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## Article

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# Investment in children's higher education and household asset allocation in China

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## ABSTRACT

This paper explores how the anticipated expenditure on children's college education affects household asset allocation, applying a two-stage budgeting model of asset demand by using the 2016 China Family Panel Studies Data (CFPS). The empirical results show that if a household plans to send a child to college, the probability of holding risky assets increases by 1.7 percentage points, and the probability of holding investable housing assets increases by 3.8 percentage points. Furthermore, we also find that as the expected year of college entry approaches, households prefer less liquid assets. When the expected year is still far in the future, they prefer liquid assets with high-risk and illiquid assets with high-return. These findings imply that policymakers should make reforms in the financial market and real estate market, as well as provide more kinds of investment products, thereby promoting household investment diversification.

## ARTICLE HISTORY

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## KEYWORDS

Household asset allocation; children's education investment; higher education; study abroad; China Family Panel Studies

## 1. Introduction

Asset allocation is an important issue for every household, which needs to decide what kinds of assets to hold and how much of each kind (Bergstresser & Poterba, 2004). Households select among real assets such as housing and land, and financial assets such as funds and stocks (Gomes, Haliassos, & Ramadorai, 2021). China has experienced continuous rapid growth of housing prices in the last twenty years, and housing assets account for a relatively high share of total household assets.<sup>1</sup> According to the China Household Finance Survey 2017, housing assets accounted for 77.7% of total household assets in China, whereas financial assets accounted for only 11.8%. Among the 10 largest economies, China has by far one of the largest percentages in housing assets and one of the lowest percentages in financial assets.<sup>2</sup> Compared with other sorts of household assets, housing assets are illiquid and often accompanied by mortgage liabilities. The higher proportion of real estate absorbs the liquidity from the family financial position

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<sup>1</sup>Data source: China Urban Household Wealth Health Report, 2018.

<sup>2</sup>Data source: China data come from the China Household Finance Survey (2017), and the China Urban Household Wealth Health Report (2018); U.S. data come from the Survey of Consumer Finance (2016); other countries data come from the Credit Suisse Global Wealth Report (2017).

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and squeezes the ability of the household to invest in financial assets (Chetty & Szeidl, 2007; Flavin & Yamashita, 2002). Moreover, because of the lack of risk diversification markets for housing, it is often perceived as a source of underlying risk for households, affecting their asset allocation behavior (Heaton & Lucas, 2000). As one of the most important emerging economies, Chinese households have much of their wealth in tangible assets, and relatively low levels of financial assets (Badarinza, Balasubramaniam, & Ramadorai, 2019), which implies that real estate is the mainstay, and financial assets are the supplement in Chinese household portfolios (Liao, Huang, & Yao, 2010), it also indicates that unbalanced household asset allocation is becoming an increasingly important issue in China.

The expenses of children's education have become an important expenditure category in total household consumption in China (Yang & Chen, 2009). In the 2017 China Institute for Educational Finance Research-Household Survey report (CIEFR-HS), at the pre-school and basic education levels, the share of total household consumption dedicated to annual educational expenditure per student was 13.2%. From 2000 to 2021, the gross enrollment rate of higher education in China increased from 12.5% to 57.8%, which implies that more and more families are responsible for the cost of college education for their children, and the increased likelihood of higher education spending has changed the family's expectations for future education spending. Education expenditure for children, especially the cost of college tuition, has become the primary consideration for Chinese parents after solving their basic needs.

In addition, the number of Chinese students studying abroad has been increasing rapidly in recent years. China has become the largest source of international students in the world. By 2018, the total number of students studying abroad was 662,100, of which 596,300 were self-funded.<sup>3</sup> Almost all the educational expenditures for Chinese international students in the U.S. come from personal funds (Bound, Braga, Khanna, & Turner, 2020). Generally, sending a child to study abroad takes a larger percentage of household income than having a child study domestically, and the household's ability to do so depends on the household's savings and future income as well as its current income. Furthermore, some research shows that the growth of housing income/wealth is an important source of income for Chinese families to pay tuition abroad (Khanna, Shih, Weinberger, Xu, & Yu, 2020). Consequently, the rising cost of educational expenses in China combined with the willingness to send the child to study abroad may cause parents to have high anticipation of educational expenditure in the future. The need for funds to finance college is likely to stimulate households to change their asset allocation and portfolio choices while increasing the motive for precautionary household savings, thereby seeking higher returns. Understanding how Chinese households allocate their resources in anticipation of their children's higher educational expenses is thus of paramount importance.

Households always have a wealth accumulation motive. Two main reasons are precautionary saving due to future uncertainty and income risks (Deaton, 1991) and retirement saving to smooth consumption over the life cycle (Gomes & Michaelides, 2005; West & Worthington, 2019). Household financial decisions are complex, interdependent, and heterogeneous (Gomes et al., 2021). For instance, several studies have

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<sup>3</sup>Data source: Ministry of Education of China.

presented empirical evidence that having and raising children play a fundamental role in portfolio choice (Bogan, 2015; Love, 2010). Such as Browning (1992) finds that the presence of children can significantly affect most aspects of household economic decisions. Jia, Zhou, and Yang (2021) estimate the effect of the “selective two-child” policy in China and find that the prospect of having a second child may have led to an unintended new precautionary saving incentive. In addition, planning for children’s college expenses will further increase household precautionary savings. Yilmazer (2008) examines the effect of expected expenditure on children’s college education on household savings and finds that households choose to save in advance for this expected expense in order to achieve consumption smoothing. In addition to affecting household savings, children’s education also can affect household asset allocation. Bogan (2015) points out that more and more families struggle with decisions about financing the rising cost of higher education for their children, as well as other portfolio decisions. For example, she finds that households invest in more risky assets and are more likely to have a tax-advantaged college saving plan when they anticipate that a child is going to college.

Several determinants of household asset allocation have been well established in the existing literature, including family characteristics (Campbell, 2006; Guiso & Jappelli, 2002), health status (Bogan & Fertig, 2013; Cardak & Wilkins, 2009; Rosen & Wu, 2004), age structure (Blommestein, 2001; Zhang, Fang, Jacobsen, & Marshall, 2018), gender difference (Hillesland, 2019), social security (Maurer, Mitchell, & Rogalla, 2010), social networks (Jiang, Sun, & Zhang, 2022), saving goals (Changwony, Compbell, & Tabner, 2021), income inequality (Song, Wu, & Zhou, 2020; Tran, Ong, & Nguyen, 2020), taxation regulations (Alan, Atalay, Crossley, & Jeon, 2010; Ochmann, 2014), and so on. As for studies on children and household investment decisions, Browning (1992) points out that the presence of children can affect household economic decisions; Bogan (2013) documents that children’s genders can have an impact on household stock market participation with female children significantly increasing the probability of stockholding. Children’s health also can influence household asset allocation. Bogan and Fernandez (2017) find that households with at least one child with a mental health problem commonly have a decreased probability of holding risky assets. Also, Roussanov (2010) develops a model of the life-cycle portfolio to explore the effect of investing in human capital on the portfolio choice, and points out that human capital in this model can be interpreted more broadly, including investment in children. Although numerous behavioral factors already have been brought to light as having an impact on household asset allocation, only a few empirical studies address the issue of investment in children’s education (Lefebvre, 2004).

In this paper, we apply a two-stage budgeting model of asset demand to estimate the relationship between anticipated investment in children’s college educations and household asset allocation decisions in China by using China Family Panel Studies (CFPS) Data. Our results show that if a household plans to send a child to college in China, the probability of holding risky assets and investable housing assets will increase; if a household plans to send a child to go abroad, the probability of holding risky assets will increase, but the probability of holding illiquid assets will decrease. Furthermore, we also find that the expected year of college entry also affects the household asset allocation preferences.

This study differs from the existing literature in three important ways. First, we classify the household assets as liquid (financial assets) and illiquid (housing assets). We distinguish between households with only one unit of housing and households with more units because the first housing asset is considered a necessity of life in China. However, the second housing unit and higher may be considered as investments in illiquid assets (Shang & Zang, 2016). Most of the previous studies focus on household stock market participation (Fagereng, Gottlieb, & Guiso, 2017; Gomes & Michaelides, 2005). Addoum (2017) finds that young households allocate more assets to stocks. But the situation is a stark contrast with China because, for most young households, housing assets are the most important asset in their portfolio, and housing assets always can crowd out household stock asset holdings (Wu & Lv, 2013). Households prefer to hold housing assets as a large part of household assets, possibly because housing has dual properties of investment and consumption (Yao & Zhang, 2005), they probably expect that housing will continue to appreciate in the foreseeable future. Therefore, households prefer to hold housing assets in spite of illiquidity.

Second, we analyze the expected expense of studying abroad for the children's education. Because studying abroad is more expensive than studying domestically, we can analyze whether different levels of expected expenses for a child's education have different effects on the household investment decision in China. Finally, using China Family Panel Studies (CFPS) Data, we perform an in-depth empirical analysis and provide a rigorous empirical evaluation of the effect of children's anticipated college expenses on household portfolio decisions. Our results imply that increasing expected education expenses for children affects household investment choices in China. For example, if a household plans to send a child to college, the probability of holding risky assets and investable housing assets will increase. These findings not only highlight the effect of children's college education on household asset allocation but also help us to understand the size of this effect on the household portfolio. This effort also could provide some guidance for policy implications for unbalanced household asset allocation issues in China.

The remaining part of the paper is arranged as follows. [Section 2](#) gives the background on higher education reform and urban housing policy reform in China. [Section 3](#) reviews the data used in the empirical analysis. [Section 4](#) presents hypotheses and the empirical strategy. [Section 5](#) discusses the main results. [Section 6](#) implements a robustness check. [Section 7](#) summarizes the key findings and provides concluding remarks.

