thus verifying robustness of the empirical analysis above.

Table 6. The effect of elderly health on household stock participation and depth

	Stock participation		Participation depth	
	(1)	(2)	(3)	(4)
Parenthealth	−0.1887*** (0.5529)	−0.14*** (0.0321)	−0.1494*** (0.1223)	−0.122*** (0.1282)
Gender		−0.008 (0.0774)		0.0377 (0.2871)
Age		0.0042 (0.0036)		0.0013 (0.0133)
Marriage		0.1342 (0.092)		−0.3639 (0.303)
Edu		0.0995*** 0.013		0.011*** (0.0435)
Insurance		0.2961*** (0.0872)		0.2992*** (0.2751)
Business		−0.1490*** (0.0831)		−0.0076*** (0.2858)
Region		−0.2412*** (0.4536)		−0.1895*** (0.1524)
Rural		−0.8035*** (0.1532)		−0.0665*** (0.1524)
Asset		0.2814*** (0.0348)		0.0569*** (0.1230)
Income		0.0563*** (0.0319)		0.2813*** (0.1412)
Risk		−0.2526*** (0.0302)		−0.1045*** (0.1070)
Care		0.1506*** (0.0712)		0.1304*** (0.2517)
Constant	−0.5529*** (0.089)	−6.0242*** (0.522)	−2.3498*** (0.3317)	−6.1189*** (0.7989)

5.2 Information in 2017

Due to different question settings, the CHFS questionnaire in 2017 did not involve issues related to intergenerational care. For this reason, the intergenerational care were removed from the control variables, and the previous model was used for robustness test.

It can be seen from Table 7 that elderly health is still significant at the 99% level both in univariate and multivariate regression, and have a negative relationship with the allocation of household financial risk assets, that is, allocation of family financial risk assets will be inhibited with the deterioration of elderly health. The conclusion is the same as that of the data in 2015, which further indicates that the above results are robust.

Table 7. Data in 2017: the impact of elderly health on household financial risk asset participation

	Participation of financial risk assets		Participation depth	
	(1)	(2)	(3)	(4)
Parenthealth	−0.1936*** (0.0319)	−0.1749*** (0.0327)	−0.1731*** (0.0614)	−0.1326*** (0.449)
Constant	−0.7182*** (0.0937)	−6.0242*** (0.522)	−0.4668*** (0.1714)	1.0036*** (0.1782)
Control variables		Yes		Yes

6 Conclusions and Suggestions

This paper has drawn the following conclusions: First, elderly health has a positive impact on the choice of household financial risk assets. With the improvement of elderly health, the probability of participation in financial investment increases. Second, it has been proved that the healthy elderly can alleviate pressure within the family through intergenerational care, thus promoting the probability and proportion of financial risk assets. Third, the intermediary effect mechanism of elderly health on intergenerational care is heterogeneous in different areas. The health status of elderly in rural families has a more significant impact on intergenerational care behavior than that in urban families.

For a family, elderly have lots of impacts on financial situation. On the one hand, the head of family often needs to bear more support pressure with the growth of parents' age. Therefore, parents' health status has a more obvious impact on the household asset allocation. When parents' health becomes worse, in order to ensure medical requirements, decision makers in family economic activities tend to reduce the allocation of financial assets as the main measures. On the other hand, elderly often choose to look after their grandchildren when in good health, which provides more rest and work time for the main labor force in family, thus improving family income and risk tolerance and facilitating the probability of families participating in the financial market.

To sum up, this paper puts forward the following suggestions: First, the impact of elderly health on household financial risk assets is fundamentally determined by risk tolerance and expected maintenance expenditure. Therefore, we should comprehensively popularize commercial medical insurance, life insurance and other products, so as to improve the social security system and facilities. For example, the government can cooperate with insurance companies to provide more comprehensive, convenient and cheaper endowment insurance for serious diseases. Second, pension system, facilities and institutions in China are not perfect, and pension assignments still need to be completed by household. It is recommended that government subsidies are provided to families and private pension funds are also encouraged to expand pension channels, which can effectively promote the rational allocation of household financial assets and improve the liquidity of capital market. It can also solve the urgent pension problems and relieve family pressures, so as to build a happier family and a more efficient financial market.

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