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Health Status of Family Members on Family Investment

Huimin Shang

Beijing Technology and Business University, School of Economics, Haidian District, Beijing, 100089, China

Abstract: *This paper takes the data of 2017 China Family Finance survey data as a research sample, empirically analyzes the health status of family members on family investment behavior, and further analyzes the particularity of middle class families. The empirical results show that the worse the health of family members, the lower the participation in financial markets. Moreover, the heterogeneity analysis shows that the impact of health status on financial market participation is more influential on rural registered households. Further, this examination of middle class families found that health status affected their investment behavior.*

Keywords: *Health Condition; Household Investment; Middle-Class Family; Asset Allocation*

1. Introduction

With the continuous development of the world economy in recent years, the Chinese economic market asset structure is constantly make corresponding adjustments, however, from some ways, the Chinese family financial asset structure is still relatively single, the ordinary people of stocks, bonds, fund market participation is very limited, this with the United States, Japan and other developed countries form a big difference, is not conducive to promote the sustainable development of China's financial market. As of 2014, half of the household financial assets held by Chinese residents were still in bank deposits, according to the Chinese Academy of Social Sciences. In fact, only 7.66%, 0.54% and 0.89% of the financial assets of Chinese residents are directly invested in stocks, bonds and funds, respectively, indicating that ordinary people's willingness to invest in all kinds of financial assets other than deposits is still relatively low. In contrast, in 2014, Japanese residents (including private non-corporate enterprises) invested in 26.07% of their financial assets invested in stocks and fund shares in 2014. But as wealth accumulates, the asset allocation background of Chinese residents is changing. In 2016, the per disposable income of Chinese urban and rural residents reached 33,600 yuan and 12,400 yuan, respectively, and both still showed a steady rise. At the same time, the Engel-Coefficient of urban and rural households fell to 29.3% and 32.2%, respectively, which means that the proportion of Chinese household income used to maintain basic survival is declining, so that more income can be invested in the financial market and allocate various financial assets.

The report to the 19th National Congress of the Communist Party of China states that to continuously make new adjustments and progress in China's economic development, it needs to continuously increase residents' property income and promote steady and rapid economic and social development. To increase the property income of Chinese residents, from the national level, to develop the economy, we must build a healthy and stable market platform, so we must improve the capital market. However, at present, the family asset structure of China's residents is still biased to the traditional model, and the vast majority of residents are more conservative in asset allocation, and they are more inclined to choose bank deposits, or even leave their property idle at home. And for stocks, bonds and other risk asset allocation acceptance rate is low. In view of this phenomenon, many scholars began to analyze the reasons for this situation from the perspective of background risk, and from then on, the health status of family members is a very important part of the background risk. According to the existing literature and related survey results, family members of poor health families, such as a disease impact precursor or is experiencing disease, due to the impact of reality or future expectations, generally choose to increase the investment in security assets, reduce the risk of investment, in order to obtain the future family assets security expectations. However, this situation cannot be accurately demonstrated, because health status is often the subjective feeling of family members, and there is no objective and accurate measure, in which respect, and the degree of disease impact measured by

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medical expenditure more objectively reflects the medical burden of families. In reality, due to the existence of many medical insurance and social insurance, many families in our country will often choose various formal or informal insurance mechanisms to mitigate or offset the negative impact of the disease. Therefore, the expenditure required for disease impact does not necessarily have an impact on household assets, and that is, the negative impact of disease impact does not necessarily completely affect asset selection. Therefore, the impact of disease shocks is also highly uncertain. From this perspective, whether a family has the ability to deal with the influence of disease, depends on the family degree of "self insurance", in our country, due to cultural differences, regional differences and family members by the difference of education level, different families out of different ideas, environment, tend to choose a variety of different ways to deal with the influence of family members of the disease. Therefore, the impact of disease shocks on household asset allocation cannot be accurately determined.