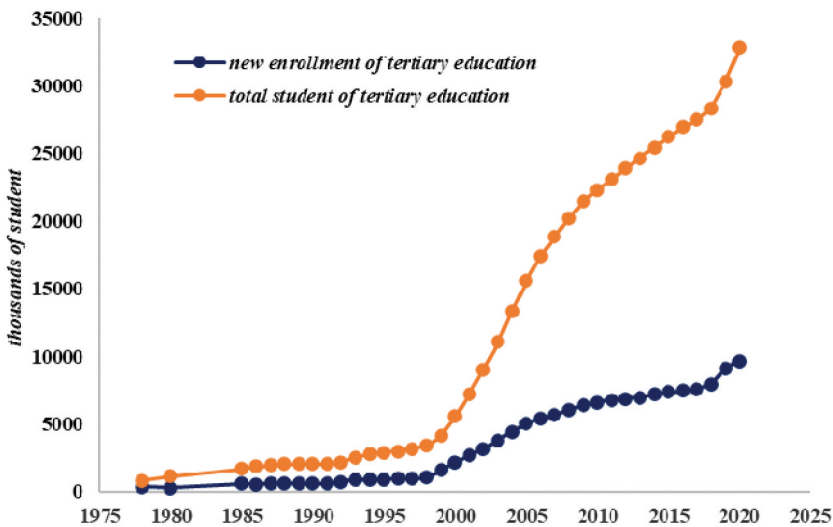
## 2. Background

China represents a relevant and promising setting to study how anticipating investment in children's higher education affects household asset allocation. First of all, China is the world's second largest economy, and it is also has the world's largest population. According to the statistics from the Ministry of Education, China has the largest total number of students in higher education, 44.30 million students in 2021. In 2011, China became the world's largest supplier of international students, and from 2000 to 2019, a total of 6,225,645 Chinese students studied abroad. These facts show that China is an important country to study both because of its size and because of its impact on other

countries' educational systems and financial markets. China also has undergone several notable policy changes in the past few decades, including in higher education and in the urban real estate market. Higher education in China changed dramatically in 1999 due to higher education reforms that shifted the responsibility for tuition and fees from the state to families, and the 1998 urban housing policy reform changed the form of direct distribution of housing to employees to cash distribution, which the employees then use to buy housing on the market. In order to provide a detailed policy background for this study, in this section, we discuss the higher education reform and urban housing policy reform in China.

### 2.1. Higher education reform in China

Higher education in China changed dramatically in 1999 due to higher education reforms that shifted the responsibility for tuition and fees from the state to families. Government expenditure dominated tertiary education before the 1999 reform, accounting for 78.3% of total tertiary education expenditure in 1997. The scale of higher education was constrained by the state's fiscal revenue, hindering its development until 1999. According to the China Education Statistics Yearbook, in 1978, there were only 598 ordinary colleges and universities, enrolling 402,000 students. The total number of students in higher education institutions was 856,000 in 1978. By 1998, the number of newly enrolled students in higher education institutions and the total number of students in higher education institutions were 1.1 million and 3.4 million, respectively (see Figure 1). Growth was slow in this period before reform.

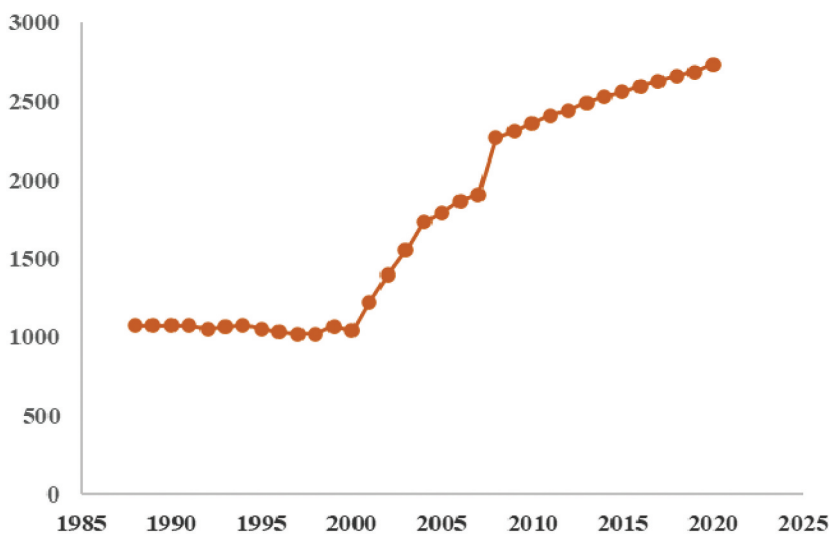


**Figure 1.** New enrollment and the total number of students in tertiary education in China (1978–2020). Notes: Data from the Ministry of Education of China.

The core content of the reform of higher education in 1999 was the expansion of new enrollment<sup>4</sup> and the implementation of the charging system (Yang & Chen, 2009). Since 1999, colleges and universities have implemented a tuition-and-fee-based system while expanding enrollment. By 2020, there were 2,738 colleges and universities in China (see Figure 2), and the new enrollment of ordinary higher education institutions reached 9.68 million. The total number of students in ordinary higher education institutions reached 32.85 million (see Figure 1). The total number of students in all kinds of higher education institutions in China reached 41.83 million, becoming the world's largest higher education country.<sup>5</sup>

With the rapid expansion of the scale of higher education, expenditure on higher education grew rapidly, rising from 54.9 billion yuan to 1.3 trillion yuan between 1998 and 2019. State investment in higher education also rose rapidly, from 35.6 billion yuan in 1998 to 842.7 billion yuan in 2019. However, this growth rate was too slow to fulfill the increasing demands for higher education. The funding gap for higher education is also increasing, and tuition and fees, social donations, loans, etc., have become an important way for colleges to make up for the funding gap. Figure 3 shows that the tuition and fees of colleges and universities increased from 7.3 billion yuan in 1998 to 265.5 billion yuan in 2019, increasing more than 30 times in 20 years.

The reform of higher education in 1999 caused two direct consequences: first, more and more people got the opportunity to enter colleges and universities. In 1998, the gross enrollment rate of higher education in China was only 9.8%; four years later, the gross enrollment rate of higher education reached 15% (Ministry of Education, 2009). By 2017,

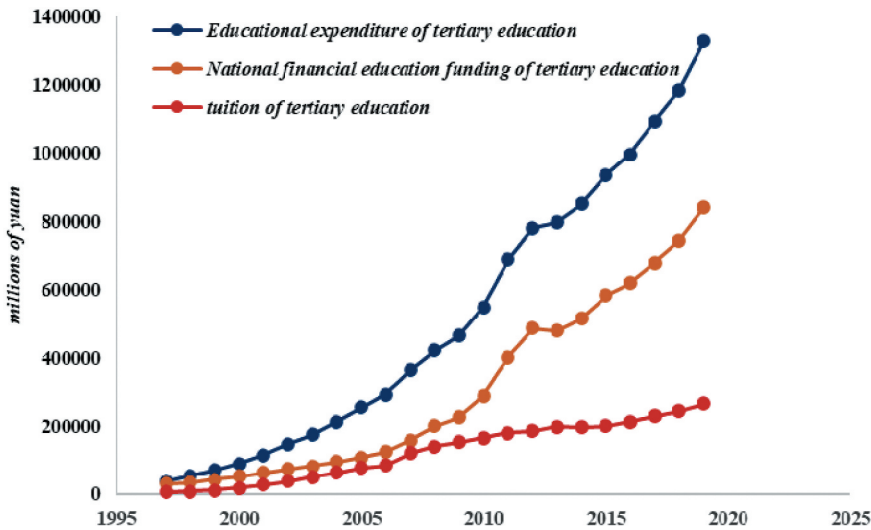


**Figure 2.** The number of colleges and universities in China (1988–2020). Notes: Data from the Ministry of Education of China.

<sup>4</sup>Here refers to "1st year students".

<sup>5</sup>Data source: Ministry of Education in China.





**Figure 3.** National financial funding and tuition of tertiary education in China (1998–2019). Notes: Data from the Ministry of Education of China.

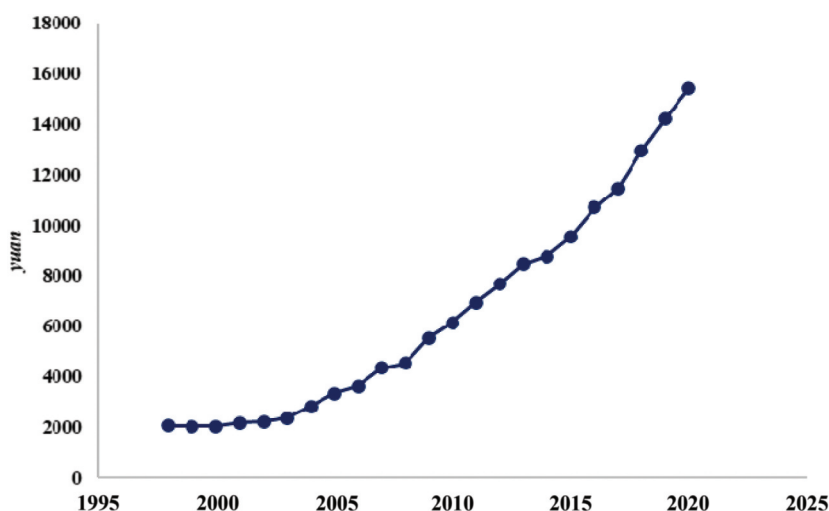
the gross enrollment rate of higher education in China reached 45.7%. Second, more and more families are responsible for the cost of college education for their children, and the increased likelihood of higher education spending has changed the family's expectations for future education spending. Family expenditure on college education has increased substantially. College expenses (including tuition, accommodation, and living expenses) equal more than 30% of the family's annual income in our sample on average, and these expenses have become of primary concern for Chinese households.

