The Relationship between Credit Constraints and Household Risky Assets

The Case of China
Abstract

The purpose of this empirical research is to evaluate the relationship between credit constraints and household risky assets in China. The life-cycle hypothesis theory and household portfolio choice theory is the basis of the research. Using a probit model, we find out that credit constraints do not have a clear impact on the probability of households to hold risky assets. Furthermore, the coefficients between age and risky assets are non-linear. Households in urban regions have a high positive coefficient with risky assets. As for now, the literature is missing theories on the relationship between credit constraints and household financial risky assets in China. Thus, this study will enrich the literature of household financial assets allocation by using a questionnaire survey from CHFS (China Household Finance Survey).
# Table of Contents

1. **Introduction** .................................................................................. 1  
   1.1 Purpose ......................................................................................... 3  
   1.2 Contribution ............................................................................... 4  

2. **Theory and Literature Review** ...................................................... 4  
   2.1 Life-cycle Hypothesis Theory ...................................................... 4  
   2.2 Household Portfolio Choice Theory ............................................ 5  
   2.3 Credit Constraints ..................................................................... 6  
   2.4 Household Risky Assets ............................................................ 7  

3. **Research Hypothesis** ................................................................... 9  

4. **Method** ...................................................................................... 10  
   4.1 Data Resource ........................................................................... 10  
   4.2 Probit Model ............................................................................. 10  
   4.3 Variable Description .................................................................. 11  
   4.3.1 The Dependent Variables ...................................................... 11  
   4.3.2 The Independent Variables .................................................... 12  

5. **An Empirical Analysis in Household Finance** ......................... 14  

6. **Conclusion** ............................................................................... 17  
   6.1 Credit Constraints ...................................................................... 17  
   6.2 Age ............................................................................................. 18  
   6.3 Urban Households ...................................................................... 19  

**Reference** ..................................................................................... 20
Figures
Figure 1 Annual Per Capita Income of Households in Rural Regions in China......... 2
Figure 2 Annual Per Capita Income of Households in Urban Regions in China .......... 3

Tables
Table 1 Questions in the Questionnaire and Variable Descriptions ...................... 11
Table 2 Statistical Description of Variables .................................................. 14
Table 3 Probit Regression Statistics ............................................................ 15
1. Introduction

Over the past 25 years, the growth of the Chinese economy has been remarkable. Real per capita GDP rose from 1,516 USD in 1990 to 12,608 USD in 2014; which amounted to over 9 percent of the average annual growth rate (Wu et al., 2017). With the substantial increase in GDP and residents' income in China, the scale of the Chinese financial market is promoted and developed significantly. As a result of growth in disposable income and different varieties of financial capitals in the market, Chinese households start to change their asset structure to maximize their welfare and satisfy various investment goals (Zhang, 2017). Therefore, the study of household assets is gaining more attention.

From a research perspective, factors like mortgages, consumer credit, income insurance and credit card debts have already altered the way of citizens' consumption and savings. Households will face a situation called credit constraints when using these financial tools. (Crook & Hochguertel, 2007) Credit constraints are often only considered as a household consumption factor in the theoretical and empirical analysis (Lehnert, 2004). The uncertainty of the household is increased, thus, the more credit constraints of a family, the greater probability that they are unable to smooth the consumption (Feder, Just, & Zilberman, 1985). At this moment, the household tends to increase savings and inhibit consumption. The structure of financial assets held by households reflects the difference in the asset portfolio, and the difference in risk and benefit from different portfolios can affect the credit constraints of the family (Dearden et al., 2004). Credit constrained households differ from those who are not. Most of the time poor people are often credit constrained, and it is most likely that this is not going to change. (Barham, Boucher & Carter, 1996). If the household's short term income is subject to fluctuations, they need to complete the consumption allocation through credits, even though credit constraints is hindering their behaviour.

