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Research on the Safe Growth of Risky Financial Assets of the Middle-aged and Elderly Population: Take Stock Investment as an Example

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Abstract:

Promoting the conversion of middle-aged population pension savings to investment, promoting property income security, is an important measure to actively address the aging of population. Studies have been studied that financial literacy and stock proportional and income are in parallel, but this paper adds to the reconstruction of financial literacy. After group research, it is found that (1) Pension financial literacy and middle-aged population stock market participation is significant. The "logarithmic" relationship of the marginal decrement; (2) Relationship with the stock profit is "bridge". This is proposed to propose differentiated suggestions to facilitate the safety growth of middle-aged population risk financial assets and promote the healthy development of pension finance.

Keywords: *Pension Financial Literacy; Stock Investment; Safe Growth; Differentiated Countermeasures.*

I. INTRODUCTION

The "14th Five-Year Plan" has made it the main objective of the country's economic and social development to improve the quality of the people, improve people's well-being and build a new development pattern. Guiding social capital to participate in investment plays a positive role in promoting the formation of a new development pattern with domestic circulation as the main body and domestic and international mutual promotion. The middle-aged and the elderly are not only the important influencing factors of national quality and people's livelihood, but also the important source of social capital. From a micro personal point of view, the participation of the middle-aged and elderly groups in the financial market opens up diversified investment channels for families, which can effectively improve the financial well-being of families [1] and ease the old-age crisis. From a macro-national perspective, the safe growth of risky financial assets of middle-aged and elderly people (including the increase of assets and investment income) not only helps to actively cope with the aging of the population, but also promotes the cultivation of a complete domestic demand system and the construction of a strong domestic market. However, at present, the conservative concept of pension money management and investment concepts of the aged is not conducive to the safe growth of family risk financial assets [2]. The stock market, as an important channel for the allocation of family risk financial assets, will promote the conversion of savings into

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investment and promote economic growth. Therefore, it is of great theoretical and practical significance to study the safe growth of risky financial assets of middle-aged and elderly people based on the case study of stock investment, which can organically combine several development strategic objectives and help realize the "14th Five-Year Plan".

With regard to the growth of the number of financial assets, Cohn (1975) believed that the larger the size of assets, the greater the breadth and depth of family participation in the financial market [3], the more conducive to the safe growth of risky financial assets. In addition, more and more scholars begin to pay attention to the background risk for the increase of investment income, which refers to other risk factors other than fluctuations in the price of financial assets borne by investors in the process of financial asset allocation, and is related to the individual or family characteristics of investors. Among them, age, financial literacy, social interaction, credit constraints, labor income risks, health risks, etc. will all have an important impact on the allocation of financial assets [4-9]. The theoretical research from the perspective of risk preference and asset size has been relatively mature, but the research from the perspective of background risk has not yet formed a complete system [10], which will be further improved on the basis of this paper.

As financial literacy plays an important role in the background risk, experts and scholars have long attached importance to the related issues of financial literacy and family financial decision-making. The higher the financial literacy, the more willing people are to invest in risky financial assets, to promote the increase of property income, and to change pension savings into pension appreciation [11]. However, financial literacy is not always beneficial. It will also restrict the improvement of household investment income through the influence of rural household registration and residents' age [12]. On the whole, the existing literature has made a useful exploration of the relationship between financial literacy and investment financing, but focuses on the traditional financial literacy, which is still insufficient to explain the relationship between the level of financial literacy and family financial assets in the context of aging.

In the context of increasing aging, the public will take more account of pension planning when making investments to resist the risk of longevity. To achieve the goal of safe growth, middle-aged and elderly people need to diversify their risks on the one hand, and increase the proportion of risky assets on the other hand to obtain investment income. However, according to the data of China Aging Finance Survey Report (2020), the public has a relatively low level of pension finance knowledge, and 63.29% of the respondents regarded "ensuring the security of principal first, regardless of earnings" as their long-term goal in pension money management or investment, while only 18.23% and 15.97% of the respondents set their long-term goals as "catching up with the inflation rate, being able to maintain purchasing power" and "significantly surpassing inflation and realizing the appreciation of pension wealth beyond maintaining purchasing power" [2]. On the one hand, this shows that the public attaches great importance to the safety of pension money management, on the other hand, it also reflects that the public has a conservative investment concept, which has a certain negative impact on the maintenance and appreciation of pension wealth and the effective use of social capital.