The rapid expansion of higher education produces a large number of university graduates, which makes the labor market more competitive and complicated. Therefore, in order to enhance their children's competitiveness in the job market in the future, many middle-class families decide to send their children to study abroad. The number of students studying abroad increased seventeen-fold from 38,989 students in 2000 to 703,500 in 2019. From 2000 to 2019, a total of 6,225,645 Chinese students studied abroad. Studying abroad is almost completely self-funded, with the proportion of self-funded students consistently around 90%.<sup>6</sup> Since 2011, China has been the world's largest origin country for international students (Ministry of Education of China, 2012). Consequently, the expenses of studying abroad have also become an important part of households' expected educational expenditure in China.

## 2.2. Urban housing policy reform in China

From 1949 to 1980, the Chinese government implemented the welfare-oriented public housing distribution system. Under the planned economic system, urban housing was characterized by public ownership, physical distribution, and low rents charged to workers. As a result of urban housing policy reform that started in 1980, housing became

<sup>6</sup>Data Source: China Statistic Yearbook 2019 and Ministry of Education of the People's Republic of China.



**Figure 4.** The average housing unit price in China (1998–2020). Notes: Data from the National Bureau of Statistics of China.

a commodity, and Chinese real estate became an industry. Reform went further with the 1994 “Decision on Deepening the Reform of Urban Housing System.” Since then, housing commercialization and market-oriented reforms have been comprehensively promoted.

On 3 July 1998, in response to the 1997 Asian financial crisis, the State Council issued the “Notice on Further Deepening the Reform of Urban Housing System and Accelerating Housing Construction (1998),” which terminated welfare housing and implemented housing distribution monetization. More specifically, the 1998 policy changed the form of direct distribution of housing to employees to cash distribution, which the employee uses to buy housing on the market. As a result, nationwide urban housing construction expanded substantially, and the real estate economy became important. Chen and Zhao (2012) also point out that the Chinese real estate market has been newly formed since the transition of the planned economy to the market economy, and especially since the reform of China’s housing monetization in 1998.

In August 2003, the State Council issued the “Notice on Promoting the Sustainable and Healthy Development of the Real Estate Market (2003),” which clarified that real estate is the pillar industry of the national economy. Henceforth, welfare housing became history, and housing consumption became the independent choice of residents. In the past two decades, real estate in China has always been appreciating. The national average unit housing price increased from 2,063 yuan in 1998 to 15,440 yuan in 2020.<sup>7</sup> Housing prices have grown rapidly since 2003 (see Figure 4).

<sup>7</sup>We use 1998 as the base period to recalculate all the prices in Figure 6, and these prices are the unit price per square meter.

### 3. Data

We use data from the China Family Panel Studies (CFPS).<sup>8</sup> A nationally representative, annual longitudinal survey of Chinese communities, families, and individuals, CFPS implemented its baseline survey in 2010 and four waves of full sample follow-up surveys in 2012, 2014, 2016, and 2018. The CFPS baseline sample covers 25 provinces/municipalities/autonomous regions, representing 95% of the Chinese population. The 2010 baseline survey interviewed a total of 14,960 households and 42,590 individuals, and it is China's first large-scale academically-oriented longitudinal survey project. The data used for our empirical analysis come from the 2016 CFPS survey data because this year contains the variables relevant to our analysis. The dataset includes information about demographics, detailed household assets, children's education, and family income. Our research sample covers 30 provinces/municipalities/autonomous regions and contains 5,268 observations. [Figure 5](#) shows the distribution of survey samples by geographic area in the empirical analysis, and [Table 1](#) gives a detailed description of all the variables used in our study.

#### 3.1. Children's educational investment measures

[Table 1](#) provides the variables used in the econometric analysis. Following [Bogan \(2015\)](#), we use two kinds of dummy variables to measure the anticipated educational investment in children. First of all, according to the question, "What is the highest level of education you wish your child can obtain?",<sup>9</sup> we create a dummy variable. Overall, the percentage of respondents that hope at least one of their children can get a college education or higher is more than 88%. Parents who plan to send their child to college have an anticipated college expense. The second measure is also a dummy variable which comes from a question, "Have you thought about sending your child to study abroad?". More than 22% of respondents answered, "Yes," indicating a hope that at least one of their children can study abroad. We use this variable to measure the effect of expected expenditure of study abroad on household asset allocation.

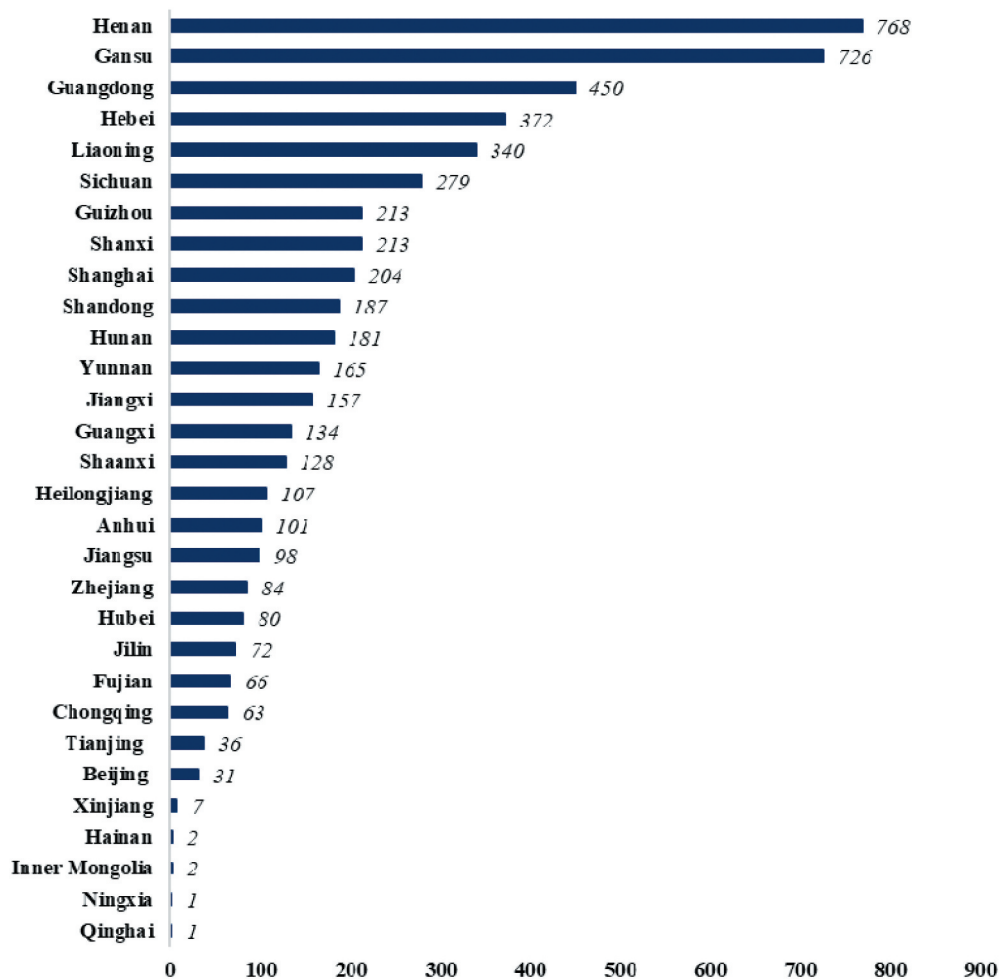
The CFPS questionnaire consists of four main questionnaire types: community, family, adult, and children. All the questions used to measure educational investment in children are in the children's questionnaire, and in this database, the age of the oldest child is 15 years old. Therefore, in this study, our samples only include households with children aged 15 and younger.

#### 3.2. Household portfolio measures

Two common approaches to analyze portfolio decisions involve classifying financial assets by levels of risk ([Bogan, 2015](#); [Rosen & Wu, 2004](#)) and by liquidity ([Campanale, Fugazza, & Gomes, 2015](#)). Accordingly, we will focus on safe assets and risky assets, and liquid assets (financial assets) and illiquid assets (housing assets), respectively. Existing

<sup>8</sup>The CFPS is sponsored by the Chinese government through Peking University.

<sup>9</sup>The levels are primary school, junior high school, Senior high school, 3-year college, 4-year college/Bachelor's degree, master's degree, doctoral degree, or no need to go to school.



**Figure 5.** The distribution of survey samples in the empirical analysis.

research doesn't draw a clear division between "rigid demand" housing<sup>10</sup> and investment property. In China, "rigid demand" housing refers to the first home that young people must buy if they want to take root in the city; obviously, this type of housing is not investment-oriented. There is also a consensus in the existing literature the first house is a necessity for living, whereas the second house and above may show investment demand for housing (Gan, 2010; Shang & Zang, 2016; Shi & Wang, 2017). In the U.s., the first house is viewed as an investment because people can sell their houses in the city after retiring and then move to a small town in which the housing price is much lower. However, in China, due to the lack of medical resources, people don't want to move from big cities to small towns or rural areas, especially when they get old. The quality of health care is poorer in rural areas than in urban areas. Most of the good hospitals are in big

<sup>10</sup>"rigid demand" housing refers to a term generated by the real estate agent during the marketing process in China.