To sum up, this paper hopes to answer the following questions through empirical analysis: (1) will the impact of disease impact affect household asset allocation?Can different families respond with disease shocks in different ways to better participate in financial or non-financial markets? (2) Will the disease impact lead to the limited participation of risky financial assets such as Chinese stocks?Is there any difference between the different income groups on this issue? This study helps to understand the breadth and depth of disease impact on asset allocation, provides new ideas for adjusting government policies and financial institutions, to promote family welfare, deepen the reform of capital market, and help the family according to the influence on the severity of illness, develop reasonable asset allocation strategy, increase property income, reduce medical burden, and promote the benign development of the family.

2. Literature Review

Family asset allocation is the most important perspective of family finance research. The classical asset allocation theory began in the 1950s. Markowitz (1952) [1]proposed the mean variance model, which took the lead in studying portfolio decisions through quantitative methods. This theory is regarded as the beginning of modern finance, and this theory assumes that investors' decisions are only based on the expected returns and risks of assets. On this basis, Tobin (1958)[2] introduced money as a special risk-free asset into Markowitz's model to proved the separation theorem of two funds. The mean variance model of Markowitz needs to calculate the expected return, variance and two two correlation coefficients of each asset. The calculation amount is very huge, so there are some difficulties in practical application. To this end, Sharpe (1963) [3]proposed a simplified model to associated the yield of a certain securities with the volatility of the whole market. Later, the CAPM model was developed on this basis, the core of which was to explain the rate of return investors should demand to compensate for a certain degree of risk.In terms of expanding the time dimension, Samuelson (1969)[4] uses a dynamic stochastic process to develop the single-phase asset-selection model into a discrete cross-phase model.

As for the impact of family members' health status on family investment, most of the existing literature discusses the allocation of family financial assets from the perspective of health status and disease impact, and the research conclusions are different and are not unified. Some domestic and foreign scholars believe that health factors are the direct reasons of family asset selection behavior, that is, there is a direct causal relationship between the two. In this view, Rosen and Wu (2004)[5] took the lead in health and portfolio research, using Health & Retirement Study (HRS) data to find that investors 'health does affect their families' asset selection behavior.Some foreign scholars have reached a similar conclusion (Colie et al, 2009[6]). Lei Xiaoyan and Zhou Yuegang (2010) [7]used the data of China health and pension tracking survey and found that the health status of family members has an important impact on family asset allocation and the choice of family investment, and this conclusion is consistent with the research results of Ma Lili et al. (2011)[8] .Other scholars hold a different view, they believe that there is no direct causal relationship between health factors and family asset allocation, that is, the health status of family members on family asset allocation is not significant.

In conclusion, reviewing the literature found that health shocks have a significant impact on household asset selection behavior. The main reasons are as follows: first, different scholars adopt different research methods; second, different scholars adopt different measures of health status. The innovation of this paper lies in: first, improve the measure of disease influence. Compared with the existing studies, in many cases, most of the existing studies introduce disease impact as exogenous variables into the model, and measure the impact of disease based on the health status of family

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members, and do not analyze it from the perspective of endogenous variables such as family health expenditure (chalk Clearing, 2012)[9]； Lei Xiaoyan and Zhou Yuegang, 2010[7]. Therefore, the health status in these studies is very subjective, and can not be used as an objective and scientific indicator. The calculation and research of the model is not scientific and rigorous enough, so it is impossible to accurately measure the impact of disease on asset allocation. In contrast, in the study of this problem, only very few scholars will medical expenditure as an endogenous variable, and even the medical expenditure as an endogenous variable introduction model, is usually using the absolute amount of medical expenditure, namely the family in solve the disease problem for family members pointed out the cost, also rarely consider the proportion of health expenditure in the family spending. In this respect, if a family's income can easily deal with the impact of medical expenses, namely medical expenses only occupies a small proportion of family income or family expenses, medical expenses will not necessarily significantly affect the family asset allocation, thus, the use of the absolute amount of medical expenses to measure the impact of disease on the family is not accurate enough. To address this issue, this paper draws on the WHO definition of catastrophic health expenditure and defines disease effects as "the proportion of household out-of-pocket hospitalization expenses to non-food consumption expenditures. "This not only avoids the subjectivity of health conditions, and overcome the purely medical spending to measure health impact and ignore the proportion in spending, so that the model building more scientific and rigorous, also can better objective analysis of the research results, so as to better scientific analysis of the impact of the family asset allocation. Second, the discussion of asset allocation is more specific and in-depth. This paper mainly studies financial assets or risk assets, including stocks, funds, financial products, etc. Because these assets have strong liquidity and a short cycle, they are easy to change with the wishes of residents, so they are more sensitive to changes in health or other factors. In order to conduct a more rigorous discussion, this paper chooses to include commercial insurance in the research scope, because commercial insurance is an important financial asset, and the existing literature is rarely involved in considering the household financial asset allocation.