In this paper, we are doing research on the investment and asset allocation aspects along with the relationship of credit constraints and household risky assets. Studying the allocation of household risky assets is of high importance, since is not only useful to understand the size and structure of the risky assets but also to guide the household
investors through the proper optimisation of their assets (Levy & Hennessy, 2007) and enhance the ability to resist risks.

Furthermore, we choose to analyse the credit constraints due to the huge income gap of urban and rural regions in China. With the further development of China's economy, the income level of rural residents predicts rapid growth and an accompanying increase in consumption levels (Ding et al., 2017). Among many socio-economic problems faced by the Chinese government, the urban-rural gap is one of the main bottlenecks in economic growth (Peng & Li, 2006). Thus, the study between urban and rural regions can provide practical suggestions for the establishment of the credit market in China. Credit constraints are affecting the extent of the financial household market (Linneman & Wachter, 1989), and are linking the financial investment market and the credit market together to support a comprehensive macroeconomic analysis (Deininger & Squire, 1998).

The figures below show the percentage difference of the average annual per capita income, between families in rural and urban regions in China.

Figure 1  Annual Per Capita Income of Households in Rural Regions in China

Source: Adapted from China Statistical Yearbook (2015)
Normally, a rural area is defined by population density. However, in China, 'rural' is defined by the state of permanent residence and the administrative system (Liu, Nijkamp & Lin, 2017). From these two figures, we can observe that no clear boundary between urban and rural regions in China exists. While green areas demonstrate the percentage above the average of the whole country, the areas in red label the percentage below. The income gets higher with deeper green colour. Figure 1 and 2 show that regions in the east have a higher income than other regions and it is the lowest in the northwest. The income gap is significantly large in whole China, no matter if it is urban or rural regions.

1.1 Purpose

The purpose of the empirical research is to elaborate the relationship between credit constraints and household risky assets in China. We summarised the literature regarding credit constraints of Chinese households and working with data as of 2011 amassed by the China Household Finance Survey, used with permission. Next to several demographic controls, we look for roles of credit constraints and household risky assets. The comparative abundance of the data allows us to produce multiple alternative measures of many factors, promoting a specific and careful analysis of regression relationships.
1.2 Contribution

In China, there is little research on the analysis between credit constraints and household risky assets. In the past, credit constraints are often used in the field of household consumption behaviour only (Jappelli, 1990), and do not apply to the household asset allocation research. However, credit constraints break through the limitations of the traditional perspective and link the credit market and financial investment market together. Developments in the credit and financial market, funds financing and financial asset allocation is directing the economic situation for many households. On the other hand, China’s urban-rural structure is apparent, and the concepts differ from the knowledge of other countries' situations. They are all distinct from the previous study. Furthermore, to find problem solutions for income inequality (Peng& Li, 2006), we choose to further understand the relationship between credit constraints and household risky assets in various families.

2. Theory and Literature Review

2.1 Life-cycle Hypothesis Theory

Household assets selection mainly studies the determinants of the types of assets and asset allocation. The family faces two decisions: how to allocate between consumption and savings, and the proportion of the distribution of risky assets in financial assets. Modigliani’s (1964) life cycle theory indicates that families who choose different asset allocation on the condition of present and expected income do so to smoothen the consumption. The life-cycle model is the principal idea in the current theory of saving.

The life-cycle hypothesis theory suggests three periods for households to flatten the spending over the life-cycle. In the early stage, they borrow the debts at the time their earnings are low. The middle stage is paying off debt and accumulating savings. When their income increases, and they start spending during later stages (Zhao et al., 2006). The central idea of the theory of life-cycle is getting into debt for the times with lower income and paying off the debt during times of higher income.