Source: <https://baike.baidu.com/item/%E5%88%9A%E9%9C%80%E6%88%BF/9056947?fr=aladdin>

**Table 1.** Variables used in the model.

Variable	Description	Unit
<i>own_safe</i>	Owns safe assets (cash and bank deposits) dummy	Owns cash and bank deposits = 1 otherwise = 0
<i>own_risk</i>	Owns risky assets (financial products) dummy	Owns financial products = 1 otherwise = 0
<i>own_financial</i>	Owns financial assets dummy	Owns financial assets = 1 otherwise = 0
<i>own_housing</i>	Owns housing assets dummy	Owns housing assets = 1 otherwise = 0
<i>own_otherhousing</i>	Owns any other housing units dummy	Owns two or more housing unit = 1 otherwise = 0
<i>safe_ratio</i>	Share of total financial assets devoted to safe assets	% of household financial assets
<i>risk_ratio</i>	Share of total financial assets devoted to risky assets	% of household financial assets
<i>financial_ratio</i>	Share of total assets devoted to financial products	% of household total assets
<i>housing_ratio</i>	Share of total assets devoted to housing assets	% of household total assets
<i>otherhousing_ratio</i>	Share of total assets devoted to other housing assets	% of household total assets
<i>plan_college</i>	Has anticipated college expenses for child dummy	Go to college = 1 otherwise = 0
<i>plan_abroad</i>	Has a plan to send the child to study abroad dummy	Go abroad = 1 otherwise = 0
<i>total_plan_college</i>	The number of children anticipated going to college	# of children go to college
<i>total_plan_abroad</i>	The number of children planned to send to study abroad	# of children go abroad
<i>fincome</i>	Household income	10,000 yuan
<i>net_wealth</i>	Household net total assets	10,000 yuan
<i>family_size</i>	Total number of people in the household	# of people
<i>age</i>	Household head age	Age
<i>age_square</i>	The square of household head age	Age
<i>gender</i>	Household head gender	Men = 1, women = 0
<i>illiterate</i>	Household head education year less than 6 years	Less than 6 years = 1 otherwise = 0
<i>elementary</i>	Household head education years equal to or more than 6 years and less than 9 years	Equal to or more than 6 years and less than 9 years = 1 otherwise = 0
<i>junior</i>	Household head education years equal to or more than 9 years and less than 12 years	Equal to or more than 9 years and less than 12 years = 1 otherwise = 0
<i>high</i>	Household head education years equal to or more than 12 years and less than 16 years	Equal to or more than 12 years and less than 16 years = 1 otherwise = 0
<i>university</i>	Household head education year equal to or more than 16 years	Household head education year equal to or more than 16 years = 1 otherwise = 0
<i>healthy</i>	Household head healthy status	Good = 1, poor = 0
<i>married</i>	Household head married dummy	Married = 1, not married = 0
<i>employment</i>	Household head employed dummy	Employed = 1, unemployed = 0
<i>pension</i>	Household head has a pension dummy	Has pension = 1 otherwise = 0
<i>health_ins</i>	Household head has health insurance dummy	Has health insurance = 1 otherwise = 0
<i>num_chil</i>	Number of children in the household	# of people
<i>age_oldest_child</i>	Age of the oldest child in the household	Age
<i>boy_ratio</i>	The household ratio of boys to total number of children	% of boy

cities (Comprehensive Ranking of Chinese Hospitals 2020). In light of this, we consider investable housing assets<sup>11</sup> as illiquid assets in our model. We exclude the housing where the household is currently living from the investable housing assets.

Cash and bank deposits are classified as safe assets, financial products (for example, stock, fund, government bonds, trust products, foreign exchange products, et al.) as risky assets. We regard financial assets as liquid assets and housing assets as illiquid assets.

<sup>11</sup>In China, "Real estate mortgage" refers to the RMB loan applied by the borrower (a natural person) who uses the real estate under his/her name to the bank for one-off or recycling consumption or business purpose with the real estate (housing, commercial and residential dual-use housing). Although people can use their housing to borrow money from the bank, in most situations households won't use this money on children's education especially for study abroad, furthermore, if households just own one unit housing, it means this housing is "rigid demand" housing not an investable housing.

Therefore, first, we create five dummy variables for different kinds of household assets. According to the question, “What is the total amount of cash and bank deposits currently held by all your family members,” we create a dummy variable for safe assets. According to the question, “Does your family own any financial products, for example, stocks, funds, government bonds, trust products, foreign exchange products, and so on,” we create a dummy variable for risky assets. For dummy variables of liquid assets and illiquid assets, we use variables of household total financial assets and household gross housing assets in the survey data. We create a dummy variable for investable housing assets according to the question, “Any other housing unit owned by family members?”.

We examine the effects of expectations of children’s college education on the probabilities of owning types of assets and on their portfolio shares. Accordingly, we use the ratio of safe assets and of risky assets to total financial assets to calculate the safe assets share and the risky assets share. We use the total financial assets and the total housing assets to calculate the liquid assets share and the illiquid assets share of total household assets. Finally, we calculate the investable housing assets share according to the other-housing assets as the share of total household assets.<sup>12</sup>

From Table 2, we can see the summary statistics for the assets variables in the samples. These statistics indicate that over 91% of households hold housing assets (20.65% of households hold more than one housing unit), and more than 68% of households hold safe assets, but just 4.42% of households hold risky assets. The housing ownership rate in China is really high; for example, the homeownership rate in the United States was 65.1% in 2019.<sup>13</sup> This may be related to the importance of the house in Chinese people’s eyes. Since ancient times, Chinese people have attached great importance to the concept of housing (Deng, 2019). Numerous other factors may affect the relationship between the dependent variables and independent variables, such as family size. Therefore, we discuss control variables next.

### 3.3. Control variables

Several determinants of household asset allocation have been well established in the existing literature. First, a large number of studies on household asset allocation have concentrated on family characteristics (Campbell, 2006; Ge, Chen, Zou, & Zhou, 2021; Guiso & Jappelli, 2002), such as family size (Browning, 1992). Second, health status could affect household investment decisions (Cardak & Wilkins, 2009; Rosen & Wu, 2004). Third, studies have shown that with the change in age structure, the choice and allocation of assets to the household will change (Blommestein, 2001; Zhang et al., 2018). Fourth,

<sup>11</sup>In China, “Real estate mortgage” refers to the RMB loan applied by the borrower (a natural person) who uses the real estate under his/her name to the bank for one-off or recycling consumption or business purpose with the real estate (housing, commercial and residential dual-use housing). Although people can use their housing to borrow money from the bank, in most situations households won’t use this money on children’s education especially for study abroad, furthermore, if households just own one unit housing, it means this housing is “rigid demand” housing not an investable housing.

<sup>12</sup>Because the total financial assets also include the money lent to relatives/friends or other individuals and institutions (e.g., private loan institution), the summation of safe\_ratio and risk\_ratio in Table 2 is not equal to 1. “Private loan” refers to loans between individuals, between individuals and enterprises, and between enterprises. It does not involve any legal financial organizations. In addition to the housing assets and financial assets, the total household assets also include land assets, durable goods assets, agricultural machinery assets, and the other unpaid off debts, etc., which is why the summation of financial\_ratio, housing\_ratio, and otherhousing\_ratio is not equal to 1, either.

<sup>13</sup>Data source: <https://www.statista.com/statistics/184902/homeownership-rate-in-the-us-since-2003/>.

**Table 2.** Summary statistics.<sup>14</sup>

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>own_safe</i>	5,268	0.6819	0.4658	0	1
<i>own_risk</i>	5,268	0.0442	0.2056	0	1
<i>own_financial</i>	5,268	0.7217	0.4482	0	1
<i>own_housing</i>	5,268	0.9121	0.2832	0	1
<i>own_otherhousing</i>	5,268	0.2065	0.4049	0	1
<i>safe_ratio</i>	3,802	0.8401	0.2981	0	1
<i>risk_ratio</i>	3,802	0.0225	0.1109	0	1
<i>financial_ratio</i>	5,256	0.1125	0.1770	0	1
<i>housing_ratio</i>	5,256	0.6045	0.3087	0	1
<i>otherhousing_ratio</i>	5,256	0.0916	0.2143	0	1
<i>plan_college</i>	5,268	0.8825	0.3220	0	1
<i>plan_abroad</i>	5,268	0.2291	0.4203	0	1
<i>total_plan_college</i>	5,268	1.2213	0.7529	0	6
<i>total_plan_abroad</i>	5,268	0.2883	0.5861	0	4
<i>fincome</i> (10,000 yuan)	5,268	6.0231	15.592	0.0005	1038.78
<i>net_wealth</i> (10,000 yuan)	5,268	57.978	172.15	−120.375	5526
<i>familysize</i>	5,268	4.9461	1.7379	2	19
<i>age</i>	5,268	47.288	13.692	16	94
<i>age_squared</i>	5,268	2423.6	1359.8	256	8836
<i>gender</i>	5,268	0.5833	0.4931	0	1
<i>illiterate</i>	5,268	0.2046	0.4035	0	1
<i>elementary</i>	5,268	0.2092	0.4068	0	1
<i>junior</i>	5,268	0.2815	0.4498	0	1
<i>high</i>	5,268	0.1714	0.3769	0	1
<i>university</i>	5,268	0.1333	0.3399	0	1
<i>healthy</i>	5,268	0.8466	0.3604	0	1
<i>married</i>	5,268	0.9087	0.2881	0	1
<i>employment</i>	5,268	0.7728	0.4191	0	1
<i>pension</i>	5,268	0.5222	0.4996	0	1
<i>health_ins</i>	5,268	0.9339	0.2484	0	1
<i>num_chil</i>	5,268	1.4601	0.7462	1	8
<i>age_oldest_child</i>	5,268	8.0131	4.3811	0	15
<i>boy_ratio</i>	5,268	0.5498	0.4380	0	1

a household's financial decisions also are shaped by social security benefits (Hubener, Maurer, & Mitchell, 2016; Maurer et al., 2010). Table 2 provides summary statistics on the control variables in our analysis. It includes household characteristics, the financial status of the household, characteristics of the household head, and children's characteristics. Because family size is a crucial element that impacts household investment decisions (Browning, 1992), we include family size as a proxy variable of household characteristics.

The household financial status variables include family income, family net wealth, whether the household head has a job, whether the household head has a pension, and whether the household head has health insurance. Family income is demonstrated to be an important element that affects household financial planning for higher education (Acemoglu & Pischke, 2001). We use total household assets minus total household debt (including housing debt and nonhousing debt) to calculate household net wealth, and this variable can help us to control for the effects of household wealth and household debt on household portfolios. Having a pension and having health insurance help to offset the uncertainty the household faces when the household head retires or has a health problem.