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Therefore, it is speculated that the cognition of pension money management may affect the path selection of family wealth reserve to a great extent. Groups with a higher knowledge level of pension money management can better participate in the financial market and match pension financial products with different risk levels through their own characteristics, so as to realize the safe growth of assets, while groups with a lower level of knowledge of pension money management is often unable to obtain better earnings through good asset allocation, which leads to the difficulty in maintaining and increasing the value of pension wealth. Therefore, in this paper, the attempt is made to bring the pension indicators into the measurement system of financial literacy, generate pension financial literacy, and explore whether it will produce different results in the safe growth of risky financial assets compared with traditional financial literacy. In the financial market, the stock is characterized by high returns and high liquidity, and the residents have a strong desire to invest in it [13], so the focus of this paper is put on the middle-aged and the elderly stock investment.

Regarding the influence of financial literacy on the participation of the stock market, most scholars believe that financial literacy has a significant positive impact on the proportion of risky financial assets in total assets [14,15]. However, according to the life cycle model, Kevin (2015) found that the current assets held by residents before retirement will increase with age, and the risk-free financial assets will increase accordingly after retirement [16]. Therefore, it is believed that the financial literacy added with the pension factor has a positive impact on the participation of the middle-aged and elderly population in the stock market as a whole, but the impact degree gradually weakens. Thus, the following hypothesis is made:

H1: There is a significant positive correlation between pension financial literacy and stock market participation, with a marginal decreasing "logarithmic" relationship.

For the stock earnings, most scholars believe that financial literacy confidence bias has an inverted U-shaped impact on household wealth [17]. However, we believe that with the improvement of financial literacy for the elderly, the return on investment for the elderly with low financial literacy for the elderly will increase. For the group with medium level of pension financial literacy, although financial literacy can improve the return on investment, we believe that pension financial literacy has little impact on stock earnings considering the risk cannot be spread [18]. The elderly and middle-aged people with high financial literacy may also fall into the "financial consumption trap" of excessive consumption of risky financial assets and services due to overconfidence, resulting in huge losses of old-age assets. Thus, the following hypothesis is made:

H2: Financial literacy for the aged has a "bridge" (∩) relationship with stock profits. In other words, for the groups with low pension financial literacy, the improvement of pension financial literacy is conducive to increasing the probability of stock profitability; for the group with medium financial literacy, financial literacy has no significant impact on stock earnings; and for the groups with high financial literacy, the financial literacy of old-age pension has a significant negative correlation with stock profits.

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II. DATA SOURCES AND INDICATOR DESIGN

2.1 Data Sources and Sample Selection

The data were selected from the financial research projects on urban household consumption in China carried out by the China Center for Financial Research of Tsinghua University in 2010 and 2011. A total of 24 cities were involved, and 5,273 valid questionnaires and 5,990 valid ones were collected, respectively. The questionnaire covers the basic information of the head of household, family financial information, assets and liabilities, retirement and insurance, financial knowledge and other aspects. Samples with heads of household aged 45 years and over were screened by combining the two-year data, removing outliers and missing values, and 2,799 observations were retained.

2.2 Related Indicators

2.2.1 Explanatory variables

Financial literacy indicators can be measured by objective indicators [19] and subjective indicators [20]. The objective financial literacy refers to respondents' answers to common financial questions to examine their mastery of financial knowledge, while the subjective financial literacy refers to their self-evaluation or their knowledge of financial common sense, both of which are of equal importance and have a direct effect on financial behavior, and reflect the degree of confidence of the respondents indirectly. In this paper, referring to Wu Weixing et al. (2018)’s method [21] of constructing subjective indicators by relying on financial common sense to understand the degree, the pension financial literacy indicators were obtained by adding pension indicators to improve financial literacy, and its influence on stock investment of middle-aged and elderly people was investigated.