Several literature reviews show evidence that the asset allocation exists in life-cycle theory. Consumers with credit constraints are prone to overspending and fall into financial
problems. Moreover, a household which is overextended during the middle and later live stages may never accumulate wealth when they are older (Lyons & Yilmazer, 2004). This result will enlarge their constraints in credit. Haliassos and Michaelides (2003) establish a life-cycle model by analysing the household portfolio choice for consumers between risky and non-risky assets with the result that households can achieve desired consumption smoothing when owning small or zero holdings of stock. Guiso et al. (2000) find out that the credit constraints largely affect young households. They typically have a small ratio of accumulated wealth of future earnings and optimally borrow money for consumption. Faced with borrowing constraints, they tend to either hold small numbers of assets or none at all. The natural desire of young households to own a house will influence their financial portfolio allocation, which is entirely antithetical to older households. Elder people who are moving from larger to smaller houses or moving in with their children face the question of allocating their liquid funds, including the proceeds from of the house sale, among alternative financial assets. Taken together, these results suggest that we pay attention to the factors like, age, housing, savings.

2.2 Household Portfolio Choice Theory

Many factors affect the way that households allocate their assets. Understanding household's asset allocation is essential for analysing the behaviour of their investment choices. Although there is little empirical research on asset allocation, the household portfolio choice theory mainly analyses the determinant of household asset allocation.

The household portfolio choice together with the theoretical analysis is mostly related to choosing between risk-free and risky assets. Original portfolio theory mainly focuses on understanding financial portfolio selection, with the shortage of concentration on the other components of household wealth. Markowitz (1952) describes the earliest portfolio theory with the mean-variance analysis. In that model, the consumer is making investment decisions by evaluating the expected return of investment and the risk of restitution of assets. Tobin (1958) finds that risky assets consist of different proportions of a household portfolio. It further proposes that investors with more risk adverse attitude would occupy a greater percentage of their portfolio to combine the risky assets.
Nevertheless, recent analyses turn to concern the real estates on the household's financial assets allocation. Bodie, Merton, and Samuelson (1992), explore the condition of an individual's optimal investment and consumption choices in a life-cycle model and notice that the wealth combination of the individual affects his optimal portfolio choice.

However, few writers have been able to draw on any systematic research into the influence of risky assets in household asset allocation because they only focus on family's financial wealth. Moreover, most of the empirical analysis have only been carried out in a small number of areas. Researchers have not treated the importance of risky assets in household portfolio choice in much detail.

2.3 Credit Constraints

Recently, many researchers noticed that constraints not only occur from the credit ratio of the bank, but also from the cognitive bias of borrowers. Baydas, Meyer and Aguilera (1994), suggest that some borrower would give up trying to get a loan because of the high ratio of loan rejection. This situation can be observed in companies as well. Research by Kon and Storey (2003) finds evidence that even though some firms have the ability to pay back their debts they choose not to apply for loans as they are afraid to be refused.

Rui and Xi (2010) discover that the credit constraints have significant adverse effects on the income and consumption of rural households. Furthermore, Chivakul & Chen (2008) describe main factors such as age, income, wealth and education qualifications, which give us the direction of the factors included in credit constraints of our research. Moreover, Kumar, Turvey and Kropp (2013) find out that credit constraints affect the aspect of consumption of food and achievements in education and health in a negative way. Additionally, credit constraints are more heterogeneous across geographic regions (Le Blanc et al., 2014).

Gan & Hu (2016) suggest that credit constraints negatively impact on household's consumption, based on the results of regression model. Households with credit constraints have fewer assets and less income (Jappelli, 1990). Hai and Heckman (2016) find the
evidence that substantial life cycle credit constraints can influence human capital accumulation and inequality.

Within literature on the urban and rural regions in China, Zhao & Barry (2014) discover that rural households in China suffer not only from the supply but also from the demand perspective, which is due to the transaction costs and risk rationing. A sample survey on rural households in Chengdu province in China, shows that families in rural areas are faced with both credit supply rationing and demand constraints (Zhu & Ming, 2011). Li, Lin & Gan (2016) also discover that relaxing credit constraints have a positive effect on households' consumption expenditures based on the investigation of the Jiangxi province in South China.

