



## Entrepreneurial participation depth on household risky financial asset allocation

Limiao Zhang<sup>1</sup>

Wenjia Zhang<sup>2\*</sup>

Yancong Wang<sup>3</sup>

<sup>1,2,3</sup>School of International Economics, China Foreign Affairs University,  
100037 Beijing, China.

<sup>1</sup>Email: [zhang\\_li\\_miao@163.com](mailto:zhang_li_miao@163.com)

<sup>2</sup>Email: [wzhang@cfau.edu.cn](mailto:wzhang@cfau.edu.cn)

<sup>3</sup>Email: [wangyancong@cfau.edu.cn](mailto:wangyancong@cfau.edu.cn)



(+ Corresponding author)

### ABSTRACT

#### Article History

Received: 6 March 2023

Revised: 29 May 2023

Accepted: 14 July 2023

Published: 1 August 2023

#### Keywords

China

China household financial survey

Entrepreneurial participation  
depth

Entrepreneurship

Household risky financial asset  
allocation

Risky financial market.

#### JEL Classification:

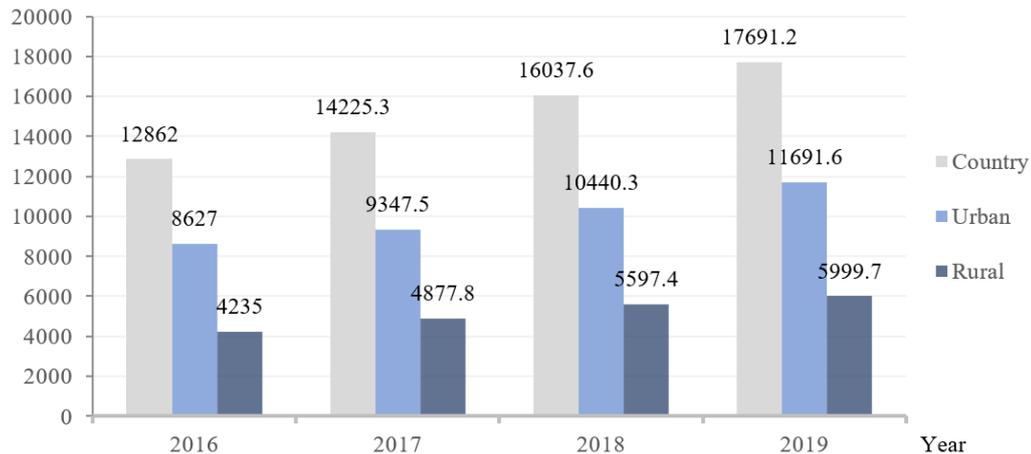
D13; G11; M13.

This paper aims to investigate the impact of entrepreneurial participation depth on household risky financial asset investments. The issue is examined using Probit and Tobit models based on the data of the 2017 China Household Financial Survey. First, the depth of entrepreneurial participation of entrepreneurs has a significant negative impact on whether their families participate in the risky financial market. Second, the more assets invested in entrepreneurship, the fewer households invest in risky financial markets. In addition, the depth of entrepreneurial participation would further squeeze out the degree of involvement in the risky financial market based on risk diversification and liquidity demand. Finally, the crowding out effect of entrepreneurial participation depth on household financial asset allocation differs between urban-rural duality and trust degree. This study further explains the mystery of limited participation in the risky financial market, helps understand the background risk characteristics of entrepreneurial families, promotes the scientific allocation of risky financial assets of related families and the stable operation of the risky financial market.

**Contribution/Originality:** This paper focuses on the crowding-out effect of Chinese households' entrepreneurial participation in risky financial investment and contributes to explaining the mystery of limited participation in risky financial markets.

## 1. INTRODUCTION

Under the guidance of the general direction of China's economic stability and progress, "business startups and innovation" reform has always been an important focus of China's supply-side structural reform and a key component of promoting employment. According to the yearbook of the National Bureau of Statistics of China (Figure 1), the number of entrepreneurs has continued to grow in recent years. In terms of the number of self-employed people registered with industry and commerce, the number has increased from 128.62 million in 2016 to 176.912 million in 2019. Both urban and rural areas have maintained a significant growth trend. According to the *Global Entrepreneurship Monitor 2016/2017 China Report*, China's entrepreneurship has made significant progress in many aspects such as ecology, finance, quality and policy support. 70.29% of the respondents believe that entrepreneurship is a good career choice, and 77.78% believe that successful entrepreneurs enjoy high social status.



**Figure 1.** The number of self-employed persons registered with industry and commerce.  
 Note: Data from the Yearbook of the National Bureau of Statistics of China (2016–2019).

Entrepreneurship is the source of vitality to promote economic development, and it is also an important background risk factor affecting household asset allocation. The initial capital of entrepreneurs often comes from household assets, and entrepreneurial investment is also a reallocation of the total household assets. Therefore, entrepreneurial activities are more like long-term risk capital based on the family, which is like risky financial investment to some extent. It should be noted that compared with the economic and time costs of entrepreneurial investment that are difficult to measure, although the rate of return of risky financial assets is also highly uncertain, investment choices can be hedged against each other to diversify the risk. People can ensure controllable and even considerable overall returns by allocating financial products with different proportions and risk degrees in the risky financial market.

However, from the stock market to the risky financial market, there is a phenomenon of “limited participation” of investors in both developed and developing countries (Haliassos & Bertaut, 1995; Mankiw & Zeldes, 1991). According to the *Risk Report on Household Financial Asset Allocation* released by Southwestern University of Finance and Economics (China) in 2016, the scale of assets of Chinese households is increasing, and the scale of assets available for investment also maintains a rapid growth. However, in terms of financial asset investment, the allocation proportion of Chinese households is relatively low, the investment varieties are single, and the financial market presents an obvious problem of limited participation, which is not conducive to the scientific allocation of household assets and the steady development of the risky financial market.

Given the risk substitutability between household entrepreneurship and risky financial investment, the extent of its impact on the puzzle of limited participation in risky financial markets can be further explored from the perspective of entrepreneurial inputs, extending the scope of contextual factors that cannot be ignored for capital markets. This paper relies on the 2017 China Household Finance Survey (CHFS) data to conduct a study to explore the impact of asset investment in household entrepreneurship on their participation in risky financial markets and asset allocation and to make recommendations. The research organization of this study is as follows: the second part reviews the literature on household entrepreneurship and limited participation in risky financial markets; the third part conducts theoretical analysis and proposes research hypotheses accordingly; the fourth part introduces the model and data used; the fifth part reports and discusses the empirical results; the sixth part clarifies the research conclusions and makes relevant policy recommendations.

## 2. LITERATURE REVIEW

### 2.1. Family Entrepreneurship and Its Impact

The family’s entrepreneurial decision will be affected by multiple dimensions such as social development, family status and entrepreneurs’ personal characteristics. At the social level, Kim and Cho (2009) found that in South

Korea, the public's entry into self-employment was largely due to the economic recession and the rising unemployment rate; [Zhichao Yin, Gong, and Guo \(2019\)](#) believed that the development of technology optimized the conditions for family entrepreneurship and also increased the probability of family taking the initiative to start a business. At the household level, [Ni \(2020\)](#) believed that the direct impact of household income on their participation in entrepreneurship was lasting and positive; [Paulson and Townsend \(2004\)](#) proposed that wealthier families are more likely to choose entrepreneurship and invest more money in it. At the individual level, the characteristics of entrepreneurs, such as gender ([Alvarez-Sousa, 2019](#)) age structure ([Liu, Wang, Cong, & Chen, 2022](#)) risk attitude ([Brachert, Hyll, & Titze, 2017](#)) and financial knowledge level ([Yin, Song, Wu, & Peng, 2015](#)) would have a subtle and profound impact on entrepreneurial behavior.