Indicator of financial literacy for the aged (x): the answers to the questionnaire on "knowledge of financial products (stocks, funds and bonds)" and "knowledge of loan products of commercial banks (housing loans, car purchase loans, decoration loans, education loans, commercial operation loans and large consumer loans)" were used as indicators to measure subjective financial literacy. Taking into account the pension variables, the answers to the questionnaire on "current understanding of pension products" were included in the overall measurement system. In consideration of dimensional inconsistency, the data were standardized firstly before factor analysis. KMO showed an overall value of 0.896 and Bartlett sphericity test P=0.000, which was suitable for factor analysis [22]. Based on the results of principal component analysis, four principal factors with different loads were reserved, which are related to investment, pension, main liability and other liabilities. On this basis, a comprehensive evaluation was made, and the comprehensive score was calculated using the contribution rate of variance after rotation (52.921%, 14.809%, 8.685%, and 5.251%) as the weight. As the value obtained by principal component analysis was negative, in order to facilitate the later quantitative analysis, coordinate translation was used to eliminate the negative influence [23] to get the financial literacy indicator x for the aged according to the 3σ principle in statistics. In the following, pension financial literacy was divided into groups according

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to the quartile method for discussion. Table I shows the values of pension financial literacy calculated according to the quartile. The samples with pension financial literacy lower than the first quantile 2.528 were defined as the group with a low pension financial literacy, the samples with higher than or equal to the first quantile and lower than or equal to the third quantile were defined as the group with a medium pension financial literacy, and the samples with higher than the third quantile 3.344 were defined as the group with a high pension financial literacy.

Table I. Quantile of pension financial literacy

The first quartile	The second quartile	The third quartile
2.528	2.924	3.344

2.2.2 Explained variables

Stock market participation (p): The variable p was set as the stock market participation according to the number of shares held by the family. In the questionnaire, the number of shares held ranged from 1 to 11, with 1 indicating the holding amount was 0, 11 indicating greater than 10, and the remaining figures respectively indicating the specific number of shares.

The indicator of stock earnings (y): Two new variables were generated based on the questions of "net earnings from stock" and "net loss from stock" in the questionnaire: (1) earning or not: the indicator is a 0-1 variable, 1 represents profit, and 0 represents loss or break-even; (2) earning performance: a new ordered variable was generated by combining and re-assigning the "net profit" and "net loss" which were mutually exclusive. The variable value ranged from 1 to 7, with 1–3 representing loss that the smaller the number was, the more serious the loss would be; 5-7 representing earnings that the larger the number, the more earnings; 4 standing for break-even.

2.2.3 Control variables

It specifically includes the characteristic variables of the head of household–gender, age, Educational level [24,25] and the characteristic variables of the family–whether the family has financial planning throughout the year, whether social security can meet the retirement needs, and whether the family is engaged in the investment industry [26,27]. The descriptive statistical results in Table II show that the probability that the head of household is female is slightly higher than that of male, with an average age of about 52 years old, and the age ranges from 45 to 83 years old. An average Educational level of the head of household below 2 indicates that most of the samples have a low educational level. Most families have no financial planning for retirement, and their families are not engaged in the investment industry. More than half of them have social insurance to meet their needs after retirement.

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Table II. Description of control variables and descriptive statistics

Variables	Description of variables	Mean	SD	Min.	Max.
Gender of head of household	1 for male and 0 for female	0.39	0.49	0	1
Age of head of household	A continuous variable	52.27	6.55	45	83
Educational level of head of household	1 for junior high school and below, and 5 for doctor	1.86	0.66	1	5
A financial plan Yes/No	1 for yes and 0 for no	0.39	0.49	0	1
Can social insurance meet the needs after retirement	1 for yes and 0 for no	0.59	0.49	0	1
Family members from the investment industry Yes/No	1 for yes and 0 for no	0.13	0.34	0	1
Pension financial literacy	A continuous variable	3	0.55	2.34	5.45