From the literature review, we can figure out that the characteristics of households in rural areas are significant in China. However, urban families can be affected by credit constraints when making the decision of assets' allocation as well.

2.4 Household Risky Assets

As this article is determined to investigate the relationship between credit constraints and household risky assets on different families, it is necessary to establish the categories of household financial assets. Jawad (2014) adopts the approach of Guiso, Jappelli, and Terlizzarese (1996), by defining both narrow and broad risky asset definitions. In our case, risky assets include stocks, funds, bonds, derivatives, financial products, non-rmb assets, and gold; while risky-free assets comprise demand deposits, time deposits, treasury bills, local government bonds, cash in stock accounts, and cash holding.

For the unit of a household, a household does not completely fit the portfolio theory in the allocation of the asset, varying from different classes (Campbell, 2006). From the conception by Campbell, Chan & Viceira (2003), the demand for risky assets has an active function on risk tolerance. Chiappori & Paiella (2011) find that as wealth accumulates, the household turns a greater portion of its financial assets into more risky assets. Brunnermeier and Nagel (2008) also make descriptions that the change of risky assets causes shifts in both property and the share of risky assets in total household assets.

1 'rmb' is the official currency of China.
Compared to the household assets choice theory based on the investors, we have considered various risky asset factors in the literature of the research on the household financial asset.

Angerer & Lam (2009) regard that perpetual income risk decreases the percentage of risky assets in the household's financial assets, however temporary income risk does not. This outcome provides strong indication that households' portfolio choices relate to labour income risks apparently consistent with economic theory. Through the result, employees' income is one of the factors affecting households' choice.

In the simulation model of Flavin and Yamashita (2002) the proportion of risky assets in total property is higher for young households who just bought a house than for older households who are close to retirement. Lupton (2003) discovers a negative relationship between the level of consumption and present risky asset owning, involving real estate. Kong (2012) concludes that retirement has a positive effect on risky asset shares for house owners while it has no effect on people without a house. Therefore, being a house owner or not is relevant for the factors of credit constraints.

Cardak & Wilkins (2009) are illustrating that the commercial awareness and knowledge play a significant role in holding the risky assets. Holding of risky asset is related to the home-ownership and constraint. They explained both on the level of education and the right of control in a family, the latter may relate to the size of a family.
3. Research Hypothesis

Based on previous studies, the following hypothesis can be made.

Hypothesis a:
Based on previous research, credit constraints will affect the selection of financial assets. When the family is facing credit constraints, their tolerance of risky asset is getting lower, therefore the probability of owning risky assets will decrease. Such families are usually more likely to own financial assets with low risks, such as government bonds instead of risky assets like stock, Hypothesis a can be expressed as followed:

\( H_{0a} \): Credit constraints do not have a negative correlation with owning risky assets.
\( H_{1a} \): Credit constraints have a negative correlation with owning risky assets.

Hypothesis b:
Based on the life-cycle theory, the asset allocation will change during one's lifetime. At the beginning of the career, a person is most likely to do business or invest in real estates while having money constraints. It is very likely for them to borrow from the bank, and pay it back after they save money. Based on the previous research, those households who are not facing credit constraints are more likely to invest in risky assets. With increasing age, the wealth will accumulate, which will decrease the likelihood of credit constraints. Hypothesis b can be expressed as followed:

\( H_{0b} \): Age does not have a non-linear correlation with risky assets.
\( H_{1b} \): Age has a non-linear correlation with risky assets.

Hypothesis c:
Those shreds of evidence from previous pieces of literature highlight the credit constraints problem in rural China, and it will restrict the allocation of households' assets. Hypothesis c can be expressed as followed:

\( H_{0c} \): Households in urban regions do not have a positive correlation with risky assets.
\( H_{1c} \): Households in urban regions have a positive correlation with risky assets.
4. Method

4.1 Data Resource

This paper uses retrieved data from the CHFS which was published during 2013 to 2014 and obtained from Southwest University of Finance and Economics in China. Its primary purpose is to carry out the CHFS, to establish a nationally representative household-level commercial database.