Similarly, starting a business have different effects on the economic structure of the family and the economic growth of the country. For entrepreneurial families, on the one hand, the high risk of entrepreneurial activities should not be underestimated, which will further increase the volatility of family income ([Berglann, Moen, Røed, & Skogström, 2011](#)) and people will also reduce their satisfaction with life due to entrepreneurial decisions ([Zhou, Jin, Fu, & Li, 2020](#)). On the other hand, the entrepreneurial choice is usually an independent decision, which can improve entrepreneurs' job satisfaction and overall happiness ([Zhou et al., 2020](#)) and improve the consumption level of corresponding families by increasing residents' income and expanding social networks ([Yang, Mao, & Yi, 2021](#)). Entrepreneurship has also become a way to solve the problem of poverty ([Bruton, Ketchen Jr, & Ireland, 2013](#)). From a macroeconomic perspective, entrepreneurship is an important part of national competitiveness ([Doan, 2021](#)) which can change the regional industrial structure ([Andersson & Noseleit, 2011](#)) and significantly stimulate economic development ([Peprah & Adekoya, 2020; Thomas, 2021](#)) which brings new possibilities for the country's economic growth and sustainable development ([Khyareh & Rostami, 2018](#)). However, some scholars have found through research that entrepreneurial behavior may also have some negative effects on the macro economy, which can increase social inequality ([Atems & Shand, 2018](#)) and is not conducive to economic growth and even reduce the national GDP (Gross Domestic Product) level ([Vatavu, Dogaru, Moldovan, & Lobont, 2022](#)).

## *2.2. Limited Participation of Households in Risky Financial Markets and Its Influencing Factors*

As early as the last century, some scholars have studied the mystery of limited participation in the stock market from different perspectives: [Mankiw and Zeldes \(1991\)](#) found that only a quarter of American households hold stocks, and their consumption fluctuates more, which has a higher correlation with excess returns. [Haliassos and Bertaut \(1995\)](#) further explored this phenomenon and believed that the other three quarters of American households did not buy stocks because of the deviation between investment inertia and expected utility maximization. [Heaton and Lucas \(2000\)](#) pointed out that even wealthy households do not hold more stocks due to high income and high variability.

The problem of limited participation in the risky financial market is the continuation and expansion of the mystery of limited participation in the stock market. According to the existing research, the causes of limited participation can be summarized into four categories, namely, market frictions, background risks, behavioral choices, and characteristics and capabilities.

Early scholars mainly explained the phenomenon of limited participation in the financial market from the perspective of market friction ([Zhou, 2020](#)). [Guiso, Jappelli, and Terlizzese \(1996\)](#) discussed that when there are transaction costs, the expectation of future borrowing constraints would encourage people to retain a lower proportion of risky assets. [Moon and DaeRyong \(2021\)](#) and [Albrecht, Kapounek, and Kučerová \(2022\)](#) studied the volatility or short-term impact of economic policy uncertainty (EPU) on the stock market.

Background risks has been studied more and more extensively in recent years, and it refers to a type of risk that can hardly be avoided by hedging or diversification in the portfolio, which increases the risk exposure of households and affect their asset allocation in the field of risky financial investment ([Zhou, 2020](#)). Health risk is an

important part of it. Atella, Brunetti, and Maestas (2012) found that perceived health is more important than objective health by using SHARE (European Survey of Health, Aging and Retirement) data, and consistent with background risk theory, health risk affects portfolio choice only in countries with less protective health care systems. In addition, housing investment (Le Blanc & Lagarenne, 2004) human capital (Ehrlich, Hamlen Jr, & Yin, 2008) insurance status (Angrisani, Atella, & Brunetti, 2018) and other aspects are the key factors for background risk coverage. In addition, individuals' behavioral choices are also very important for their participation in the risky financial market. For example, social network and interaction (Dierkes, Klos, & Langer, 2011) trust and happiness (Gogolin, Dowling, & Cummins, 2017) and risk attitude (Dimmock & Kouwenberg, 2010) are the focus of influencing family behaviors.

Characteristics and abilities cover the specific circumstances of individuals and their families, and are closely related to the threshold of participation in financial markets and the level of understanding. In terms of education level (Mankiw & Zeldes, 1991) financial knowledge and literacy (Gomes, Haliassos, & Ramadorai, 2021; Yin, Song, & Wu, 2014) professional investment advice (Shum & Faig, 2006) age (Cocco, Gomes, & Maenhout, 2005) gender (Campbell, 2006) income (Vissing-Jorgensen, 2002) marital status (Mandal & Brady, 2020) and the family structure and size (Yi, Zhou, & Yang, 2016) can have a great impact on the household asset allocation.

### *2.3. The Impact of Entrepreneurship on Household Risky Financial Investment Allocation*

Researches on entrepreneurship and family risky financial activities have been made much progress, but few scholars have paid attention to the direct impact of entrepreneurship on the family's participation in the risky financial market.

At present, some scholars have studied the negative impact of entrepreneurial behavior on the holding of risky financial assets from the perspectives of income risk, saving tendency and innovation and entrepreneurship environment. Heaton and Lucas (2000) found that the higher the income risk of entrepreneurial families is, the less the stock wealth they hold; Faig and Shum (2002) believed that when investors have the tendency to save for their own enterprises or families, their families are more likely to hold risky financial portfolios with high safety. Gentry and Hubbard (2004) found in their study on entrepreneurship and household savings that even rich entrepreneurial families had a very single investment portfolio, with most of their assets active in enterprises. Xiao, Huang, Chen, and Lin (2018) used the research data of 2011 and 2013 to find that the innovation and entrepreneurship environment has a positive effect on the asset allocation of rural families in cities.

However, the literature based on the impact of entrepreneurial activities on the allocation of household risky financial assets is relatively scarce, and the construction of entrepreneurial variables mainly focuses on the binary choice of whether to start a business. Huang (2021) mainly used CHFS data in 2015 and found that household industrial and commercial input would reduce the participation rate and investment proportion of households in the risky financial market by affecting debt risk.

To sum up, there is still much space for scholars to discuss the research on the impact of entrepreneurship on household venture financial investment focused in this paper. Starting from the impact of entrepreneurship and based on the indivisibility of risk capital and entrepreneurs' family assets, this study explores whether the depth of entrepreneurial participation could have a significant impact on the allocation of risky financial assets of relevant families, or even aggravate their limited participation.

## **3. THEORETICAL ANALYSIS AND HYPOTHESIS**

Entrepreneurship is an important engine of national economic development, and "mass entrepreneurship and innovation" is a great practice of China's supply-side economics theory and structural reform. In recent years, China's economic development cannot be separated from the promotion of business startups and innovation. First, we need to clarify the definition of entrepreneurship. The word "entrepreneur", originally derived from French, was

first introduced into the research field of economics by Cantillon, a French economist, in 1755. It refers to a person who takes financial risks in business activities. Entrepreneurial family refers to the family with one or more family members engaged in self-employment or ownership of enterprises, and the life of the family depends at least in part on the current and future output generated by entrepreneurship (Carter, Kuhl, Marlow, & Mwaura, 2017).

According to the *Global Entrepreneurship Monitor (GEM) Family Entrepreneurship Report (2019/2020)*, a sample of more than 150,000 adults in 48 economies, 75% of entrepreneurs and 81% of mature entrepreneurs jointly own or manage their businesses with family members. Entrepreneurial decisions are not only related to individuals, but also closely related to their families. It is because entrepreneurs and entrepreneurial families are intrinsically highly correlated, and this intersection cannot be studied without capital investment, that the asset allocation of entrepreneurial families will be greatly different from that of non-entrepreneurial families, which can be reflected in their participation in the risky financial market. Second, household risky financial investment includes household asset allocation including funds, gold, stocks, corporate or financial bonds, non-RMB (RenMinBi Yuan) assets, financial derivatives and financial wealth management products.

The impact of entrepreneurship on household risky financial investment is multifaceted due to the similar risk characteristics of entrepreneurial activity and risky financial investment. Hull, Bosley, and Udell (1980) found through research that people who own at least part of the ownership in enterprises have higher scores on the risk propensity scale than others, that is, they have higher risk preference, which positively affects household risky financial investment. Based on this, entrepreneurial asset investment should have a significant effect on households' risky financial investment, controlling for household risk preferences and corresponding subjective factors, and this effect is negative. Therefore, Hypothesis 1 is proposed as follows,

*Hypothesis 1: The more assets the household invests in entrepreneurship, the lower the probability of participating in the risky financial market and the lower the proportion of investment.*

At present, the academic research on the crowding out of family participation in the venture capital market by entrepreneurial activities mainly has two directions: one is to summarize entrepreneurship as a kind of background risk from the perspective of diversification, and then study the substitution relationship between the two; Second, from the perspective of liquidity, it is believed that entrepreneurs are more inclined to ensure current and future liquidity needs, so that entrepreneurial investment crowds out risky financial asset allocation (Ghahreman, 2016).