3. Model Setting, Indicator Selection, Data Source

3.1 Model Setting

In order to investigate the impact of the health status of family members on family investment, since the main explained variable "whether to hold an asset" is a binary discrete virtual variable with values 0 and 1, Logit and Probit models are used to study the impact of health status on family investment. The model is constructed as follows:

$$Y = 1\left(\alpha Health + \beta X + \mu > 0\right) \quad (1)$$

If the family holds the asset, Y is 1 and if not, it is 0.Health indicates the health level of family members, and X indicates the control variable.

3.2 Selection of Indicators

(1) Interpreted Variable. This paper refers to the practice of Rosen and Wu (2004)[5], with whether to hold financial products, stocks, funds as the explained variables, the holding value is 1, otherwise the value is 0.

(2) Explanatory Variables**.** Health: Using the questionnaire, "What do you think of your physical condition compared to your peers?" According to the question, according to the answer, this article will be" very good "," good "," general "," bad "," very bad " respectively assigned to 1~5, the bigger the value, the worse the health status.

(3) Control Variables**.** In order to control the influence of other factors on the results, the following control variables are also included: property market value (house): measured by the log value of the market value of the current home. Head of household sex (gender):1for men and 0 for women. Marital Status (marriage). Education (education): measured by years of education, 0 if degree is missed, 6 if primary degree, 9 if secondary school, 12 if high school or secondary school, 14 if junior degree, 16 if bachelor or above. Age: the age of the householder. Age square (age_d): age of householder * age of householder. Total family income (income): Real Total family income (log in number).

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3.3 Data Source

The data in this paper are derived from the China Household Finance Survey Chinese Family Finance Survey (CHFS) launched by the China Family Finance Survey and Research Center of Southwestern University of Finance and Economics. The sample covers 29 provinces (autonomous regions and municipalities directly under the Central Government), 355 counties (districts and county-level cities), and 1,428 village (residential) committees, with a sample size of 40,011 households.The descriptive statistics for each variable are reported in Table 1.

Table 1: Descriptive Statistics of the Variables

variable	observed value	average value	standard error
licai	40000	0.0410	0.199
gupiao	40000	0.0860	0.281
jijin	40000	0.0310	0.174
health	40000	2.613	1.016
house	27000	12.46	1.897
gender	40000	1.207	0.405
marriage	40000	2.399	1.237
education	110000	3.476	1.788
age	40000	55.20	14.25
age_d	40000	3250	1589
income	40000	8.890	19.31