The sample data covers comprehensive household financial micro-data such as demographic characteristics and work, production and operation and housing assets, financial assets and household liabilities, income and expenditure, insurance and security, and household wealth. The data is based on 25 provinces and autonomous regions (except Xinjiang, Tibet, Inner Mongolia). With the population size sampling method, each community was using the map address method to draw the residential distribution map, and furthermore randomly selected 20 to 50 households, using Computer Assisted Personal Interview (CAPI) for home access. The CHFS sampled in total 8,438 families in 2011.

4.2 Probit Model

A probit model is a discrete choice model in which the population regression function is based on the cumulative normal distribution function. It is a traditional specification for a binary response model (Gujarati & Porter, 2009).

Theoretically, the model can be explained by the linear probability model as following:

\[ I_i = \beta_1 + \beta_2 X_i + e_i \]

where "I," is a binary dependent variable and "X," is an explanatory variable (that may be quantitative or binary) and "e," is the residual. However, we cannot measure the net amount of net utility of “I,” and instead we do observe the discrete choice made by the individual:
\( Y_i = \begin{cases} 1, & \text{if } I_i > 0 \\ 0, & \text{if } I_i < 0 \end{cases} \)

In this study, the effect of credit constraints on risky household assets should be estimated, so the probit model is used as the empirical model to explain the dummy variable. The function is as follows:

\[
\text{Risky Asset}_i = \alpha \text{Credit Constraint}_i + \beta X_i + u_i
\]

"Risky Asset" means household participation in the risky market, including the decision to hold risky assets or not. "Credit Constraint" describes whether the household faces credit constraints or not. "X_i" stands for a control variable like age, education, marriage, income, gender. \( U \sim N (0, \sigma^2) \).

### 4.3 Variable Description

#### 4.3.1 The Dependent Variables

The dependent variable in the probit model is a dummy variable such as a family holding risky assets. We use “risky assets” to represent the management of household finance. It refers to whether a family is holding stock, bond, gold, fund, financial products, derivatives and non-rmb assets.

The variables are selected by the model and have the following meanings:

**Table 1** Questions in the Questionnaire and Variable Descriptions

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Variable Description</th>
<th>Questions in the questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risky Assets</td>
<td>Hold risky assets=1, otherwise=0.</td>
<td>Do you own bond, stock, derivatives, non-rmb assets, or gold?</td>
</tr>
<tr>
<td>Credit Constraints</td>
<td>the family has the credit constraints=1, otherwise=0</td>
<td>Why don't you have the credit? Not need=1, applied and was refused=2, need but not apply=3, have paid off the credit=4</td>
</tr>
<tr>
<td>Age</td>
<td>age=2011- birth year</td>
<td>Year of birth</td>
</tr>
<tr>
<td>Age_S</td>
<td>The square of age</td>
<td>None</td>
</tr>
<tr>
<td>Education</td>
<td>Education from 1-9</td>
<td>Never have education=1, primary=2, junior high school=3, high school=4, secondary or vocational level=5, college or vocational=6,</td>
</tr>
<tr>
<td>Gender</td>
<td>Male=1, Female=0</td>
<td>Gender: Male=1, Female=0</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Housing</td>
<td>Whether to have a house=1, otherwise=0</td>
<td>Whether to have a house=1, otherwise=0</td>
</tr>
<tr>
<td>Marital status:</td>
<td>Unmarried=1, Married=2, Cohabitation=3, Separation=4, Divorce=5, Widowed=6 (Set Married=2 as Married, or other situation as otherwise)</td>
<td></td>
</tr>
<tr>
<td>Log of Saving</td>
<td>Log of family's savings(rmb)</td>
<td>The number of family's savings(rmb)</td>
</tr>
<tr>
<td>Size</td>
<td>The size of the family from 1-11.</td>
<td>The number of household members</td>
</tr>
<tr>
<td>Urban Households</td>
<td>Urban=1, Rural=0</td>
<td>What is interviewee's registered permanent residence, urban or rural?</td>
</tr>
</tbody>
</table>