From one hand, it can be analyzed from a diversification perspective. First, the entrepreneur is a member of the family. Thus, the entrepreneurial decision is not only affected by the external environment and exogenous factors such as the family, but also has a strong reaction on the risky financial investment of the family and affects the asset allocation results of the family unit. As a high-risk investment that cannot be avoided by hedging or diversification in the asset portfolio, entrepreneurial investment directly affects the risk exposure faced by the family (Huang, 2021; Zhou, 2020) which has a certain degree of risk substitution with financial products. Therefore, we believe that the more attention entrepreneurial households have to financial knowledge (Feng, 2019) the more likely they are to pay attention to the risk substitution effect between entrepreneurial investment and risky financial investment, and then actively reduce the participation rate of risky financial market or reduce the holdings of financial products. Accordingly, Hypothesis 2 is put forward:

*Hypothesis 2: Entrepreneurial households may reduce their participation in the risky financial market based on their high attention to the financial sector.*

From another hand, it can be analyzed from the perspective of liquidity. If a family member chooses to start a business, part of the family wealth will be used for entrepreneurial investment, which would make the assets subject to liquidity constraints, and then affect the participation in the risky financial market. In other words, entrepreneurial families are more inclined to ensure sufficient liquidity needs now and in the future, so that entrepreneurial investment crowds out risky financial asset allocation (Ghahreman, 2016). Therefore, Hypothesis 3 is put forward:

*Hypothesis 3: Entrepreneurial households may reduce their participation in risky financial assets to meet liquidity needs.*

Entrepreneurial activities are an important embodiment of the national “mass entrepreneurship and innovation” reform, which can be affected by the basic economic and social conditions of China and the environmental factors of the regions. Due to the dualistic economic structure of urban and rural areas in China, there would be obvious gaps between urban and rural areas in entrepreneurship policy, financial availability, infrastructure construction and other aspects. Thus, Hypothesis 4 is proposed:

*Hypothesis 4: Hypothesis 1 There may be an obvious urban-rural binary difference.*

## 4. RESEARCH DESIGN

### 4.1. Model Setting

This paper studies the effect of the depth of entrepreneurial participation on households’ risky financial investment choice, and investigates the different effects on households’ risky financial investment choice and asset investment separately. Probit and Tobit models will be used depending on the type of the explanatory variables.

When the explanatory variable is household risky financial investment choice, that is, examining whether households participate in risky financial markets, the Probit model is applied to analyze because the explanatory variable is a dummy variable.

$$riskyfin^* = \alpha \times entre\_ratio + \beta X + \varepsilon \quad (1)$$

$$riskyfin = 1(riskyfin^* > 0) \quad (2)$$

Equation 1 demonstrates the effect of the depth of household entrepreneurial involvement on whether they participate in risky financial markets, and Equation 2 is a dummy variable measuring household participation in risky financial markets. Among them,  $\varepsilon \sim N(0, \sigma^2)$ ;  $riskyfin^*$  represents latent variable;  $riskyfin$  represents whether the household participates in risky financial investment, with participation equal to 1 and 0 otherwise;  $entre\_ratio$  represents the ratio of household entrepreneurial assets input to total assets;  $X$  represents the control variables.

When the response variable is household investment in risky financial assets, that is, the proportion of household risky financial investment is investigated, the Tobit model is used for analysis because the explained variable is a truncated variable:

$$riskyfin\_ratio^* = \alpha \times entre\_ratio + \beta X + \varepsilon \quad (3)$$

$$\text{and } riskyfin\_ratio = \max(0, riskyfin^*) \quad (4)$$

Equation 3 demonstrates the effect of the depth of household entrepreneurial involvement on their share of risky financial market investment, and Equation 4 is a range interval measuring the share of risky financial investment. Among them,  $\varepsilon \sim N(0, \sigma^2)$ ;  $riskyfin\_ratio$  represents the ratio of risky financial assets of households to total financial assets;  $riskyfin\_ratio^*$  represents the observed value of the proportion of risky financial assets between (0,1);  $entre\_ratio$  represents the ratio of household entrepreneurial assets input to total assets;  $X$  represents the control variables.

### 4.2. Data Source and Processing

The data applied in this paper come from the China Household Finance Survey (CHFS), which is organized and managed by the China Household Finance Survey and Research Center of Southwestern University of Finance and Economics. This paper uses the data from the fourth round in 2017, which covers 29 provinces (autonomous regions and municipalities directly under the Central Government), 355 districts and counties, and 1428 village committees, with a sample size of 40011 households.

Based on the research direction and referring to relevant literature, the data processing is as follows: first, in terms of household samples, only the sample of the head household is retained to avoid household duplication; Second, in terms of age, only the sample of household-headed households aged 18 to 65 is retained; Thirdly, samples with missing values of key variables, and samples with non-positive values of total household income and negative

values of household net assets are eliminated; Fourth, the variables of household net assets, total income, total liabilities and financial assets are censored at 1% to avoid the impact of extreme values. After data processing, a total of 12985 household samples that meet the research needs are obtained.

### 4.3. Variable Selection and Statistical Description

#### 4.3.1. Response Variables

Referring to the methods of Yin et al. (2014) and Huang (2021) this paper sets the main response variables as whether the household participates in the risky financial market and the proportion of risky financial assets in the household. According to the variable usage instructions of CHFS, financial assets include stocks, gold, funds, wealth management, deposits, bonds, derivatives, other financial assets, non-RMB assets, cash, loans, and balance of social security accounts. According to the definition of Yin et al. (2014) risky financial assets include funds, gold, stocks, corporate or financial bonds, non-RMB assets, financial derivatives and financial products. At the same time, since the stock is a typical risky financial asset, in the benchmark model, we also examine whether people hold the stock and the proportion of stock assets as supplementary response variables.

Table 1 illustrates the response variables applied in this paper. When the explanatory variable is whether the household participates in risky financial market activities or holds stocks, participation takes the value 1, otherwise, it takes the value 0; When the explained variable is the proportion of a household’s risky financial assets or stock assets, the proportion of the household’s risky financial assets or stock assets in financial assets is taken.

Table 1. Description of response variables.

Variables	Symbol	Type	Description
Holding risky financial assets	<i>Riskyfin</i>	Dummy	Yes: 1, no: 0
Proportion of risky financial assets	<i>Riskyfin_ratio</i>	Continuous	The ratio of household risky financial assets to financial assets
Holding stocks	<i>Stock</i>	Dummy	Yes: 1, no: 0
Proportion of stock assets	<i>Stock_ratio</i>	Continuous	The ratio of stock assets to financial assets

#### 4.3.2. Explanatory Variables

Table 2 presents the explanatory variable illustrated in this paper. Referring to the design of Yin et al. (2015) and Huang (2021) this paper selects the explanatory variable as the proportion of household entrepreneurial assets investment to measure the depth of household entrepreneurial participation. According to the questionnaire setting, entrepreneurship is defined as the relevant samples engaged in industrial and commercial production and operation projects, without considering the production and operation projects in rural areas. The variable “Proportion of household entrepreneurial investment” is used to represent the proportion of household asset investment in entrepreneurial activities in total assets.

Table 2. Description of explanatory variable.

Variable	Symbol	Type	Description
Proportion of household entrepreneurial investment	<i>Entre_ratio</i>	Continuous	The proportion of household entrepreneurial assets input to total assets

#### 4.3.3. Control Variables

Table 3 shows the description of the control variables. With reference to the previous literature and according to the requirements of this paper, the control variables are selected from the characteristics of individuals, families and regions. Among them, the level of household head is: age, age square / 100, gender, married, risk aversion, risk preference, years of education, health, employment, rural household registration, social medical insurance, party

member; The household level is: total household income, household net assets, household size and real estate; The regional level is: region and the average number of financial institutions available per 10,000 people in the province.

Table 3. Description of control variables.