The distribution of the characteristics of the heads of households in the pension financial literacy group in Table III shows that the proportion of the population aged 45 to 60 is larger in the group with a low pension financial literacy, and the proportion of the population aged 60 or above is larger than that of other groups; the proportion of female heads of households is higher than that of male heads of households, and the Educational level is mainly concentrated in junior, senior and lower levels. For the group with a medium pension financial literacy, the proportion of the population aged 45 to 60 rises to 90%, with no significant change in the gender ratio; the proportion of the population with high academic qualifications begins to increase, but it is still mainly in senior high schools and technical secondary schools. In the group with a high pension financial literacy, the proportion of the population aged 45–60 keeps increasing, and the proportion of the population over 60 is as low as 6%; the difference in the proportion of men and women has narrowed, but it is still dominated by women; the proportion of the population with higher academic qualifications at the undergraduate, junior college and postgraduate levels and above doubled, while the proportion of the population with lower academic qualifications at the junior secondary level and below decreases from the original 43.6% to 13.6%. From the observation of the average financial literacy of the heads of households in the rightmost column, the financial literacy of the elderly decreases with the increase of age, but increases with the increase of education level, and the financial literacy of men is significantly higher than that of women.

Table III. Distribution of characteristics of household heads grouped by their pension financial literacy

Household head characteristic variable	The proportion of household head characteristics of each pension financial literacy group			Average pension financial literacy
	Group with a low pension financial	Group with a medium pension financial literacy	Group with a high pension	

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		literacy		**financial literacy**	
Age	45 to 60 years old	0.812 9	0.914 3	0.938 6	3.025
	Over 60 years old	0.187 1	0.085 7	0.061 4	2.791
Gender	Male	0.377 1	0.373 1	0.417 1	3.034
	Female	0.622 9	0.626 9	0.582 9	2.979
Educational level	Junior high and below	0.435 7	0.297 5	0.135 7	2.803
	High school and technical secondary school	0.48	0.575 4	0.641 4	3.043
	Junior college or university	0.082 9	0.123 7	0.207 1	3.213
	Master or above	0.001 4	0.003 6	0.015 7	3.683

III. MODELING AND EMPIRICAL ANALYSIS

3.1 Pension Financial Literacy and Stock Market Participation

In consideration of the counting data that the explained variable is a non-negative integer, Poisson model was adopted:

$$log\big(E(p|x)\big) = \alpha + \beta x + \beta_1 x_1 + \cdots + \beta_n x_n$$

Where,

α= the constant term;

p=the stock market participation;

x= the pension financial literacy variable;

and $x_1 - x_n$ = the control variable.

Goodness of fit (estat gof) was used to test the model for good agreement with the data and the test was conducted after Poisson regression. The original assumption is that the model obeys Poisson distribution, and the original assumption should be rejected when the value of P is very small. The result of estat gof test showed that if the p value was 1, the original assumption would be accepted, and the data would follow the Poisson distribution.

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The test results of the total sample in column (1) of Table IV show that the regression coefficient of financial literacy for the aged is 0.202, which is significant at the level of 1%. The older the female population with higher education, the more kinds of stocks they hold; having family financial planning and family members engaged in the investment industry are conducive to enhancing the participation of the stock market.

Columns (2), (3) and (4) in Table IV are group discussions. According to the above method, the total samples were divided into the groups with a low, medium and high pension financial literacy. The results of columns (3) and (4) show that the pension financial literacy of the population with a medium and high level of pension financial literacy is significantly positively related to their participation in the stock market, but the influence coefficient becomes smaller, showing a "logarithmic" relationship of marginal decreasing. Column (2) indicates that the pension financial literacy of the population with a low financial literacy has no significant impact on their participation in the stock market, which may be due to the conservative investment caused by the limited funds, thus offsetting the positive effect brought by the financial literacy. Specifically, the majority of households with a low pension financial literacy have lower income than the medium and high-level households by calculating the mode of household net income in groups, and the income level has a positive effect on the emotional state of investors [28]. The lower the income, the more conservative the investment, and the more unfavorable their participation in the stock market.