<sup>14</sup>Here we lose some samples mainly due to answers to questions such as "not applicable", or "refused", or "unknown".

Characteristics of the household head variables include age, gender, years of education, current marital status, and physical health status. Parents with a high degree may want to provide a better education for their children, so we control for the household head's education. Mauldin, Mimura, and Lino (2001) find parents' education significantly affects the household's expenditures on children's primary and secondary education. Considering that different years of education may have different marginal effects, we define five levels of education of the household head, i.e., illiteracy, elementary school, junior school, high school, and college. McCarthy (2004) found that residents' stock market participation increased at first and then decreased with age. Therefore, we use age and age squared as control variables. Empirical literature finds that gender differences in risk preferences are reflected in asset allocation decisions (Bollen & Posavac, 2018; Hillesland, 2019). Moreover, the physical health of the household head also has a significant influence on household asset allocation (Berkowitz & Qiu, 2006; Rosen & Wu, 2004; West & Worthington, 2019).

Finally, we control for the number of children, the age of the oldest child, and the proportion of male children. We control for the number of children because this variable can decrease the parents' resources available for each of their children's college expenses (Yilmazer, 2008). The proportion of male children variable serves to control for the influence of children's gender on household investment decision making (Bogan, 2013)

## 4. Theoretical model, hypotheses, and empirical strategy

### 4.1. Theoretical model

Following (Bogan, 2015), we apply a model of household consumption, investment, and saving behavior that combines with the quality-quantity model. Individuals live for two periods. In the first period, a household  $i$  earns  $y_1^i$ , chooses to have  $n^i$  children, consumes  $c_1^i$ , and chooses how much of savings, to allocate to a safe asset  $s_1^i$ , risky assets  $r_1^i$ , and first housing assets  $h_1^i$ . At the same time, the household may choose invest in other housing assets  $h_2^i$ .

In the second period, with probability  $0 \leq p \leq 1$ , the household will face children's educational expenditure  $ne$ , where  $e$  is the amount of parental support for each child's higher education expenses.<sup>15</sup> At this stage, the return on safe assets is  $r$ , the return on risky assets is  $z$ , and the return on housing assets is  $m$ . The total second-period return on all of the accumulated assets and second-period wage income,  $y_2^i$ , is divided between consumption,  $c_2^i$  and paying for children's educational expenses  $ne$ .

The household derives utility  $U(\cdot)$  from consumption. The household's optimization problem, given  $y_1^i$ , is to choose consumption and asset investment to maximize the value of expected, time-separable utility.

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<sup>15</sup>For simplicity, parents' financial support of children's college expenses is assumed to be equal for all  $n$  children.



$$\begin{aligned}
& \max_{c^i, s^i, r^i, h^i} E[u(c_1^i) + pu(c_2^i - ne) + (1-p)u(c_2^i)] \\
& s.t. c_1^i + s_1^i + r_1^i + h_1^i + h_2^i \leq y_1^i \\
& c_2^i \leq y_2^i + (1+r)s_1^i + (1+z)r_1^i + (1+m)(h_1^i + h_2^i)
\end{aligned} \tag{1}$$

Based on this basic theoretical model, combined with the reality in China, we propose two hypotheses in the next part.

## 4.2. Hypotheses

Higher education reforms in China increased opportunities for students to attend university. According to the tuition fee information of universities in China on the website,<sup>16</sup> the standard tuition is generally 5,000–8,000 yuan per academic year; the accommodation fee is about 1,000 yuan a year, and the living expenses normally are 1,000–2,000 yuan per month, excluding winter and summer vacations every year, and there are 9 months per year. Taking an average, a household needs to spend 21,500 yuan per year to pay for a child to study at the university. In our sample, the average annual household income is 60,231 yuan, so college expenses (including tuition, accommodation, and living expenses) equal more than 30% of these families' average annual income on average. The rising cost of educational expenses in China may cause parents to anticipate a high educational expenditure in the future, stimulating them to change their asset allocation and portfolio choices to seek higher returns (at the cost of higher risk).

Because housing prices have increased over the last two decades, housing assets have become a good household investment choice because they are high-return and low-risk. The growth of housing wealth is an important channel for households to finance studying abroad (Khanna et al., 2020). For example, home transactions in 2018 reached an all-time high, with 1.7 billion square meters and 15 trillion yuan worth of homes traded, a growth of 1.3 percent and 12.2 percent respectively compared to a year earlier (NBS). Considering the “rigid demand” housing we mentioned before, here we propose the first hypothesis:

**Hypothesis 1:** *Households who plan to send their children to college invest more in other-housing assets.*

However, as an investment in the real estate market requires a high level of capital investment, households without sufficient funds will actively seek other forms of investment to obtain higher returns. The development of Internet financing<sup>17</sup> provides Chinese households with more alternative financial products and attracts more households to invest in internet products (Xie & Zou, 2012). With the birth of Yu'E Bao (a money market fund) in June 2013, internet financial products were rapidly promoted in China.

<sup>16</sup>We collect all the tuition fee information from the universities' official website.

<sup>17</sup>Internet financing is a fully effective third-party financing mode with convenient payment, very low market information asymmetry, low transaction costs, and a market that does not rely on financial intermediaries, so it can promote resource allocation efficiency and reduce transaction costs. Our data set does not give separate information about these internet financial products, but our analysis of risky asset investment also would apply to internet products.

Yu'E Bao is a money market fund offered through Chinese E-commerce giant Alibaba. According to the fund's 2018 semi-annual report, the number of Yu'E Bao holders reached 558.6 million, with an average holding of 2,603 yuan.

Households without funds to invest in the housing market would find internet financial products attractive, because they have higher returns than a bank deposit. We classify internet financial products as risky assets. Therefore, we propose the second hypothesis:

**Hypothesis II:** *Households who plan to send their children to college invest more in risky assets.*

Compared to housing assets, bank deposits, and traditional financial products, internet financial products have some comparative advantages (Wei & Song, 2016). Compared to housing assets, the threshold of investing in internet financial products is lower; furthermore, Internet financial products have a higher return than bank deposits, and lower risks than other financial products like stock.

### 4.3. Empirical strategy

We hypothesize that anticipated educational investment in children may affect household asset allocation and portfolio decisions. There are two aims of the empirical analyses: first, to identify whether the expected children's college education expenses have an independent impact on the probability that a household invests in a specific type of asset; second, to determine how the expected education expenses influence the share of total household assets devoted to different kinds of assets.

#### 4.3.1. Ownership probabilities

The baseline model to analyze how the children's expected educational expenses affect the probability of holding different types of assets is as follows:

$$OWNASSET_i = \beta_0 + \beta_1 EduInvest_i + \beta_K X_i + \varepsilon_i \quad (2)$$

Where  $OWNASSET_i$  is a dummy variable holding the value of 1 when household  $i$  owns an asset type (safe assets, risky assets, liquid assets, illiquid assets, and other-housing assets) and zero otherwise. The independent variable  $EduInvest_i$  is a binary variable with a value of 1 if parents said they plan to send their children to go to college or study abroad and zero otherwise;  $X_i$  is the set of household characteristics. Using the 2016 CFPS data, we estimate Equation (2) with the Probit model. The standard errors in all regressions are adjusted for intracluster correlations at the household level (Bogan & Fertig, 2013).

#### 4.3.2. Portfolio shares

We examine the impact of the expected children's education expenses on portfolio shares. Our baseline model specification is as follows:

$$P_i = \beta_0 + \beta_1 EduInvest_i + \beta_K X_i + \varepsilon_i \quad (3)$$

Where  $P_i$  is a variable between 0 and 1 that indicates the percentage of total assets that household  $i$  allocated to housing assets (or financial products or term deposit). The independent variable  $EduInvest_i$  is a binary variable with a value of 1 if parents plan to send their children to go to college or study abroad and zero otherwise. The remaining control variables are identical to the ones used in Equation (2). We employ a Tobit model to estimate Equation (3) because the sample includes a large number of cases where the dependent variable is zero.

## 5. Results

This section is divided into two sections. In the first, we report full sample results. In the second, we report the results for subsamples based on children's age. We only report the coefficients for variables of interest here. Full results are in Appendix Tables A1–A10.

**Table 3.** Full sample probit regressions – marginal effects of key variables.

Variable	<i>own_safe</i>	<i>own_risk</i>	<i>own_financial</i>	<i>own_housing</i>	<i>own_otherhousing</i>
<b>Panel A: College</b>					
<i>plan_college</i>	−0.020 (0.019)	0.017*** (0.004)	−0.016 (0.018)	−0.008 (0.007)	0.038** (0.017)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	5,268	5,268	5,268	5,268	5,268
<i>R</i> <sup>2</sup>	0.042	0.240	0.053	0.169	0.080
<b>Panel B: Abroad</b>					
<i>plan_abroad</i>	−0.015 (0.016)	0.015*** (0.005)	−0.002 (0.015)	−0.014** (0.007)	0.004 (0.014)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	5,268	5,268	5,268	5,268	5,268
<i>R</i> <sup>2</sup>	0.042	0.240	0.053	0.171	0.080

Notes: Robust Standard errors in parentheses. All control variables are included. See appendix for the full set of results. \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table 4.** Full sample tobit regressions – marginal effects of key variables.