Variables	Symbol	Type	Description
Characteristics of household head			
Age	<i>Age</i>	Continuous	The birth year of the household head is subtracted from 2017
Age squared over 100	<i>Age_sq/100</i>	Continuous	Age squared / 100
Gender	<i>Gender</i>	Dummy	Men: 1, women, 0
Marital status	<i>Marri</i>	Dummy	Married:1, others:0
Risk aversion status <sup>1</sup>	<i>Risk_aver</i>	Dummy	Yes: 1, others: 0
Risk loving status <sup>2</sup>	<i>Risk_prefer</i>	Dummy	Yes: 1, others: 0
Education in years	<i>Edu</i>	Categorical	Years of education are converted according to the degree option <sup>3</sup>
Health status	<i>Health</i>	Dummy	Healthy <sup>4</sup> : 1, others: 0
Employment status	<i>Job</i>	Dummy	Employed: 1, others: 0
Holding rural household registration	<i>Rural_resi</i>	Dummy	Yes: 1, no: 0
Holding social insurance	<i>Insur</i>	Dummy	Yes: 1, no: 0
Member of the communist party of China	<i>Status</i>	Dummy	Yes: 1, no: 0
Characteristics of family			
Total household income	<i>Total_income</i>	Continuous	Log of total household income
Household net worth	<i>Net_asset</i>	Continuous	Log of total household income minus total household liabilities
Family size	<i>hsize</i>	Continuous	Number of family members
Real estate status	<i>House</i>	Dummy	Owned: 1, others: 0
Characteristics of region			
Region	<i>Region</i>	Categorical	According to the province, it is classified into eastern, central, western and northeastern regions, and the values are 1, 2, 3 and 4
The average number of financial institutions available per 10,000 people in the province	<i>Fina_inst</i>	Continuous	According to the relevant data of the People's Bank of China and the National Bureau of Statistics, the average number of financial institutions that can be covered per 10,000 people in the corresponding provinces is calculated <sup>5</sup>

1 The question about risk attitude in the CHFS 2017 questionnaire is "If you have a sum of money to invest, which investment project would you most like to choose?", If the respondent chose "4. Slightly lower risk, slightly lower return project" or "5. Not willing to take any risk", they were considered risk averse, otherwise none.

2 Similarly, if the respondents choose "1. high-risk and high-return project" or "2. slightly high-risk and slightly high-return project," they are considered to have risk preference; otherwise, they do not.

3 According to the question "What is your educational level? 1. No schooling 2. Elementary school 3. Middle school 4. High school 5. Technical secondary school/vocational college 6. Junior college/higher vocational college 7. Bachelor's degree 8. Master's degree and 9. Doctoral degrees" are converted into 0, 6, 9, 12, 13, 15, 16, 19 and 22 years of education respectively.

4 The health-related question in the questionnaire was "How is your current physical condition compared to your peers?" If respondents choose "1. Very good" or "2. Good," they are considered healthy.

5 The data on financial institutions come from the [The People's Bank of China \(2018\)](#) released by the People's Bank of China. Since the data of Hainan Province in 2017 is missing, the statistical data of 2016 are used instead. The population of each province in China in 2017 is from the Statistical yearbook of the National Bureau of Statistics.

#### 4.3.4. Descriptive Statistics

The main variables and their descriptive statistics are shown in Table 4.

The statistical results show that in the sample of 12895 households, the number of households holding risky financial assets only accounts for 14.7%, while the number of households holding stocks accounts for 10.7%. As shown, the participation rate of Chinese households in the risky financial market is not high.

In the sample of 12,895 households, entrepreneurial investment accounts for 3.5% of the total household assets on average, and the highest investment depth can reach 98.1%.

At the level of control variables, from the perspective of individual characteristics, most respondents are male, accounting for 76%; the average age is about 49 years old; most of the household heads were married, accounting for 86.3%; 16.9% of the respondents are risk averse, 5% are risk preference, and most of the respondents prefer safe asset allocation; the average number of years of education of the respondents is 10.163 years, that is, close to the high school degree; 74.4% of the respondents were employed; more than half of the respondents self-perceived physical condition as healthy; 53.7% of the respondents had a rural household registration; social medical insurance was widely held, with 94.1% of the respondents owning insurance; among the household heads, 20.1% were members of the Communist Party.

In terms of family characteristics, the average total income is 97,900 yuan, most of them are two-member families, and 92.6% of the families own houses. In terms of regional characteristics, the average number of financial institutions available per 10,000 people in the province is 1.711.

**Table 4.** Descriptive statistics of the main variables.

Variables	Obs.	Mean	Std.	Min.	Max.
Holding risky financial assets	12985	0.147	0.354	0	1
Proportion of risky financial assets	12985	0.041	0.137	0	1
Holding stock assets	12985	0.107	0.309	0	1
Proportion of stock assets	12985	0.018	0.085	0	1
Proportion of household entrepreneurial investment	12985	0.035	0.113	0	0.981
Gender	12985	0.760	0.427	0	1
Age	12985	49.299	10.792	18	65
Age squared / 100	12985	25.469	10.106	3.240	42.250
Marital status	12985	0.863	0.344	0	1
Risk aversion status	12985	0.169	0.375	0	1
Risk loving status	12985	0.050	0.218	0	1
Education in years	12985	10.163	3.966	0	22
Health status	12985	0.523	0.499	0	1
Employment status	12985	0.744	0.436	0	1
Holding rural household registration	12985	0.537	0.499	0	1
Holding social insurance	12985	0.941	0.235	0	1
Member of the communist party of China	12985	0.201	0.401	0	1
Rural areas	12985	0.316	0.465	0	1
Total household income (10,000 yuan)	12985	9.790	10.827	0.030	83.300
Total household liabilities (10,000 yuan)	12892	5.616	14.567	0	130.200
Household net assets (10,000 yuan)	12985	108.588	166.243	0.415	1110.697
Log of total household income	12985	10.924	1.218	5.704	13.633
Log of household net worth	12985	12.935	1.538	8.331	16.223
Family size	12985	1.727	1.317	1	12
Real estate status	12985	0.926	0.262	0	1
The average number of financial institutions available per 10,000 people in the province	12985	1.711	0.291	1.170	2.300
Region	12985	1.995	1.073	1	4

Table 5. Probit and Tobit estimates: impact of the depth of household entrepreneurial participation on risky financial investment.

Four forms of regression	(1)	(2)	(3)	(4)
	Holding risky financial assets	Proportion of risky financial assets	Holding stock assets	Proportion of stock assets
Proportion of household entrepreneurial investment	-0.113*** (0.027)	-0.062*** (0.011)	-0.071*** (0.024)	-0.044*** (0.011)
Age	0.006*** (0.002)	0.003*** (0.001)	0.010*** (0.002)	0.005*** (0.001)
Age squared /100	-0.007*** (0.002)	-0.002*** (0.001)	-0.011*** (0.002)	-0.006*** (0.001)
Gender	-0.007 (0.007)	-0.004* (0.002)	0.000 (0.007)	0.002 (0.003)
Marital status	0.000 (0.009)	-0.002 (0.004)	0.002 (0.008)	-0.003 (0.004)
Risk aversion status	-0.021*** (0.007)	-0.006** (0.003)	-0.020*** (0.006)	-0.010*** (0.003)
Risk loving status	0.057*** (0.013)	0.026*** (0.004)	0.059*** (0.010)	0.026*** (0.005)
Education in years	0.015*** (0.001)	0.006*** (0.000)	0.012*** (0.001)	0.004*** (0.000)
Health status	-0.013** (0.006)	-0.004* (0.002)	-0.008* (0.004)	-0.000 (0.002)
Employment status	-0.023*** (0.006)	-0.010*** (0.002)	-0.018** (0.007)	-0.008*** (0.003)
Holding rural household registration	-0.074*** (0.008)	-0.032*** (0.004)	-0.071*** (0.008)	-0.030*** (0.004)
Holding social insurance	0.025* (0.013)	0.007 (0.006)	0.015 (0.013)	0.003 (0.006)
Member of the communist party of China	-0.009 (0.007)	-0.006* (0.003)	-0.010* (0.005)	-0.007*** (0.002)
Log of total household income	0.029*** (0.004)	0.011*** (0.002)	0.018*** (0.005)	0.004** (0.002)
Log of household net worth	0.056*** (0.005)	0.024*** (0.002)	0.042*** (0.004)	0.018*** (0.002)
Family size	-0.004 (0.003)	-0.002* (0.001)	-0.003 (0.002)	-0.001 (0.001)
Real estate status	-0.104*** (0.016)	-0.044*** (0.006)	-0.069*** (0.014)	-0.031*** (0.005)
The average number of financial institutions available per 10,000 people in the province	-0.002 (0.023)	0.005 (0.009)	-0.015 (0.024)	0.002 (0.010)
Obs., N	12985	12985	12985	12985
Regional effect	Controlled	Controlled	Controlled	Controlled
Pseudo R <sup>2</sup>	0.312	0.315	0.287	0.300

Note: The table reports the average marginal effect; Clustered robust standard errors in parentheses; \*, \*\* and \*\*\* denote 10%, 5% and 1% significance levels, respectively.