Table IV. The impact of financial literacy on stock market participation

Variables	**(1)**	**(2)**	**(3)**	**(4)**
	Total sample	**Group with a low pension financial literacy**	**Group with a medium pension financial literacy**	**Group with a high pension financial literacy**
Pension financial literacy	0.202*** (0.000)	0.6018 (0.270)	0.195 8* (0.050)	0.157 4** (0.024)
Gender of head of household	-0.066 4** (0.039)	-0.031 9 (0.657)	-0.038 9 (0.409)	-0.131 7** (0.018)
Age of head of household	0.007 4*** (0.002)	0.005 9 (0.205)	0.006 8* (0.072)	0.010 6** (0.020)
Educational level of head of household	0.118 6*** (0.000)	0.043 8 (0.436)	0.945 4*** (0.008)	0.150 3*** (0.000)
A financial plan Yes/No	0.189 2*** (0.000)	0.250 5*** (0.002)	0.161 6*** (0.000)	0.168 6*** (0.004)
Can social insurance meet the needs after retirement?	-0.014 4 (0.648)	0.040 9 (0.560)	0.009 5 (0.836)	-0.092 7* (0.099)
Family members from the investment industry Yes/No	0.557 6*** (0.000)	0.459 9*** (0.001)	0.720 7*** (0.000)	0.422 4*** (0.000)

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Constant term	-0.959*** (0.000)	-1.776 9 (0.192)	-0. 905 7** (0.015)	-0.968 1*** (0.008)
Net household income of last year (ten thousand)	5	3	5	6

Note: The data in brackets are P statistics, and * * *, * * and * * respectively represent significance at 1%, 5% and 10%, the same below.

3.2 Pension Financial Literacy and Stock Earnings

Firstly, 575 samples were left after excluding those did not participate in the stock market. Given that this indicator was ranked data, multivariate ordered model Ologit was used for analysis:

$$L_j(x_j) = log\left[\frac{Pr(y_i \le j|x_i)}{Pr(y_i > j|x_i)}\right] = a_j + x\beta$$

Where,

x = the variables that affect the earning performance, including explanatory variables and control variables;

β= the coefficient matrix corresponding to x;

J =the set of categories representing stock earning performance, $j \in J = \{-13, -12, \cdots, 0, \cdots, 12, 13\}$;

a_j =the intercept term.

There are two preconditions for Ologit to be used to deal with classified variables: (1) There is no significant multicollinearity among independent variables; (2) Meet the parallel line hypothesis. Therefore, first of all, the multicollinearity was tested using the variance inflation factor (VIF) and the mean value was 1.06(<5). The variance inflation factors of each variable were less than 1.2, indicating that there was no severe multicollinearity. Secondly, the parallel line test was performed and the significant value was 0.152(>0.05), indicating that the parallel line hypothesis was met.

The test results of the total sample in column (1) of Table V show that the pension financial literacy has a significant negative correlation with the stock earnings. It is often believed in the existing research that financial literacy has a positive effect on property income [29], but some scholars have found that with the improvement of financial literacy, especially financial knowledge, investors' risk preference will be reduced, and the conservative risk preference is unfavorable to investment returns [30]. Pension financial literacy may inhibit investment returns through other intermediate variables. Most indicators in the control variables have different degrees of correlation with stock earnings. The younger the male population with

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higher education, the more stock earnings. Social insurance's meeting the needs after retirement is also positively related to stock earnings.

Table V. The impact of financial literacy on stock profits

Variables	(1)	(2)	(3)	(4)
	Total sample	Group with a low pension financial literacy	Group with a medium pension financial literacy	Group with a high pension financial literacy
Pension financial literacy	-0.269** (0.045)	3.158 5** (0.010)	0.145 8 (0.763)	-1.000 3** (0.024)
Gender of head of household	0.328 7** (0.036)	-0.137 3 (0.741)	0.3063 (0.162)	0.272 8 (0.405)
Age of head of household	-0.026 9** (0.04)	-0.051 3 (0.149)	-0.017 8 (0.331)	0.008 (0.761)
Educational level of head of household	0.255 2** (0.029)	-0.173 1 (0.535)	0.444 3** (0.013)	0.306 7 (0.164)
A financial plan Yes/No	0.173 1 (0.268)	0.197 (0.619)	0.256 7 (0.239)	-0.3693 (0.287)
Can social insurance meet the needs after retirement?	0.415 5*** (0.007)	0.585 6 (0.124)	0.548 5** (0.012)	-0.016 2 (0.962)
Family members from the investment industry Yes/No	-0.059 4 (0.698)	0.0328 (0.939)	0.188 3 (0.378)	-0.447 2 (0.157)