4.3.2 The Independent Variables

The main independent variable in our paper is credit constraints. Hayashi and Zeldes (1985) refer to the families own small deposit and low financial assets as households with credit constraint. Jappelli (1990) chooses statistics from Survey of Consumer Finance, to estimate the credit constraints. Families were asked about credit constraints with the possible answers "do not apply as worried about being rejected" and "application was rejected". This direct method considers both supply and demand. In follow-up studies. Therefore, this paper follows this direct method to identify the families with credit constraints. In the investigation of the CHFS, those who answered, "not have a loan" were defined as having credit constraints either because they did not apply for loans since they were afraid of being rejected or their applications actually have been rejected by banks.

For other independent variables, we have chosen the different characteristics of the household in the participation of consumer finance activities and external factors affecting the family. Independent variables include age, education, marriage, savings, and gender. Furthermore, age square is added to test whether the regression is linear or not when the coefficients – between age and risky assets – are either positive or negative. Besides, we log the income to have the regression closer to a normal distribution. The education level has a distinct influence on the holding of risky assets (Campbell, 2006). Young families are more
likely to hold risky assets and have credit constraints (Bodie, 1992). Campbell (2006) also discovers that females are more risk-adverse than males. Gender is strongly associated with the choice of the household portfolio. Zhong and Xiao (1995) conclude that the proportion of household assets allocated into risky portfolio increases with household income. Furthermore, we used the household registration as variable to measure the difference of risky assets choices between the rural and urban area in China.
5. An Empirical Analysis in Household Finance

We used the sample from the data of CHFS in 2011, with the unit of one household, and credit constraints as the main variable in the regression analysis. Further variables for the decision-maker of the family are the age, education level, gender, marital status, family's saving, family's scale and owned housing assets. After putting the information of 8,438 families together, households that did not answer the questionnaire were omitted from the dataset, yielding a total of 1,559 households for evaluation.

Table 2 Statistical Description of Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number of observations</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risky assets</td>
<td>1,559</td>
<td>0.088</td>
<td>0.284</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Credit constraints</td>
<td>1,559</td>
<td>0.179</td>
<td>0.139</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Age</td>
<td>1,559</td>
<td>48.398</td>
<td>0.020</td>
<td>16</td>
<td>93</td>
</tr>
<tr>
<td>Age square</td>
<td>1,559</td>
<td>2,530.367</td>
<td>0.000</td>
<td>256</td>
<td>8,649</td>
</tr>
<tr>
<td>Education</td>
<td>1,559</td>
<td>2.943</td>
<td>0.040</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Gender (Man)</td>
<td>1,559</td>
<td>0.618</td>
<td>0.103</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Housing</td>
<td>1,559</td>
<td>0.958</td>
<td>0.236</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Log of Income</td>
<td>1,559</td>
<td>0.905</td>
<td>0.029</td>
<td>0</td>
<td>5.311</td>
</tr>
<tr>
<td>Marriage (Married)</td>
<td>1,559</td>
<td>0.885</td>
<td>0.148</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Log of Saving</td>
<td>1,559</td>
<td>3.381</td>
<td>0.068</td>
<td>0</td>
<td>6.477</td>
</tr>
<tr>
<td>Size</td>
<td>1,559</td>
<td>3.995</td>
<td>0.032</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Urban</td>
<td>1,559</td>
<td>0.207</td>
<td>0.106</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

The table suggests that only a few families (8.85 percent) hold risky assets, and around 18 percent of the families face credit constraints. Furthermore, the average education level is relatively low, with most people only having the educational attainment of junior high school. The average age of the host of a family is around 48, with the youngest being 16 and the oldest being 93 years old. In 62 percent of the cases, the household's economic decision-maker is a man. Interestingly, more than 95 percent of families in China own a house. Moreover, around 89 percent of the family hosts is married. The average size of one
family is four people, and only around one fifth of the analysed families is living in urban areas.