## 5. EMPIRICAL RESULTS AND ANALYSIS

### 5.1. Benchmark Regression Model

The first two columns of Table 5 are the regression of the depth of entrepreneurial participation on the household risky financial investment, and the last two columns are the further investigation of the stock assets. Among them, columns (1) and (3) are Probit estimates, and columns (2) and (4) are Tobit estimates.

According to the results, the average marginal effect of the ratio of household entrepreneurial investment to holding risky financial assets is  $-0.113$ . In other words, for every 1% increase in the depth of entrepreneurial participation, the corresponding households is 11.3% less likely to participate in the risky financial market. Similarly, households that participate in risky financial markets squeeze out 6.2% of risky financial assets. The marginal impact of the depth of entrepreneurial participation on households' participation and investment in the

risky financial market are significantly negative at the confidence level of 1%, which indicates that more assets households invest in entrepreneurial activities, the lower the participation rate in the risky financial market or the less risky financial assets they hold.

Moreover, as a subdivided type of risky financial assets, stocks also show similar results in the regression. The proportion of household entrepreneurial investment has an average marginal impact of  $-7.1\%$  on their stock holdings, and has an impact of  $-4.4\%$  on their stock assets, both of which are significantly negative at the level of 1%.

In addition, there are different effects on the explanatory variables in terms of the characteristics of the household head. The effect coefficient of age is significantly positive, while the square of age is significantly negative, which shows an inverted U-shaped influence trend of age and household risky asset participation and investment level rising first and then falling; Risk-loving households are more willing to take risks and tend to participate in risky financial markets, while risk-averse ones are the opposite; The years of education of household heads also significantly positively affects the risky financial investment behavior at the 1% confidence level; While household heads who perceive good health, have a job, and a rural household registration are less likely to allocate risky financial assets and may have a weaker tolerance for risk. At the household level, the coefficients of the effects of total household income and net worth in the regressions are both significantly positive at the 1% level, indicating that the higher the household's income and net worth, the more inclined the household is to participate deeply in risky financial markets; while the household's property holdings have an inverse effect on risky financial market participation, with property holdings crowding out the household's allocation decisions in terms of risky financial assets.

The combined estimation results are further analyzed, as scholars such as Heaton and Lucas (2000), Faig and Shum (2002), and Huang (2021) find that the depth of a household's entrepreneurial involvement has a significant crowding-out effect on its participation in risky financial markets. That is, the presence of entrepreneurial behavior tilts household assets toward entrepreneurship, and due to liquidity and safety considerations, reduces the allocation to risky financial assets.

In summary, the benchmark regression results reasonably verify Hypothesis 1.

## 5.2. Analysis of Mechanism

### 5.2.1. On A Diversification Perspective

Background risks is an important factor explaining limited participation in risky financial markets and has also been applied in numerous literatures. When entrepreneurial activities are examined in the field of background risks, entrepreneurship and risky financial assets can be regarded as two investment choices with risk substitution effect. Therefore, when the household chooses to start a business and increases its investment in entrepreneurship, it may have a crowding-out effect on the allocation of risky financial assets. This is consistent with the concept of "appropriate risk aversion" proposed by Pratt and Zeckhauser (1987) indicating that due to the unhedgeable background risks in private enterprises, entrepreneurs tend not to hold assets of other risk types in order to avoid risks.

Financial attention is one of the important indicators to judge the household's understanding of the risky financial market. For individuals, if they pay more attention to financial knowledge, they tend to lower the cognitive threshold for participating in the financial market, and then tend to participate in and hold certain risky financial assets (Feng, 2019). In order to further understand the risk avoidance mechanism based on the perspective of diversification, this paper constructs the interaction term of the proportion of household entrepreneurial investment and financial attention, and regards attention to economic and financial information as high financial attention, otherwise low financial attention. Thus, to explain the impact of entrepreneurial activity as a background risk by starting with individual characteristics.

Table 6 reports the results of the moderating effect of financial attention, which shows that the increase of financial attention has a significantly positive effect on households' holding or increasing the allocation of risky financial assets, indicating that the more individuals know about risky financial markets, the easier they are to accept and allocate risky financial assets, which is consistent with the results of Feng (2019). However, when the proportion of household entrepreneurial input significantly crowds out the allocation of risky financial assets, the interaction term of entrepreneurial input and financial attention, namely the average marginal effect of moderating effect, is significantly negative at the level of 1%. The results show that the increase of financial attention further strengthen the crowding-out degree of entrepreneurial investment on household risky financial investment, which increases the negative impact to a certain extent. This shows that entrepreneurs with high financial attention are better able to understand the operation of the financial market and its risk substitution with entrepreneurial activities, and prefer safer and more liquid assets while increasing the depth of entrepreneurial participation. Thus, they reduce the allocation of risky financial assets to reduce the overall risk, which verifies Hypothesis 2.

Table 6. Moderating effect of financial attention.

Two forms of regressions	(1)	(2)
	Holding risky financial assets	Proportion of risky financial assets
Proportion of household entrepreneurial investment	-0.102** (0.044)	-0.041** (0.020)
Proportion of household entrepreneurial investment × financial attention	-0.247*** (0.080)	-0.089*** (0.031)
Financial attention	0.115*** (0.009)	0.042*** (0.004)
Control variables	Controlled	Controlled
Obs., N	4548	4548
Regional effect	Controlled	Controlled
Pseudo R <sup>2</sup>	0.332	0.322

Note: The table reports the average marginal effect; Clustered robust standard errors in parentheses; \*\* and \*\*\* denote 5% and 1% significance levels, respectively.

### 5.2.2. On A Liquidity Perspective

Entrepreneurial investment can further explain the crowding out of household risky financial investment from the perspective of liquidity. Ghahreman (2016) believed that for the need of future liquidity, private enterprises would choose to take less risks in the financial portfolio. For example, households with illiquid personal projects such as businesses or houses tend to reduce the amount of risky assets they hold to ensure that they have timely access to liquidity when their projects need financing (Faig & Shum, 2002).

This paper introduces the variable of saving rate into the model to examine the liquidity demand of entrepreneurial households in groups. If the crowding out of the participation of entrepreneurial households with high savings rate in the risky financial market is significantly higher than that of households with low savings rate, it indicates that the high savings rate group further reduce the allocation of risky assets for liquidity needs. Referring to the practice of Yin and Zhang (2019) this paper defines the saving rate as the logarithmic difference between the total household income and total consumption, and sets the value of 1 for high saving rate and 0 for otherwise.

**Table 7.** Savings rates differences in the impact of household entrepreneurial input on risky financial investment.

Different level of savings	(1)				(2)			
	Holding risky financial assets				Proportion of risky financial assets			
	High savings rates		Low savings rates		High savings rates		Low savings rates	
	Marginal effect	Coefficient	Marginal effect	Coefficient	Marginal effect	Coefficient	Marginal effect	Coefficient
Proportion of household entrepreneurial investment	-0.214*** (0.032)	-1.142*** (0.215)	-0.040 (0.039)	-0.315 (0.229)	-0.088*** (0.013)	-0.538*** (0.103)	-0.038* (0.022)	-0.321** (0.138)
Control variables	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Obs., N	7279	7279	5706	5706	7279	7279	5706	5706
Regional effect	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Pseudo R <sup>2</sup>	0.296		0.319		0.301		0.318	
P-values for the test of differences in coefficients between groups	0.030				0.346			

**Note:** The table reports the average marginal effect; Clustered robust standard errors in parentheses; \*, \*\* and \*\*\* denote 10%, 5% and 1% significance levels, respectively.