Variable	<i>safe_ratio</i>	<i>risk_ratio</i>	<i>financial_ratio</i>	<i>housing_ratio</i>	<i>otherhousing_ratio</i>
<b>Panel A: College</b>					
<i>plan_college</i>	−0.027* (0.016)	0.358*** (0.135)	−0.006 (0.010)	0.024* (0.014)	0.136*** (0.045)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	3,802	3,802	5,256	5,256	5,256
<i>R</i> <sup>2</sup>	0.023	0.217	0.121	0.061	0.049
<b>Panel B: Abroad</b>					
<i>plan_abroad</i>	−0.031** (0.013)	0.178*** (0.051)	0.000 (0.007)	−0.015 (0.011)	0.031 (0.031)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	3,802	3,802	5,256	5,256	5,256
<i>R</i> <sup>2</sup>	0.025	0.218	0.120	0.061	0.047

Notes: Robust Standard errors in parentheses. All control variables are included. See appendix for the complete set of results.

\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

### 5.1. Full sample

The results examining the effect of anticipated college investment in children on household portfolio decisions are presented in [Tables 3 and 4](#). [Table 3](#) shows the Probit regression results for the variables of interest. “Having a plan to send the child to go to college” significantly increases the probability of holding risky assets and other-housing assets, and “having a plan to send the child to study abroad” significantly increases the probability of holding risky assets and decreases the probability of holding illiquid assets. The empirical results show that if a household has a plan to send the child to go to college, it will increase the probability of holding risky assets by 1.7 percentage points and increase the probability of holding investable housing assets by 3.8 percentage points. The regression results are consistent with our expectations. We find evidence that children’s anticipated education expenses can affect household assets choice, which is close to the existing literature. For example, [Browning \(1992\)](#) finds that the presence of children in the household can significantly affect the household’s economic behavior because young children decrease their mother’s labor supply and older children increase household consumption. Our results show that the children’s future education expenditure also significantly impacts the household asset allocation, which enriched the existing research.

When parents anticipate that there will be a college expense in the future, then they prefer to hold high return assets (other-housing assets). Other-housing assets are likely to have the highest expected returns of all assets in China because the price of housing has increased significantly and steadily since the 1980 housing reform. Therefore, when households have enough money to enter the housing market, housing is a good investment choice.

The results also show that households are more likely to own risky assets, which may be due to the rapid development of Internet financing in China ([Xie & Zou, 2012](#)). Internet financial products have higher liquidity than housing assets because they are similar to bank deposits, with real-time cash withdrawal, transfer and settlement functions. However, they are superior to bank demand deposits because they have higher yields, more convenience, and lower handling fees. Internet financial products also have lower risks than stocks because they are money market funds combined with third-party payments. This finding is also consistent with [Bogan \(2015\)](#) who studied the relationship between anticipated college expenses and household asset allocation, finding that having anticipated college expenses increases the probability of investing in risky assets and having a tax-advantaged college savings account in the U.S.

[Table 4](#) shows the Tobit regression results using portfolio shares as the dependent variables. We find that both “having a plan to send the child to go to college” and “having a plan to send the child to go abroad” significantly decrease the share of financial assets devoted to safe assets, and increase the share of financial assets devoted to risky assets. Meanwhile, “having a plan to send the child to go to college” also significantly increases the share of total assets devoted to illiquid housing assets and other-housing assets.

**Table 5.** Marginal effects of key variables for the households whose children will start college within 5 years subsample<sup>18</sup> (Probit).

Variable	<i>own_safe</i>	<i>own_risk</i>	<i>own_financial</i>	<i>own_housing</i>	<i>own_otherhousing</i>
<b>Panel A: College</b>					
<i>plan_college</i>	−0.087** (0.039)	0.000 (0.000)	−0.070* (0.037)	0.004 (0.016)	0.044 (0.033)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	1,057	1,057	1,057	1,057	1,057
<i>R</i> <sup>2</sup>	0.058	0.483	0.067	0.098	0.078
<b>Panel B: Abroad</b>					
<i>plan_abroad</i>	−0.077** (0.038)	−0.000 (0.000)	−0.050 (0.036)	−0.018 (0.017)	−0.017 (0.029)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	1,057	1,057	1,057	1,057	1,057
<i>R</i> <sup>2</sup>	0.058	0.485	0.066	0.101	0.077

Notes: Robust Standard errors in parentheses. All control variables are included. See appendix for the complete set of results.

\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

Overall, if households have an anticipated college education expense in the future, the probability of holding risky assets and other-housing assets will increase, and the share of these two kinds of assets will also increase; as for the safe assets, the probability of holding them does not change with anticipated education expenses, but the share of safe assets decreases. This may be because households invest more in risky assets and other-housing assets, so they transfer part of their safe assets to other kinds of assets. Thereafter, in order to further analyze the relationship between these variables, we divide the sample into two groups based on the expected time remaining until the child enters college.

## 5.2. The expected year of the children go to college

We first separately analyze two groups: “children are expected to go to college within 5 years” and “children are expected to go to college in five years or more.” We separate the sample in this way because the farther away from the expected year, the more households tend to choose assets with higher returns. They can accept some risk because if they lose some money, they have time to make it up. However, the closer to the expected year, the more households prefer high-return and low-risk assets. For this reason, we expect to see that households prefer to hold housing assets when children are expected to go to college within 5 years, and they prefer to choose risky assets and housing assets when children are expected to go to college in five years or more. This consideration would suggest that the portfolio strategies of the household will change as the child gets older. In general, these various differences imply that expected educational investment in children may have differing impacts on a family’s portfolio depending on how much time remains before the child is expected to enter college.

<sup>18</sup>Here our sample only includes children aged 13–15 years old.

**Table 6.** Marginal effects of key variables for the households whose children will start college within 5 years subsample<sup>19</sup> (Tobit).

Variable	<i>safe_ratio</i>	<i>risk_ratio</i>	<i>financial_ratio</i>	<i>housing_ratio</i>	<i>otherhousing_ratio</i>
<b>Panel A: College</b>					
<i>plan_college</i>	−0.037 (0.031)	<b>0.463*</b> (0.262)	−0.031 (0.021)	<b>0.048*</b> (0.029)	<b>0.164*</b> (0.094)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	760	760	1,055	1,055	1,055
<i>R</i> <sup>2</sup>	0.041	0.475	0.179	0.066	0.056
<b>Panel B: Abroad</b>					
<i>plan_abroad</i>	−0.034 (0.031)	−0.155 (0.149)	−0.022 (0.016)	−0.026 (0.025)	−0.032 (0.072)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	760	760	1,055	1,055	1,055
<i>R</i> <sup>2</sup>	0.041	0.469	0.178	0.064	0.054

Notes: Robust Standard errors in parentheses. All control variables are included. See appendix for the complete set of results.

\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

In [Table 5](#), we find that when the expected year of college entry is within 5 years, “having a plan to send the child to go to college or go abroad” significantly decreases the probability of holding safe assets. Furthermore, “having a plan to send the child to go to college” also significantly decreases the probability of holding financial assets. [Table 6](#) shows the Tobit regression results, which show that “having a plan to send the child to go to college” does not change the share of safe assets, but significantly increases total assets devoted to illiquid assets and other-housing assets. These findings are basically consistent with our expectations. When the expected year of college entry becomes close, households prefer to sacrifice liquidity in exchange for high returns, as shown by the positive and significant effect on the risky assets ratio.

In contrast, in [Tables 7 and 8](#)

## 6. Robustness check

In this section, we provide two robustness checks of the results. In the first robustness check, we use “the total number of children who will go to college” and “the total number of children who will go abroad” instead of “having a plan to send the child to go to college” and “having a plan to send the child to go abroad” respectively. [Tables 9 and 10](#) show the results of the Probit model and Tobit model, which indicate that the main results do not change.

In the second robustness check, based on the first robustness check, we include both the expected college attendance and expected study abroad dummies in the same regressions. The results of the Probit model and Tobit model are reported in [Tables 11 and 12](#). The main conclusion has not changed here, either.

<sup>19</sup>Here our sample only includes children aged 13–15 years old.

**Table 7.** Marginal effects of key variables for households whose children will start college five or more years in the future subsample<sup>20</sup> (Probit).

Variable	<i>own_safe</i>	<i>own_risk</i>	<i>own_financial</i>	<i>own_housing</i>	<i>own_otherhousing</i>
<b>Panel A: College</b>					
<i>plan_college</i>	−0.000 (0.022)	<b>0.020***</b> (0.004)	−0.001 (0.021)	−0.012 (0.007)	<b>0.034*</b> (0.020)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	4,211	4,211	4,211	4,211	4,211
<i>R</i> <sup>2</sup>	0.045	0.229	0.059	0.193	0.084
<b>Panel B: Abroad</b>					
<i>plan_abroad</i>	−0.002 (0.017)	<b>0.021***</b> (0.006)	0.006 (0.016)	−0.012 (0.007)	0.009 (0.015)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	4,211	4,211	4,211	4,211	4,211
<i>R</i> <sup>2</sup>	0.045	0.232	0.059	0.193	0.083

Notes: Robust Standard errors in parentheses. All control variables are included. See appendix for the complete set of results.

\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table 8.** Marginal effects of key variables for households whose children will start college five or more years in the future subsample<sup>21</sup> (Tobit).

Variable	<i>safe_ratio</i>	<i>risk_ratio</i>	<i>financial_ratio</i>	<i>housing_ratio</i>	<i>otherhousing_ratio</i>
<b>Panel A: College</b>					
<i>plan_college</i>	−0.024 (0.018)	<b>0.354**</b> (0.150)	0.001 (0.012)	0.016 (0.017)	<b>0.123**</b> (0.051)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	3,042	3,042	4,201	4,201	4,201
<i>R</i> <sup>2</sup>	0.025	0.205	0.141	0.066	0.050
<b>Panel B: Abroad</b>					
<i>plan_abroad</i>	<b>−0.030**</b> (0.014)	<b>0.201***</b> (0.053)	0.004 (0.008)	−0.011 (0.012)	0.043 (0.034)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	3,042	3,042	4,201	4,201	4,201
<i>R</i> <sup>2</sup>	0.026	0.208	0.141	0.066	0.049

Notes: Robust Standard errors in parentheses. All control variables are included. See appendix for the complete set of results.