In column (4), the test results of the group with a high pension financial literacy show that: Pension financial literacy has a significant negative correlation with stock earnings, which may be due to the overconfidence brought by excessive pension financial literacy, leading to excessive consumption and falling into the "financial consumption trap". But it has no significant impact on the groups with a medium financial literacy. The group with a low pension financial literacy no longer applies the Ologit model because it fails to pass the parallel line test, so the influence of pension financial literacy on whether or not it is profitable was not studied. The "profit or not" is a variable of 0-1, which can be measured by Logit model. In column (2), the result of Logit regression shows that for the group with a low pension financial literacy, the improvement of pension financial literacy can increase the possibility of stock earnings; the overall pension financial literacy has a "bridge" influence on stock earnings, as shown in Fig 1.

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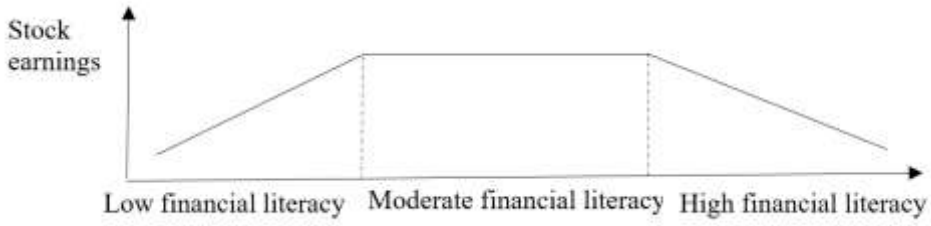

Fig1: bridge diagram

IV. ROBUSTNESS TEST

In this paper, the robustness test was carried out from two aspects: the reconstruction of pension financial literacy indicators and the replacement of similar models.

First of all, using Lusardi & Michell(2005) for reference to the method of summing up the scores of answering questions [31], the indicators were analyzed by using the direct addition substitution factor. After standardizing the data of "knowledge of financial products", "knowledge of loan products of commercial banks" and "knowledge of current pension products", a new indicator of pension financial literacy was directly generated by summing them up. Columns (1) and (2) in Table VI show the impact of pension financial literacy (direct sum) on stock market participation and stock earnings. The results show that: pension financial literacy (direct sum) has a significant positive impact on the stock market participation of the middle-aged and elderly population, and a significant negative impact on earnings. The conclusion is consistent with the previous.

Table VI. Robustness test

Variables	**(1)**	**(2)**	**(3)**	**(4)**
	Pension financial literacy (direct totaling)	**Pension financial literacy (direct totaling)**	**Negative binomial regression model**	**Oprobit model**
	Participation	Earning performance	Participation	Earning performance
Pension financial literacy	0.009 1*** (0.000)	-0.022** (0.0355)	0.22*** (0.000)	-0.160 2** (0.045)
Gender of head of household	-0.087 3*** (0.007)	0.294 8* (0.059)	-0.066 4** (0.021)	0.18* (0.053)
Age of head of household	0.008 5*** (0.001)	-0.023 8* (0.063)	0.007 4*** (0.000)	-0.016** (0.041)
Educational level of head of household	0.107 2*** (0.000)	0.287 9** (0.013)	0.118 6*** (0.000)	0.154** (0.027)

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A financial plan Yes/No	0.150 5*** (0.000)	0.216 9 (0.167)	0.189 2** (0.000)	0.116 4 (0.212)
Can social insurance meet the needs after retirement?	-0.006 5 (0.838)	0.397 7** (0.010)	-0.014 4 (0.627)	0.243 8*** (0.008)
Family members from the investment industry Yes/No	0.517 9*** (0.000)	-0.044 6 (0.769)	0.557 6*** (0.000)	-0.036 9 (0.684)

The second is model replacement. In a sense, Poisson regression and negative binomial regression are just like the relationship between OLS and WLS in the linear model, and their conclusions are not much different. Therefore, negative binomial regression was used instead of Poisson's regression in robustness test to test the impact of pension financial literacy on stock market participation. The negative binomial regression results in column (3) show that there is a significant positive correlation between pension financial literacy and stock market participation at the level of 1%.