Table 7 reports the main regression results for the savings rate as a basis for the grouping. As can be seen, for the high savings rate group, the average marginal effect of households' holdings of risky financial assets decreases by 21.4% for every 1% increase in the share of entrepreneurial inputs, significantly crowding out households' participation in risky financial markets at the 1% level. While, when households' savings rate is low, this crowding out effect no longer satisfies the statistically significant result and the marginal effect is small. When the explanatory variable is holding risky financial assets, the coefficients of the two groups of samples pass the SUEST test (the test based on the Seemingly Uncorrelated Regressions model, SUR). That is, the coefficients of the two groups are significantly different from each other, indicating that entrepreneurial households selectively participate in risky financial market investments due to liquidity considerations in order to ensure sufficient liquidity for the capital needed to start a business. When the explanatory variable is the share of risky financial assets, the depth of entrepreneurial participation significantly squeezes out risky financial assets invested by households with high and low savings rates at the 1% and 10% confidence levels, respectively, but the coefficients between the two groups are not significantly different and cannot be further compared. In general, entrepreneurial households with high savings rates are more cautious in their participation in the risky financial market. Considering the highly liquid assets needed to be invested in entrepreneurial activities and the liquidity of savings, relevant households tend to hold a wait-and-see attitude towards holding another financial asset with the same high risk as entrepreneurship, which squeeze out the holding of risky financial assets. In terms of the proportion of risky financial assets, both groups of household samples tend to reduce capital investment, which may be due to the need to shift funds to entrepreneurial investment to ensure sufficient funds for entrepreneurial activities. Therefore, the conclusion that risky asset allocation is crowded out based on liquidity needs is consistent with the previous prediction, which verifies Hypothesis 3.

### 5.3. Heterogeneity Tests and Analyses

#### 5.3.1. Macro Environment: Urban–Rural Duality

From the macro point of view, urban–rural dual economic structure is an important concern of China's economic and social development for a long time. Due to the differences in industrial structure and economic structure, there must be inequity and difference between urban and rural areas in innovation and entrepreneurship construction, modernization ability and the perfection of financial market.

In order to explore the heterogeneity of the macro environment, this paper further verifies the rationality of Hypothesis 4 through the grouped regression of the type of residence. According to the results reported in Table 8, the marginal impact of the depth of household entrepreneurial participation on rural households' holding of risky financial assets is not significant. For urban households, every 1% increase in entrepreneurial investment reduces their probability of participating in the risky financial market by 8.4%, significantly crowding out the holding rate of risky financial assets at the level of 1%, which is consistent with the conclusion of Huang (2021). It can be understood that due to differences in economic development conditions, local policies, financial availability and infrastructure construction, entrepreneurial activities in rural areas may be more concentrated in less risky fields, and the substitution of risky financial assets is not as highly related as that in urban areas. At the same time, after the SUEST test, the regression coefficients of the two grouped samples are also significant at the level of 1%, indicating that the samples in urban and rural areas are heterogeneous.

#### 5.3.2. Individual Characteristic: Marital Status

Bertocchi, Brunetti, and Torricelli (2011) study the effect of gender and marital status on financial investment and conclude that married people are more likely to invest in risky assets than single people, and suggest that marriage can be considered as a safe asset. Therefore, this paper further divides the whole sample into “married” and “other” groups according to their marital status.

Table 8. Urban-rural dual differences in the impact of household entrepreneurial input on risky financial investment.

Different residence	Holding risky financial assets			
	Rural		Urban	
Two types of regressions	Marginal effect	Coefficient	Marginal effect	Coefficient
Proportion of household entrepreneurial investment	0.011 (0.014)	0.389 (0.430)	-0.182*** (0.038)	-0.840*** (0.166)
Control variables	Controlled	Controlled	Controlled	Controlled
Obs., N	4028	4028	8887	8887
Regional effect	Controlled	Controlled	Controlled	Controlled
Pseudo R <sup>2</sup>	0.198	0.198	0.242	0.242
P-values for the test of differences in coefficients between groups	0.014			

Note: The table reports the average marginal effect; Clustered robust standard errors in parentheses; \*\*\* denote 1% significance level.

As shown in Table 9 both groups have a significant crowding-out effect on risky financial market participation and inputs at the 1% level, but models (1) and (2) fail the SUEST test, indicating that there is no significant difference between the coefficients of the two groups. The reason for this result may be that the sample size is not extensive, but we can still observe a significant crowding out effect of entrepreneurial households on risky financial asset allocation regardless of marital status.

### 5.3.3. Behavioral Choice: Trust Degree

The degree of trust in others also affects individuals' choice of risk capital. Yin, Pan, and Yang (2022) pointed out that the "relatively trusting" household sample is the most likely to participate in the investment risky financial market, while the "very trusting" household sample is not willing to invest.

In order to study whether there is heterogeneity among families with different levels of trust, this paper divides respondents into trust group and distrust group according to their self-perceived trust degree. The main regression results are shown in Table 10. It shows that the entrepreneurial input of the two groups of households significantly crowds out the participation rate and degree of the corresponding households in the risky financial market at the confidence level of 1% or 5% respectively. For Model (1), the correlation coefficients of the two groups are proved to be significantly different, that is, the crowd out effect of the household samples in the trust group on holding risky financial assets is greater, which may be because the trust degree exceeds the moderate level, which is not conducive to the corresponding households' participation in risky financial market activities.

### 5.4. Robustness Tests

Since there are many choices in the measurement methods of variables, in order to verify the robustness of data, this paper conducts a robustness test on the model by replacing variables.

First of all, in terms of independent variables, referring to the setting method of Huang (2021), the response variable is replaced by the ratio of household entrepreneurial investment to total household assets to the ratio of household net assets. Through the Probit and Tobit models, the empirical results are presented in columns (1) and (2) of Table 11, showing that the corresponding results are consistent with the previous analysis.

Secondly, in terms of dependent variables, referring to the research process of Meng, Cao, and Zhang (2019) this paper changes the ratio of risky financial assets to total financial assets from the original to the ratio of household net assets, aiming at the measurement method of the core dependent variable of "the proportion of risky financial assets". The Tobit results reported in Column (3) of Table 11 show that household entrepreneurial input still has a significantly negative impact on venture financial investment, which is consistent with the previous empirical findings and the results are robust.

Table 9. Marital status differences in the impact of household entrepreneurial input on risky financial investment.

Different marital status	(1)				(2)			
	Holding risky financial assets				Proportion of risky financial assets			
	Married		Others		Married		Others	
	Marginal effect	Coefficient	Marginal effect	Coefficient	Marginal effect	Coefficient	Marginal effect	Coefficient
Proportion of household entrepreneurial investment	-0.108*** (0.031)	-0.674*** (0.168)	-0.146** (0.066)	-0.944** (0.417)	-0.055*** (0.014)	-0.379*** (0.085)	-0.106*** (0.031)	-0.825*** (0.256)
Control variables	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Obs., N	11208	11208	1777	1777	11208	11208	1777	1777
Regional effect	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Pseudo R <sup>2</sup>	0.317		0.289		0.319		0.313	
P-values for the test of differences in coefficients between groups	0.586				0.140			

Note: The table reports the average marginal effect; Clustered robust standard errors in parentheses; \*\* and \*\*\* denote 5% and 1% significance levels, respectively.

Table 10. Trust degree differences in the impact of household entrepreneurial input on risky financial investment.

Different trust degree	(1)				(2)			
	Holding risky financial assets				Proportion of risky financial assets			
	Trust		Distrust		Trust		Distrust	
	Marginal effect	Coefficient	Marginal effect	Coefficient	Marginal effect	Coefficient	Marginal effect	Coefficient
Proportion of household entrepreneurial investment	-0.316*** (0.111)	-1.670*** (0.636)	-0.064** (0.031)	-0.508** (0.217)	-0.128*** (0.040)	-0.737*** (0.273)	-0.062*** (0.014)	-0.508*** (0.133)
Control variables	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Obs., N	767		8262		767		8262	
Regional effect	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Pseudo R <sup>2</sup>	0.333		0.329		0.358		0.323	
P-values for the test of differences in coefficients between groups	0.062				0.381			

Note: The table reports the average marginal effect; Clustered robust standard errors in parentheses; \*\* and \*\*\* denote 5% and 1% significance levels, respectively.

Table 11. Robustness tests.

Three forms of regressions	(1)	(2)	(3)
	Holding risky financial assets	Proportion of risky financial assets	Proportion of risky financial assets (net assets)
Proportion of household entrepreneurial investment (net assets)	-0.087*** (0.024)	-0.060*** (0.012)	
Proportion of household entrepreneurial investment			-0.024*** (0.004)
Control variables	Controlled	Controlled	Controlled
Obs., N	12985	12985	12985
Regional effect	Controlled	Controlled	Controlled
Pseudo R <sup>2</sup>	0.311	0.315	0.490

Note: The table reports the average marginal effect; Clustered robust standard errors in parentheses; and \*\*\* denote 1% significance levels, respectively.