4. Empirical Analysis

4.1 Base Data Regression

Table 2: Datum Regression

	(1) logit	(2) probit	(3) logit	(4) probit	(5) logit	(6) probit
	financing product		shares		fund	
health	-0.098***	-0.050***	-0.088***	-0.047***	-0.173***	-0.080***
	(-2.71)	(-2.87)	(-3.22)	(-3.31)	(-4.06)	(-4.11)
house	0.727***	0.343***	0.775***	0.400***	0.712***	0.323***
	(27.75)	(26.98)	(38.32)	(38.06)	(23.53)	(22.83)
gender	0.226***	0.107***	0.159***	0.097***	0.286***	0.143***
	(2.96)	(2.81)	(2.72)	(3.07)	(3.31)	(3.46)
marriage	-0.094***	-0.044***	-0.073***	-0.038***	-0.064	-0.030*
	(-2.76)	(-2.73)	(-2.67)	(-2.73)	(-1.61)	(-1.68)
education	0.009	0.005	0.006	0.004	0.024	0.011
	(0.54)	(0.53)	(0.49)	(0.57)	(1.17)	(1.13)
age	0.055***	0.027***	0.066***	0.031***	0.022	0.011
	(3.68)	(3.72)	(5.64)	(5.15)	(1.31)	(1.44)
age_d	-0.000***	-0.000***	-0.001***	-0.000***	-0.000	-0.000*
	(-3.34)	(-3.39)	(-7.29)	(-6.85)	(-1.63)	(-1.72)
income	0.006***	0.004***	0.007***	0.004***	0.005***	0.003***
	(6.62)	(7.93)	(7.15)	(8.78)	(5.18)	(6.13)
constant term	-14.155***	-6.940***	-13.461***	-7.024***	-13.126***	-6.304***
	(-24.80)	(-25.21)	(-31.30)	(-31.23)	(-20.75)	(-21.20)
N	22935	22935	22982	22982	22940	22940

In order to investigate the impact of family members' health status on holding wealth management products, this paper first regressed on the model (1), and the regression results are shown in Table 2. From column (1) of Table 2, it is not difficult to find that the influence coefficient of the health status of family members on whether to hold wealth management products is significantly-0.098, which means that health status significantly affects family asset allocation, and families with good health status are more inclined to hold financial management products. Further column(3) and column (5) of tables 2 respectively show the impact of health status on the holdings of two specific financial products of stocks and funds, and it can be seen that the declining health status will reduce the holdings of stocks

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and funds. The underlying reason is that when health declines or is hit by disease, large amounts of cash is needed for health care spending, thus reducing the holdings of financial assets, especially risky financial assets, to meet emergencies.

4.2 Heterogeneity Test

Nancy and Alexandra (2006)[10] divided the samples into agricultural and non-agricultural practices, testing the heterogeneity of financial management and stocks, respectively. The specific results are shown in Table 3. It can be seen that whether it is financial management or stocks, the impact of health factors on the agricultural population is much greater than that of the non-agricultural population. The potential reason may be that when the health status is impacted by the disease decline, a large amount of cash is needed for medical expenses, and there is still a large gap between the income of agricultural and non-agricultural population under the current urban-rural dual system in China. Compared to the non-agricultural population, the agricultural population needs to keep more cash to meet unexpected unexpected disease expenses. Therefore, increasing the income of agricultural population plays an important role in improving the participation rate of China's financial market.

Table 3: Test of Heterogeneity

	(1)	(2)	(3)	(4)
	agriculture	Non-agricultural	agriculture	Non-agricultural
	financing product		shares	
health	-0.258**	-0.073	-0.208***	-0.064*
	(-2.52)	(-1.61)	(-2.66)	(-1.84)
house	0.686***	0.547***	0.726***	0.563***
	(9.24)	(15.69)	(12.52)	(20.74)
gender	0.555**	0.058	0.043	0.040
	(2.23)	(0.62)	(0.21)	(0.57)
marriage	-0.062	-0.083**	0.028	-0.105***
	(-0.52)	(-2.05)	(0.30)	(-3.11)
education	0.023	0.014	-0.028	0.015
	(0.45)	(0.65)	(-0.73)	(0.93)
age	0.060	0.067***	-0.001	0.094***
	(1.21)	(3.51)	(-0.04)	(6.13)
age_d	-0.001	-0.001***	-0.000	-0.001***
	(-1.49)	(-3.25)	(-1.26)	(-7.52)
income	0.007***	0.006***	0.005***	0.008***
	(3.98)	(4.99)	(3.00)	(5.77)
constant term	-14.117***	-11.611***	-11.188***	-10.766***
	(-8.48)	(-15.71)	(-9.27)	(-18.94)
N	11233	9152	11263	9159