The probit model has been used to estimate the influence of credit constraints to risky assets. The table below is the probit regression statistics.

Table 3 Probit Regression Statistics.

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Regression (Z-Statistics)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risky Assets</td>
<td></td>
</tr>
<tr>
<td>Credit Constraints</td>
<td>0.114 (0.819)</td>
</tr>
<tr>
<td>Age</td>
<td>-0.050** (-2.498)</td>
</tr>
<tr>
<td>Age square</td>
<td>0.001** (2.381)</td>
</tr>
<tr>
<td>Education</td>
<td>0.145*** (3.626)</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.251** (-2.446)</td>
</tr>
<tr>
<td>Housing</td>
<td>-0.030 (-0.126)</td>
</tr>
<tr>
<td>Income</td>
<td>-0.015 (-0.517)</td>
</tr>
<tr>
<td>Marriage</td>
<td>0.044 (0.297)</td>
</tr>
<tr>
<td>Saving</td>
<td>0.273*** (3.994)</td>
</tr>
<tr>
<td>Size</td>
<td>-0.019 (-0.577)</td>
</tr>
<tr>
<td>Urban households</td>
<td>0.599*** (5.624)</td>
</tr>
</tbody>
</table>

Note: ***, ** and * represent the significant level of 1%, 5%, 10%.

From the table, the outcome of credit constraint is statistically insignificant, so we cannot reject $H_0$, which means the impact on risky assets is not evident. Besides, we can see that both age and age square are statistically significant so that $H_0$ can be rejected. Age has a non-linear correlation with household risky assets. The results indicate that the relationship
between age and risky assets holding are inverted “U” shape. Teenagers first have to save money for investments, hence, the probability of investing risky assets will increase. However, when people come to an old age, they will normally be more risk-averse and are more likely to want a stable life, so the amount of risky assets will decrease. Overall, the consequence matches with the life-cycle theory which assumes the assets allocation will change during a person's life.

Education has a positive coefficient with holding risky assets with statistically significant results. Since people with a higher education level will find jobs more easily than those without an education, it leads to a better income and an increased likelihood to own risky assets as an investing method. At the same time, these people have more basic knowledge of the financial market and are more likely to invest instead of only depositing their money in the bank. However, owning a house does not have a noticeable impact on holding risky assets. The result is consistent with the previous statistical analysis between families with or without a housing asset (around 98 percent of the analysed households own a house). As almost all families having housing assets, there is no big influence to the risky assets holding.

Moreover, saving has a high statistically significant impact on holding risky assets, with positive coefficients. Proposed by the life-cycle theory, people will first borrow from the banks and repay the credit when they saved enough money after a period. With the increase in savings, people will change their allocation of assets and are more willing to hold the risky assets. Moreover, the family size has no visible impact on holding risky assets, since family's fortune does not depend on the size. Likewise, income and marriage do not have an apparent effect on holding risky assets either, as more than 80 percent of the analyse families are married. The analysis show that women are more likely to hold the risky assets than men. This conclusion is opposite to Campbell's (2006) opinion.

Finally, households in urban regions have a high statistically significance with household risky assets and a positive coefficient, wherefore H₀ cannot be rejected. Hence, people living in urban areas are more likely to hold the risky assets, as they are comparatively wealthier than people living in rural areas. Urban areas, offer people more complete utilities and better education. This is why they are more likely to have better jobs and human resources, which is leading to a higher income.
6. Conclusion

From the empirical analysis, we know that age, education, gender, savings and urban households have significant impacts on holding risky assets, while the other included variables do not show obvious influence. In the following, we analyse the reason of three variables out of the previous hypothesis.