In addition, in order to measure the profound impact of the depth of entrepreneurial participation on household participation in the risky financial market, this paper selects a one-period lagged household entrepreneurial input share, i.e., data related to the 2015 China Household Finance Survey, to examine the effect of regression estimation. Through basic data cleaning and matching, this paper finally obtains 8434 households, and the main regression results are shown in Table 12. It can be seen that the depth of household entrepreneurial participation in the lagged period still have a significant crowding-out effect on their investment in the risky financial market: the average marginal effect of relevant households on holding risky financial assets is  $-0.160$ , and the average marginal effect of relevant households on investment in risky financial assets is  $-0.067$ , both of which are significantly negative at the 1% level, verifying the robustness of the original model. Therefore, the depth of entrepreneurial participation in the lagged one period still has a significant crowding-out effect on the risky financial investment of the corresponding households in 2017, and the financial investment in entrepreneurial activities should take into account the future liquidity needs of households, which has a profound impact on future risky investment behavior.

## 6. CONCLUSIONS AND POLICY RECOMMENDATIONS

This paper mainly relies on the 2017 CHFS data and refers to previous academic results, uses the Probit and Tobit models to empirically analyze the depth of household entrepreneurial involvement and risky financial asset allocation. The main findings of this paper are as follows: firstly, the entrepreneurial participation depth of entrepreneurs has a significant negative impact on whether their households participate in risky financial investments; secondly, the more assets are invested in entrepreneurship, the less households invest in the risky financial market, exacerbating the already existing limited participation problem; in addition, the depth of entrepreneurial participation can be based on the need to diversify risk and satisfy liquidity, thus further crowding out participation in risky financial markets; finally, the crowding out effect of entrepreneurial inputs on household participation in risky financial markets has an urban-rural dichotomy and differences in trust levels.

Table 12. Probit and Tobit estimates: the impact of the depth of household entrepreneurial participation in 2015 on risky financial investment in 2017.

Two forms of regressions	(1)	(2)
	Holding risky financial assets (2017)	Proportion of risky financial assets (2017)
Proportion of household investment in Entrepreneurship in 2015	-0.160*** (0.061)	-0.067*** (0.026)
Control variables	Controlled	Controlled
Obs., N	8434	8434
Regional effect	Controlled	Controlled
Pseudo R <sup>2</sup>	0.334	0.342

Note: The table reports the average marginal effect; Clustered robust standard errors in parentheses; \*\*\* denote 1% significance level.

Based on the current economic and social development, according to the research results of this paper, the author considers the following policy suggestions from the two aspects of entrepreneurship and risky financial market:

First, in terms of entrepreneurship, we should continue to promote the implementation of the “mass entrepreneurship and innovation” reform in China to stimulate the vitality of entrepreneurial families.

In terms of economic policy, we should provide entrepreneurs with certain preferential tax and fee reduction, expand financing channels for small and micro enterprises, and reduce the difficulties caused by credit constraints or liquidity risks to entrepreneurial households to weaken the risk substitution effect on risky financial assets. In terms of social development, it is necessary to further strengthen entrepreneurship education and guidance, promote the popularization of financial and economic knowledge, to improve residents’ financial literacy and enhance their correct cognition of entrepreneurial activities. In terms of environmental construction, it is necessary to strengthen the investment in science and technology and infrastructure construction, vigorously encourage rural entrepreneurial activities, reduce information barriers, and enhance the availability and popularization of finance in rural areas.

Second, in terms of venture financial investment, we should constantly improve modern financial supervision and promote the pace of high-quality economic development.

On the one hand, based on the objective reality of limited participation in the risky financial market, the financial market should give sufficient confidence to the participants, strengthen the supervision of the financial system, and ensure the healthy operation of the capital market. On the other hand, the financial market could provide entrepreneurs with personalized and professional financial products that are more in line with their investment needs, enrich the risk capital choices of entrepreneurial families, as to slow down the crowding out of entrepreneurial investment in their risky financial asset allocation. Thus, we can promote the scientific allocation of household assets and their effective participation in the risky financial market, and further promote the sustainable development of the capital market.

**Funding:** This study received no specific financial support.

**Institutional Review Board Statement:** Not applicable.

**Data Availability Statement:** The corresponding author can provide the supporting data of this study upon a reasonable request. The original data supporting the findings of this study are openly available in Survey and Research Center for China Household Finance at <https://chfser.swufe.edu.cn/datas/>.

**Competing Interests:** The authors declare that they have no competing interests.

**Authors’ Contributions:** Conceptualization, writing, methodology, formal analysis, review & editing, L.Z.; methodology design, formal analysis, writing – review & editing, W.Z.; conceptualization, writing – original draft, methodology design., I.G.W.S.A. All authors have read and agreed to the published version of the manuscript.

## REFERENCES

- Albrecht, P., Kapounek, S., & Kučerová, Z. (2022). Economic policy uncertainty and stock markets’ comovements. *International Journal of Finance & Economics*, 1, 1-17. <https://doi.org/10.1002/ijfe.2603>
- Alvarez-Sousa, A. (2019). Entrepreneurs by necessity. Determining factors. *Reis: Spanish Journal of Sociological Research*, 166, 3-24. <http://dx.doi.org/10.5477/cis/reis.166.3>
- Andersson, M., & Noseleit, F. (2011). Start-ups and employment dynamics within and across sectors. *Small Business Economics*, 36(4), 461-483. <https://doi.org/10.1007/s11187-009-9252-0>
- Angrisani, M., Atella, V., & Brunetti, M. (2018). Public health insurance and household portfolio choices: Unravelling financial “side effects” of medicare. *Journal of Banking & Finance*, 93, 198-212. <https://doi.org/10.1016/j.jbankfin.2018.05.001>
- Atella, V., Brunetti, M., & Maestas, N. (2012). Household portfolio choices, health status and health care systems: A cross-country analysis based on SHARE. *Journal of Banking & Finance*, 36(5), 1320-1335. <https://doi.org/10.1016/j.jbankfin.2011.11.025>