\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

## 7. Conclusion and discussion

In this study, we have empirically explored in-depth the effects of an expected expense on the children's college educations on households' portfolio choice and asset allocation decisions. A model of household consumption, investment, and saving behavior that includes the quality-quantity model has been constructed and applied to the China Family Panel Studies data.

We find statistically significant effects of anticipated investments in children's college education on household asset allocation in China. In most situations, "having a plan to send the child to go to college" significantly increases the probability of holding risky assets and investable housing assets. The empirical results show that if a household has a plan to send the child to go to college, it will increase the probability of holding risky assets by 1.7 percentage points and increase the probability of holding investable housing assets by 3.8 percentage

<sup>20</sup>Here our sample only includes children aged 0–12 years old.

<sup>21</sup>Here our sample only includes children aged 0–12 years old.

**Table 9.** Robustness check I (Probit).

Variable	<i>own_safe</i>	<i>own_risk</i>	<i>own_financial</i>	<i>own_housing</i>	<i>own_otherhousing</i>
<b>Panel A: College</b>					
<i>total_plan_college</i>	−0.005 (0.011)	<b>0.016***</b> (0.006)	−0.006 (0.010)	<b>−0.010*</b> (0.005)	<b>0.031***</b> (0.010)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	5,268	5,268	5,268	5,268	5,268
<i>R</i> <sup>2</sup>	0.042	0.240	0.053	0.170	0.081
<b>Panel B: Abroad</b>					
<i>total_plan_abroad</i>	−0.003 (0.011)	<b>0.010***</b> (0.003)	0.005 (0.011)	<b>−0.009**</b> (0.004)	−0.000 (0.010)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	5,268	5,268	5,268	5,268	5,268
<i>R</i> <sup>2</sup>	0.042	0.241	0.053	0.170	0.079

Notes: Robust Standard errors in parentheses. All control variables are included. See appendix for the complete set of results.

\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table 10.** Robustness check I (Tobit).

Variable	<i>safe_ratio</i>	<i>risk_ratio</i>	<i>financial_ratio</i>	<i>housing_ratio</i>	<i>otherhousing_ratio</i>
<b>Panel A: College</b>					
<i>total_plan_college</i>	−0.007 (0.009)	<b>0.226**</b> (0.108)	−0.003 (0.006)	<b>0.016**</b> (0.008)	<b>0.087***</b> (0.025)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	3,802	3,802	5,256	5,256	5,256
<i>R</i> <sup>2</sup>	0.022	0.216	0.121	0.061	0.050
<b>Panel B: Abroad</b>					
<i>total_plan_abroad</i>	−0.013 (0.009)	<b>0.145***</b> (0.040)	−0.000 (0.005)	−0.010 (0.008)	0.012 (0.022)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	3,802	3,802	5,256	5,256	5,256
<i>R</i> <sup>2</sup>	0.023	0.218	0.120	0.061	0.047

Notes: Robust Standard errors in parentheses. All control variables are included. See appendix for the complete set of results.

\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table 11.** Robustness check II (Probit).

Variable	<i>own_safe</i>	<i>own_risk</i>	<i>own_financial</i>	<i>own_housing</i>	<i>own_otherhousing</i>
<b>Panel A: Dummy</b>					
<i>plan_college</i>	−0.019 (0.020)	<b>0.016***</b> (0.004)	−0.016 (0.018)	−0.007 (0.007)	<b>0.037**</b> (0.017)
<i>plan_abroad</i>	−0.013 (0.016)	<b>0.013***</b> (0.004)	−0.001 (0.015)	<b>−0.013*</b> (0.007)	0.002 (0.014)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	5,268	5,268	5,268	5,268	5,268
<i>R</i> <sup>2</sup>	0.043	0.245	0.053	0.171	0.080
<b>Panel B: Number</b>					
<i>total_plan_college</i>	−0.005 (0.011)	<b>0.015**</b> (0.006)	−0.007 (0.010)	<b>−0.009*</b> (0.005)	<b>0.031***</b> (0.011)
<i>total_plan_abroad</i>	−0.002 (0.011)	<b>0.009***</b> (0.003)	0.005 (0.011)	<b>−0.008*</b> (0.004)	−0.003 (0.010)
<i>Controls</i>	YES	YES	YES	YES	YES
<i>N</i>	5,268	5,268	5,268	5,268	5,268
<i>R</i> <sup>2</sup>	0.042	0.245	0.053	0.171	0.081

Notes: Robust Standard errors in parentheses. All control variables are included. See appendix for the complete set of results.

\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.



**Table 12.** Robustness check II (Tobit).

Variable	<i>safe_ratio</i>	<i>risk_ratio</i>	<i>financial_ratio</i>	<i>housing_ratio</i>	<i>otherhousing_ratio</i>
<b>Panel A: Dummy</b>					
<i>plan_college</i>	−0.024 (0.016)	<b>0.345**</b> (0.135)	−0.006 (0.010)	<b>0.026*</b> (0.014)	<b>0.133***</b> (0.045)
<i>plan_abroad</i>	<b>−0.029**</b> (0.013)	<b>0.171***</b> (0.051)	0.001 (0.007)	−0.017 (0.011)	0.023 (0.031)
Controls	YES	YES	YES	YES	YES
N	3,802	3,802	5,256	5,256	5,256
R <sup>2</sup>	0.025	0.223	0.121	0.062	0.049
<b>Panel B: Number</b>					
<i>total_plan_college</i>	−0.005 (0.009)	<b>0.208*</b> (0.109)	−0.003 (0.006)	<b>0.018**</b> (0.008)	<b>0.087***</b> (0.026)
<i>total_plan_abroad</i>	−0.013 (0.009)	<b>0.137***</b> (0.040)	0.000 (0.005)	−0.012 (0.008)	0.003 (0.022)
Controls	YES	YES	YES	YES	YES
N	3,802	3,802	5,256	5,256	5,256
R <sup>2</sup>	0.023	0.222	0.121	0.062	0.050

Notes: Robust Standard errors in parentheses. All control variables are included. See [appendix](#) for the complete set of results.

\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

points. We also find that when the expected year of college entry becomes close, households prefer to sacrifice liquidity in exchange for high returns; otherwise, they prefer high-return and high-risk assets when the expected year is still far in the future. We note that the oldest children in the sample are 15 years old, so households with only one or two years left before college entry might prefer to have more liquidity than shown in our results.

The empirical results provide the support that increasing the college education expenses of children has a significant impact on household investment choices in China, especially on the household's risky assets. Due to the rapid development of Internet financing in China, households have more financial product choices. If they don't have enough money to invest in housing assets, they prefer to choose these financial products to seek higher returns. Our results also indicate that most Chinese families prefer to devote a large part of assets to housing assets, perhaps to seek a better education for their children. Steady and significant increases in the price of housing since 1980 have made housing investment low risk and high return assets. As housing assets are a key component of household wealth building in China, these findings could have important policy implications for unbalanced household asset allocation issues.

Therefore, better understanding the relationship between educational investment and investment choices could help to inform policymakers to make some reforms in the real estate market and financial market. It is important and desirable to reduce the high ratio of household housing assets and to provide more types of financial assets in China's current context. On the one hand, the government might regulate the real estate transaction market and improve related policies, such as property tax policy; on the other hand, the government or private sector might design more types of financial assets to meet the different kinds of household's investment needs, such as issuing securities with varying maturities in line with the years of education remaining for students. For example, in the U.S., the government designs tax-advantaged plans, such as 529 plans and Coverdell Education Savings Accounts, to encourage saving for the future higher education expenses of designated beneficiaries. Meanwhile, this understanding might also induce households to adjust their asset allocations, thereby helping these households to keep a healthy asset allocation and long-term good socio-economic status. Given China's size and importance in the world economy, changes in

household investment behavior will have repercussions for the global financial markets. Enabling more Chinese students to study abroad due to better financial opportunities will also impact university enrollments in countries such as the U.S., Canada, and European countries. Furthermore, examining how the effect of children's college education on household investment decision-making differs by gender poses some interesting issues and is a rich area for future research.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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## Appendix