6.1 Credit Constraints

This thesis is mainly taken from the angle of credit constraints to explain the choice of household risky assets in China; empirical investigating the influence of credit constraints to the household risky assets allocation. The outcomes demonstrate that households who are facing the credit constraints have no apparent influence of risky assets.

Families with credit constraints are, firstly, those who were rejected by a bank when they applied for the loan. Secondly, families who did not apply for a loan since they were afraid of being dismissed for not having any real estates as a mortgage. Banks are evaluating one's entire fortune and many other factors when they receive the loan applications and instinctively avoid risks. Households with credit constraints do not only have enough power to pay back the loan, but are mostly even risk-adverse.

In the original data of CHFS, 4,889 families did not answer the question if they were facing constraints or not. The proportion of families facing credit constraints is 18.9 percent, which is almost the same as the statistical description (17.9 percent). Since many families did not fill out the questionnaire when asking the question about the credit constraints the number of participants declined from 8,438 to 1,559. Reflecting from the result of the regression, credit constraints do not have a noticeable impact on owning risky assets. One reason for that might be that people who are suffering credit constraints are not willing to answer the questionnaire about this question as they do not want others to know about their financial condition. Only completely filled out questionnaires were admitted to this analysis, this is why the number dropped drastically.

People with credit constraints do not have much fortune for holding risky assets. The lack of wealth makes most of them reluctant to take the risk of investing in financial products
and holding risky assets. However, as the result indicates, credit constraints do not have a relationship with holding risky assets. Considering, leaving the one question blank, we think that reason lead to a bias. It can be a reason for the dissimilar outcome of this and previous research in the circumstance of Chinese households.

The household can use enough money to make a financial investment when the family can effectively solve the cash flow problems in life or production and operation. It is an important way to alleviate the status of household credit constraints for changing the household's assets allocation. The gradual improvement of personal and family credit system is conducive to reducing the risk cost caused by the information asymmetry so that banks have the adjustment space to reduce the conditions for approval of household loans.

6.2 Age

Furthermore, we consider other aspects that may have a relationship with household assets. For the variable age, the results are consistent with our hypothesis, and the relationship between age and risky assets holding matches the life-cycle theory and shows inverted “U” shape.

From the theory, the key issue of the life-cycle theory is getting into debt in times of lower earnings, and paying off the debt during the period of higher earnings. For the time a teenager is turning into an adult, a loan from a bank might be needed. After saving enough money, they will pay the loan back and have additional money to invest in the financial market as well as holding risky assets. Therefore, people in their middle-age are having a peak with holding risky assets. After that period, the retirement, they will tend to have a stable life and become more risky-adverse. At this time they will change their assets allocation, while selling part of the risky assets and convert it into savings, which is why the relationship between age and risky assets is non-linear.

With changes in the population structure, the financial market needs innovative new products for old people to fit the trend. They need to be risk-free but can also get a relatively higher return on investment compared to own government bonds.
6.3 Urban Households

In general, banks prefer to lend money to those who have real estates as mortgage. From our study we observed, people who live in urban areas are more likely to hold risky assets since the value of the properties in urban areas is several times more than in rural regions. Without credit constraints, the probability of people investing in financial markets and holding risky assets will rise. The analysis shows that people living in cities with relatively higher education levels, are more likely to hold risky assets. Besides, those who live in urban areas are having a closer contact to the financial market, with information about changes in an appropriate timely manner. Consequently, a strong education level of the investors is necessary, as better education will most likely lead to higher future income and help people to get rid of the credit constraints they are facing, which is conducive to household participation in the financial market.

Household education background will affect the investment decision-making behaviour, and the financial investment experience will also help the household to understand the financial products, to make the households familiar with the financial market. Therefore, increasing the publicity of related financial products and providing objective investment guidance to households will help to promote the active development of financial markets.
Reference


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