- Atems, B., & Shand, G. (2018). An empirical analysis of the relationship between entrepreneurship and income inequality. *Small Business Economics*, 51(4), 905-922. <https://doi.org/10.1007/s11187-017-9984-1>
- Berglann, H., Moen, E. R., Røed, K., & Skogstrøm, J. F. (2011). Entrepreneurship: Origins and returns. *Labour Economics*, 18(2), 180-193. <https://doi.org/10.1016/j.labeco.2010.10.002>
- Bertocchi, G., Brunetti, M., & Torricelli, C. (2011). Marriage and other risky assets: A portfolio approach. *Journal of Banking & Finance*, 35(11), 2902-2915. <https://doi.org/10.1016/j.jbankfin.2011.03.019>
- Brachert, M., Hyll, W., & Titze, M. (2017). On the simultaneity bias in the relationship between risk attitudes, entry into entrepreneurship and entrepreneurial survival. *Applied Economics Letters*, 24(7), 477-480. <https://doi.org/10.1080/13504851.2016.1203056>
- Bruton, G. D., Ketchen Jr, D. J., & Ireland, R. D. (2013). Entrepreneurship as a solution to poverty. *Journal of Business Venturing*, 28(6), 683-689.
- Campbell, J. (2006). Household finance. *Journal of Finance*, 61(4), 1553-1604.
- Carter, S., Kuhl, A., Marlow, S., & Mwaura, S. (2017). Households as a site of entrepreneurial activity. *Foundations and Trends in Entrepreneurship*, 13(2), 81-190.
- Cocco, J. F., Gomes, F. J., & Maenhout, P. J. (2005). Consumption and portfolio choice over the life cycle. *The Review of Financial Studies*, 18(2), 491-533. <https://doi.org/10.1093/rfs/hhi017>
- Dierkes, M., Klos, A., & Langer, T. (2011). A note on representativeness and household finance. *Economics Letters*, 113(1), 62-64. <https://doi.org/10.1016/j.econlet.2011.05.045>
- Dimmock, S. G., & Kouwenberg, R. (2010). Loss-aversion and household portfolio choice. *Journal of Empirical Finance*, 17(3), 441-459. <https://doi.org/10.1016/j.jempfin.2009.11.005>
- Doan, K. (2021). The relationship between entrepreneurship and national competitiveness. *Annals of the University of Oradea, Economic Science Series*, 30(2), 65-76.
- Ehrlich, I., Hamlen Jr, W. A., & Yin, Y. (2008). Asset management, human capital, and the market for risky assets. *Journal of Human Capital*, 2(3), 217-261. <https://doi.org/10.1086/593051>
- Faig, M., & Shum, P. (2002). Portfolio choice in the presence of personal illiquid projects. *The Journal of Finance*, 57(1), 303-328. <https://doi.org/10.1111/1540-6261.00423>
- Feng, Z. (2019). *The influence of family background risk on the financial risk assets allocation—based on empirical analysis of data from CHFS*. Master's Thesis. University of Electronic Science and Technology of China.
- Gentry, W. M., & Hubbard, R. G. (2004). Entrepreneurship and household saving. *The BE Journal of Economic Analysis & Policy*, 4(1), 1-57. <https://doi.org/10.2202/1538-0637.1053>
- Ghahreman, Y. (2016). *Essays in entrepreneurship and household finance*. Washington University in St. Louis, Arts & Sciences Electronic Theses and Dissertations. Retrieved from [https://openscholarship.wustl.edu/art\\_sci\\_etds/987](https://openscholarship.wustl.edu/art_sci_etds/987)
- Gogolin, F., Dowling, M., & Cummins, M. (2017). Individual values and household finances. *Applied Economics*, 49(35), 3560-3578. <https://doi.org/10.1080/00036846.2016.1262528>
- Gomes, F., Haliassos, M., & Ramadorai, T. (2021). Household finance. *Journal of Economic Literature*, 59(3), 919-1000.
- Guiso, L., Jappelli, T., & Terlizzese, D. (1996). Income risk, borrowing constraints, and portfolio choice. *The American Economic Review*, 86(1), 158-172.
- Haliassos, M., & Bertaut, C. C. (1995). Why do so few hold stocks? *The Economic Journal*, 105(432), 1110-1129. <https://doi.org/10.2307/2235407>
- Heaton, J., & Lucas, D. (2000). Portfolio choice and asset prices: The importance of entrepreneurial risk. *The Journal of Finance*, 55(3), 1163-1198. <https://doi.org/10.1111/0022-1082.00244>
- Huang, H. (2021). *Entrepreneurship and household investment on risky financial*. Master's Thesis. Guangdong University of Foreign Studies.
- Hull, D. L., Bosley, J. J., & Udell, G. G. (1980). Renewing the hunt for the heffalump: Identifying potential entrepreneurs by personality characteristics. *Journal of Small Business Management*, 18(000001), 11-18.

- Khyareh, M. M., & Rostami, N. (2018). Competitiveness and entrepreneurship, and their effects on economic growth. *International Journal of Management, Accounting & Economics*, 5(10), 833-848.
- Kim, G., & Cho, J. (2009). Entry dynamics of self-employment in South Korea. *Entrepreneurship and Regional Development*, 21(3), 303-323. <https://doi.org/10.1080/08985620802332707>
- Le Blanc, D., & Lagarenne, C. (2004). Owner-occupied housing and the composition of the household portfolio: The case of France. *The Journal of Real Estate Finance and Economics*, 29(3), 259-275. <https://doi.org/10.1023/b:real.0000036673.64928.7f>
- Liu, Y., Wang, W., Cong, Z., & Chen, Z. (2022). Effect of older adults in the family on the sandwich generation's pursuit of entrepreneurship: Evidence from China. *Ageing & Society*, 42(2), 331-350. <https://doi.org/10.1017/s0144686x21001033>
- Mandal, B., & Brady, M. P. (2020). The roles of gender and marital status on risky asset allocation decisions. *Journal of Consumer Affairs*, 54(1), 177-197. <https://doi.org/10.1111/joca.12261>
- Mankiw, N. G., & Zeldes, S. P. (1991). The consumption of stockholders and nonstockholders. *Journal of Financial Economics*, 29(1), 97-112. [https://doi.org/10.1016/0304-405x\(91\)90015-c](https://doi.org/10.1016/0304-405x(91)90015-c)
- Meng, M., Cao, X., & Zhang, X. (2019). Does the special economic zones policy affect industrial agglomeration in China: Based on the agglomeration perspective of the cross administrative boundary. *China Industrial Economics*, 11, 79-97.
- Moon, S., & DaeRyong, K. (2021). The dynamic relation between economic policy uncertainty and stock market volatility in two countries: United States and S. Korea. *Global Journal of Accounting & Finance* 5(2), 34-45.
- Ni, Y. (2020). Household wealth and entrepreneurial behaviour—analysis based on CHFS data. *Journal of Shanxi University of Finance and Economics*, 42(9), 31-43.
- Paulson, A. L., & Townsend, R. (2004). Entrepreneurship and financial constraints in Thailand. *Journal of Corporate Finance*, 10(2), 229-262. [https://doi.org/10.1016/s0929-1199\(03\)00056-7](https://doi.org/10.1016/s0929-1199(03)00056-7)
- Peprah, A. A., & Adekoya, A. F. (2020). Entrepreneurship and economic growth in developing countries: Evidence from Africa. *Business Strategy & Development*, 3(3), 388-394. <https://doi.org/10.1002/bsd2.104>
- Pratt, J. W., & Zeckhauser, R. J. (1987). Proper risk aversion. *Econometrica*, 55(1), 143-154.
- Shum, P., & Faig, M. (2006). What explains household stock holdings? *Journal of Banking & Finance*, 30(9), 2579-2597. <https://doi.org/10.1016/j.jbankfin.2005.11.006>
- The People's Bank of China. (2018). *China regional financial operation report*. Retrieved from <http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/3564228/2018062221381937583.pdf>
- Thomas, N. (2021). The impact of entrepreneurship on economic, social and environmental welfare and its determinants: A systematic review. *Management Review Quarterly*, 71(3), 553-584. <https://doi.org/10.1007/s11301-020-00193-7>
- Vatavu, S., Dogaru, M., Moldovan, N.-C., & Lobont, O. (2022). The impact of entrepreneurship on economic development through government policies and citizens' attitudes. *Economic Research*, 35(1), 1604-1617. <https://doi.org/10.1080/1331677x.2021.1985566>
- Vissing-Jorgensen, A. (2002). *Towards an explanation of household portfolio choice heterogeneity: Nonfinancial income and participation cost structures*. NBER Working Paper, No. w8884.
- Xiao, Z., Huang, Y., Chen, Z., & Lin, L. (2018). The effects of innovation environment on asset allocation of rural household in the City. *Economic Review*, 213(05), 148-159.
- Yang, B., Mao, Q., & Yi, X. (2021). Can entrepreneurship significantly increase household consumption?—micro evidence derived from China household finance survey. *Philosophy and Social Sciences*, 45(6), 32-45.
- Yi, X., Zhou, C., & Yang, B. (2016). Study on the effect of number of siblings of household head on household stock investment behavior: An analysis from household survey data in China. *Review of Investment Studies*, 35(12), 48-64.
- Yin, Z., Gong, X., & Guo, P. (2019). The impact of mobile payment on entrepreneurship—micro evidence from China household finance survey. *China India Economic*, 3, 119-137.
- Yin, Z., Pan, B., & Yang, H. (2022). Trust and Chinese family asset choice. *Fujian Tribune*, 357(2), 38-58.

- Yin, Z., Song, Q., & Wu, Y. (2014). Financial literacy, trading experience and household portfolio choice. *Economic Research Journal*, 49(4), 62-75.
- Yin, Z., Song, Q., Wu, Y., & Peng, C. (2015). Financial knowledge, entrepreneurial decision-making and entrepreneurial motivation. *Journal of Management World*, 1, 87-98.
- Yin, Z., & Zhang, C. (2019). The influence of married women's labor force participation on the household savings rate in China. *Economic Research Journal*, 54(4), 165-181.
- Zhou, C. (2020). Review of household risky financial market limited participation puzzle. *Review of Investment Studies*, 39(6), 99-110.
- Zhou, S., Jin, X., Fu, L., & Li, T. (2020). Residents' entrepreneurial behaviour from the perspective of happiness economics: Evidence from China. *The Journal of World Economy*, 43(3), 26-45.

*Views and opinions expressed in this article are the views and opinions of the author(s), The Economics and Finance Letters shall not be responsible or answerable for any loss, damage or liability etc. caused in relation to/arising out of the use of the content.*