In Ologit, the random variables are assumed to obey the logical probability distribution, and in Oprobit, the random variables are assumed to obey the normal distribution, both of which are suitable for the ordered discrete dependent variable probability model. Therefore, the Oprobit model can be used instead of Ologit to verify the robustness of the influence of pension financial literacy on the stock earnings. The results of Oprobit test in column (4) show that there is a significant negative correlation between pension financial literacy and stock earnings. The data in Table VI all indicate that the robustness test has been passed.

V. CONCLUSIONS

In this paper, the relationship between financial literacy indicators and stock investment of middle-aged and elderly people was investigated by using the survey data of household consumption finance of urban residents in China. The results of the study show that, on the whole, the middle-aged and elderly population in China generally have a low pension financial literacy, and improving pension financial literacy is conducive to improving stock market participation, but not conducive to increasing stock earnings. Specifically, the pension financial literacy has a marginal decreasing "log" relationship with stock market participation, and a "bridge" relationship with stock earnings. That is to say, the middle-aged and elderly groups with a low pension financial literacy are mostly elderly groups over 60 years old, mainly women, with generally low academic qualifications. Improving their pension financial literacy can improve the possibility of financial income growth. Middle-aged and elderly people with a moderate financial literacy show the characteristics of increasing middle-aged people aged 45-60, and their academic qualifications are mainly high school and technical secondary school. Improving their pension financial literacy can only increase their assets, but it has little impact on investment income. The middle-aged and elderly groups with a high pension financial literacy show the characteristics of more men and higher

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educational level. Improving their pension financial literacy may lead to overconfidence, blind investment and even loss of earnings. In summary, the following differentiated countermeasures and suggestions are put forward for the middle-aged and elder groups with different pension financial literacy:

The middle-aged and elderly people with a low pension financial literacy should be educated in pension financial literacy, with emphasis on improving their financial knowledge and skills. Financial education activities should be as easy to understand as possible, so that most groups can easily and accurately master relevant financial and pension knowledge. At the same time, the elderly should be encouraged to actively participate in re-education, and the traditional university for the elderly should be combined with the current information technology to promote the diversification of financial education for the elderly, to provide a variety of channels for the group to obtain financial knowledge and skills, to create an environment of "learning for the elderly", and to build a pattern of "worthiness of the elderly". This group should be encouraged to participate in the broad financial markets to promote the growth of risky financial assets.

The middle-aged and elderly people with a medium pension financial literacy should be provided with extensive and continuous daily pension financial literacy education, emphasizing investment efficiency while continuing to strengthen their pension financial literacy. It is necessary to accumulate investment experience and disperse risks by means of simulation of stock trading, break through existing investment bottlenecks, form value investment and realize the transformation from participation in financial market to profit by relying on digital development background and using digital financial technology.

The focus of educating the middle-aged and elder people with a high pension financial literacy should not be put on the improvement of financial knowledge and skills, but on strengthening risk awareness, improving overconfidence in behavior and attitude, strengthening the risk awareness of these families on financial products, and reducing irrational behavior. This group should be helped to establish a sound investment philosophy, a comprehensive consideration of the safety and profitability of investment, to avoid blind consumption of risk financial products. At the same time, the development of overconfidence measurement mechanism should be accelerated to protect the safe growth of risky financial assets.

Under the policy background of active aging, in order to promote the participation of the middle-aged and elderly population in the financial market and increase the investment income, differentiated countermeasures should be taken according to the heterogeneous characteristics of them, and a multi-level and orderly combination policy system should be explored to realize the safe growth of the risk financial assets of them at different levels and the healthy development of pension finance.

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