*、**、***Represents oted significant at 10%, 5% and 1%, respectively

4.3 Robustness Test

Table 4: Test of Robustness

	financing product		financing product
health	-0.352**	education	-3981.531
	(-2.31)		(-0.83)
house	54516.573***	age	6354.616
	(6.42)		(1.40)
gender	-2.32e+04	age_d	-37.619
	(-1.21)		(-0.91)
marriage	-2.37e+04***	income	2648.141**
	(-3.92)		(2.50)
constant term	-7.34e+05***		
	(-4.53)		
r2	0.137	r2	0.137
N	976	N	976

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To test the robustness of the above conclusions, this paper replaces the health status with medical expenditure, measures the participation degree of the financial management market with the total value of financial products, and uses OLS for auxiliary validation. Table 4 shows the regression results.It can be seen that the influence coefficient of health status is still significantly negative, indicating the conclusion of this paper.

5. Expand Analysis

In order to further study the impact of the health of middle family members on family investment, this paper uses the study of Li Peilin and Zhang Yi (2008)[11] to calculate the national per capita income in 2017. The income group between the average per capita income and 2.5 times is defined as the middle income person. The regression results are shown in Table 5. The regression results showed that the impact of middle-class health factors on financial management, stocks and funds was not significant. The potential reasons may be that China's middle class generally works in state-owned enterprises, public institutions and civil servants, and the income expectations is stable and guaranteed by "five social insurance and one housing fund". In addition, the middle class usually has a strong awareness of risk prevention. In addition to social medical insurance, it will also prevent huge expenditures caused by sudden diseases. Therefore, health factors have no significant impact on participation in the market compared with rural and low-income population.

Table 5: Expansion Analysis

	(1) logit	(2) probit	(3) logit	(4) probit	(5) logit	(6) probit
	financing product		shares		fund	
health	-0.029	-0.017	0.032	0.018	-0.091	-0.044
	(-0.53)	(-0.62)	(0.76)	(0.78)	(-1.43)	(-1.41)
house	0.494***	0.255***	0.551***	0.307***	0.478***	0.233***
	(12.18)	(12.22)	(17.06)	(17.28)	(10.05)	(10.08)
gender	0.100	0.059	0.128	0.078	0.233*	0.126**
	(0.89)	(1.01)	(1.45)	(1.55)	(1.83)	(1.97)
marriage	-0.023	-0.008	0.021	0.017	-0.122*	-0.056
	(-0.42)	(-0.30)	(0.46)	(0.67)	(-1.66)	(-1.61)
education	0.011	0.005	0.011	0.005	0.015	0.008
	(0.44)	(0.41)	(0.56)	(0.50)	(0.53)	(0.53)
age	0.065***	0.033***	0.068***	0.038***	0.050**	0.025**
	(3.08)	(3.05)	(4.06)	(4.06)	(2.03)	(2.10)
age_d	-0.000**	-0.000**	-0.001***	-0.000***	-0.000*	-0.000*
	(-2.32)	(-2.28)	(-4.86)	(-4.89)	(-1.83)	(-1.91)
income	0.072***	0.038***	0.064***	0.037***	0.081***	0.041***
	(5.93)	(5.94)	(6.63)	(6.64)	(5.75)	(5.77)
constant term	-12.250***	-6.449***	-11.564***	-6.524***	-11.600***	-5.910***
	(-14.47)	(-14.93)	(-17.50)	(-17.85)	(-11.99)	(-12.46)
N	6041	6041	6058	6058	6042	6042

*、**、***Represents oted significant at 10%, 5% and 1%, respectively

6. Conclusion

This paper examines the impact of family health status on investment choices for middle-class families. The results showed that from the whole sample status, health status has an impact on the family investment structure, the worse the health status, the less the family bought all kinds of investment products. Further, in the analysis of the middle class family sample was concluded that the effect of health status on the investment choice of middle class households was not significant.

Based on the above results, this paper can draw the following enlightenment: First, the government in the medical treatment, to reduce the medical burden from the degree of security, promote the benign development of the family, and improve the family welfare. Second, fundamentally speaking, we should vigorously develop the economy and expand the proportion of middle-income groups, so as to promote the development of China's financial market.

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