**Table A1.** Full sample probit regressions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	own_safe	own_risk	own_financial	own_housing	own_otherhousing	own_safe	own_risk	own_financial	own_housing	own_otherhousing
plan_college	-0.020 (0.019)	0.017*** (0.004)	-0.016 (0.018)	-0.008 (0.007)	0.038** (0.017)	-0.015 (0.016)	0.015*** (0.005)	-0.002 (0.013***)	-0.014** (0.007)	0.004 (0.014)
plan_abroad						0.011*** (0.001)	0.000* (0.000)	0.013*** (0.002)	-0.000** (0.000)	0.006*** (0.002)
fincome	0.011*** (0.002)	0.000* (0.000)	0.013*** (0.002)	-0.000** (0.000)	0.006*** (0.002)	0.011*** (0.002)	0.000* (0.000)	0.013*** (0.002)	-0.000** (0.000)	0.006*** (0.002)
net_wealth	0.000*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
family_size	-0.013** (0.005)	-0.007*** (0.002)	-0.016*** (0.005)	0.018*** (0.005)	0.014*** (0.004)	-0.013** (0.005)	0.000 (0.002)	0.001*** (0.005)	0.018*** (0.004)	0.014*** (0.004)
age	-0.015*** (0.003)	-0.000 (0.001)	-0.015*** (0.003)	0.006*** (0.002)	0.002 (0.003)	-0.016*** (0.003)	-0.000 (0.001)	-0.016*** (0.003)	0.006*** (0.002)	0.002 (0.003)
age_square	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)
gender	-0.004 (0.014)	-0.007* (0.004)	-0.010 (0.013)	0.007 (0.005)	0.013 (0.012)	-0.004 (0.014)	-0.007* (0.004)	-0.009 (0.013)	0.008 (0.005)	0.012 (0.012)
elementary	0.074*** (0.019)	0.003 (0.009)	0.068*** (0.017)	-0.030** (0.013)	0.034* (0.019)	0.073*** (0.019)	0.004 (0.009)	0.067*** (0.017)	-0.031** (0.013)	0.036* (0.019)
junior	0.077*** (0.018)	0.011 (0.009)	0.061*** (0.017)	-0.042*** (0.014)	0.048** (0.019)	0.076*** (0.018)	0.012 (0.009)	0.061*** (0.017)	-0.043*** (0.013)	0.050*** (0.019)
high	0.092*** (0.021)	0.100*** (0.022)	0.068*** (0.020)	-0.053*** (0.016)	0.058*** (0.022)	0.089*** (0.021)	0.108*** (0.022)	0.066*** (0.020)	-0.054*** (0.016)	0.063*** (0.023)
university	0.076*** (0.022)	0.100*** (0.023)	0.046** (0.022)	-0.075*** (0.019)	0.061** (0.025)	0.075*** (0.022)	0.104*** (0.023)	0.045** (0.022)	-0.076*** (0.019)	0.064*** (0.025)
healthy	0.009 (0.019)	0.004 (0.005)	0.021 (0.018)	0.004 (0.008)	0.024 (0.016)	0.009 (0.019)	0.004 (0.005)	0.021 (0.018)	0.003 (0.008)	0.025 (0.016)
married	0.042* (0.025)	0.013*** (0.004)	0.036 (0.024)	-0.014* (0.008)	0.029 (0.020)	0.042* (0.025)	0.014*** (0.004)	0.035 (0.024)	-0.014* (0.008)	0.030 (0.020)
employment	0.029* (0.018)	-0.002 (0.004)	0.029* (0.017)	0.004 (0.007)	0.015 (0.015)	0.030* (0.018)	-0.002 (0.005)	0.030* (0.017)	0.005 (0.007)	0.013 (0.015)
pension	0.010 (0.015)	0.008** (0.004)	0.019 (0.014)	0.017** (0.008)	0.011 (0.013)	0.010 (0.015)	0.008** (0.004)	0.019 (0.014)	0.017** (0.007)	0.012 (0.013)
health_ins	0.074*** (0.028)	0.003 (0.007)	0.044* (0.026)	0.027* (0.014)	0.017 (0.023)	0.074*** (0.028)	0.004 (0.007)	0.044* (0.026)	0.027** (0.014)	0.018 (0.023)

(Continued)

Table A1. (Continued).

	(1) own_safe	(2) own_risk	(3) own_financial	(4) own_housing	(5) own_otherhousing	(6) own_safe	(7) own_risk	(8) own_financial	(9) own_housing	(10) own_otherhousing
num_chil	-0.003 (0.011)	-0.002 (0.004)	0.003 (0.010)	-0.011* (0.006)	0.001 (0.010)	-0.002 (0.011)	-0.003 (0.004)	0.003 (0.010)	-0.011* (0.006)	0.001 (0.010)
age_oldest_child	0.004** (0.002)	-0.000 (0.000)	0.003** (0.001)	0.001 (0.001)	0.000 (0.001)	0.004** (0.002)	0.000 (0.000)	0.003** (0.001)	0.001 (0.001)	0.000 (0.001)
boy_ratio	0.007 (0.015)	0.003 (0.004)	0.012 (0.014)	-0.012* (0.007)	-0.036*** (0.013)	0.007 (0.015)	0.002 (0.004)	0.011 (0.014)	-0.011* (0.006)	-0.035*** (0.013)
Observations	5,268	5,268	5,268	5,268	5,268	5,268	5,268	5,268	5,268	5,268

Notes:  $R^2$  Robust Standard errors in parentheses.  
\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table A2.** Full sample tobit regressions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio
plan_college	-0.027* (0.016)	0.358*** (0.135)	-0.006 (0.010)	0.024* (0.014)	0.136*** (0.045)	-0.031** (0.013)	0.178*** (0.051)	0.000 (0.007)	-0.015 (0.011)	0.031 (0.031)
plan_abroad										
income	-0.000 (0.000)	0.002* (0.001)	0.001 (0.000)	0.000 (0.000)	0.002 (0.001)	-0.000 (0.000)	0.002* (0.001)	0.001 (0.000)	0.000 (0.000)	0.002 (0.002)
net_wealth	-0.000*** (0.000)	0.001*** (0.000)	-0.000* (0.000)	0.000*** (0.000)	0.001*** (0.000)	-0.000*** (0.000)	0.001*** (0.000)	-0.000* (0.000)	0.000*** (0.000)	0.001*** (0.000)
family_size	0.007* (0.004)	-0.102*** (0.025)	-0.012*** (0.003)	0.012*** (0.004)	0.035*** (0.010)	0.007* (0.004)	-0.100*** (0.025)	-0.012*** (0.003)	0.012*** (0.004)	0.035*** (0.010)
age	-0.002 (0.003)	-0.003 (0.013)	-0.008*** (0.002)	0.013*** (0.002)	0.006 (0.007)	-0.002 (0.003)	-0.001 (0.012)	-0.008*** (0.002)	0.012*** (0.002)	0.006 (0.007)
age_square	0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)
gender	0.001 (0.011)	-0.098* (0.053)	-0.008 (0.007)	-0.016 (0.010)	0.033 (0.028)	0.002 (0.017)	-0.104** (0.053)	-0.008 (0.007)	-0.016 (0.010)	0.030 (0.028)
elementary	-0.004 (0.017)	0.045 (0.124)	0.038*** (0.010)	0.003 (0.013)	0.087** (0.043)	-0.005 (0.017)	0.055 (0.123)	0.037*** (0.010)	0.004 (0.013)	0.095** (0.043)
junior	0.000 (0.016)	0.122 (0.113)	0.053*** (0.010)	-0.018 (0.013)	0.141*** (0.042)	-0.002 (0.016)	0.132 (0.111)	0.052*** (0.010)	-0.017 (0.013)	0.148*** (0.042)
high	-0.023 (0.019)	0.693*** (0.106)	0.060*** (0.011)	0.014 (0.016)	0.202*** (0.047)	-0.025 (0.019)	0.710*** (0.104)	0.059*** (0.011)	0.017 (0.016)	0.218*** (0.047)
university	0.002 (0.020)	0.685*** (0.107)	0.060*** (0.013)	0.006 (0.018)	0.215*** (0.050)	-0.000 (0.020)	0.689*** (0.105)	0.060*** (0.013)	0.009 (0.018)	0.226*** (0.050)
healthy	-0.010 (0.015)	0.034 (0.083)	0.020** (0.009)	0.005 (0.013)	0.069* (0.039)	-0.012 (0.015)	0.038 (0.082)	0.019** (0.009)	0.006 (0.013)	0.073* (0.039)
married	0.015 (0.020)	0.307** (0.124)	0.017 (0.012)	-0.020 (0.017)	0.076 (0.054)	0.014 (0.020)	0.302** (0.125)	0.017 (0.012)	-0.019 (0.017)	0.079 (0.054)
employment	0.003 (0.014)	-0.036 (0.067)	-0.007 (0.009)	-0.064*** (0.013)	-0.012 (0.036)	0.002 (0.014)	-0.036 (0.067)	-0.007 (0.009)	-0.064*** (0.013)	-0.018 (0.036)
pension	-0.019 (0.012)	0.100* (0.057)	0.008 (0.007)	0.009 (0.011)	0.042 (0.030)	-0.019 (0.012)	0.095* (0.056)	0.008 (0.007)	0.009 (0.011)	0.045 (0.030)
health_ins	0.040 (0.025)	0.012 (0.119)	0.000 (0.015)	0.002 (0.022)	0.049 (0.058)	0.040 (0.025)	0.024 (0.118)	0.000 (0.015)	0.002 (0.022)	0.051 (0.058)
num_chil	-0.012 (0.009)	-0.020 (0.055)	-0.002 (0.005)	-0.025*** (0.008)	-0.015 (0.022)	-0.010 (0.009)	-0.029 (0.055)	-0.002 (0.005)	-0.024*** (0.008)	-0.016 (0.022)

*(Continued)*

Table A2. (Continued).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio
age_oldest_child	-0.000 (0.001)	-0.003 (0.006)	0.001* (0.001)	0.001 (0.001)	-0.002 (0.003)	-0.000 (0.001)	-0.002 (0.006)	0.001* (0.001)	0.001 (0.001)	-0.002 (0.003)
boy_ratio	-0.003 (0.012)	0.037 (0.055)	0.022*** (0.007)	-0.023** (0.011)	-0.095*** (0.030)	-0.003 (0.012)	0.029 (0.054)	0.022*** (0.007)	-0.022** (0.011)	-0.093*** (0.030)
Constant	0.852*** (0.071)	-1.794*** (0.375)	0.241*** (0.044)	0.255*** (0.066)	-1.357*** (0.180)	0.841*** (0.070)	-1.562*** (0.362)	0.237*** (0.043)	0.275*** (0.065)	-1.266*** (0.178)
Observations	3,802	3,802	5,256	5,256	5,256	3,802	3,802	5,256	5,256	5,256

Notes: Robust standard errors in parentheses  
\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.



**Table A3.** The households whose children will start college within 5 years subsample (Probit).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	own_safe	own_risk	own_financial	own_housing	own_otherhousing	own_safe	own_risk	own_financial	own_housing	own_otherhousing
plan_college	-0.087** (0.039)	0.000 (0.000)	-0.070* (0.037)	0.004 (0.016)	0.044 (0.033)	-0.077** (0.038)	-0.000 (0.000)	-0.050 (0.036)	-0.018 (0.017)	-0.017 (0.029)
plan_abroad										
income	0.019*** (0.004)	0.000 (0.000)	0.020*** (0.004)	-0.002* (0.001)	0.004* (0.003)	0.019*** (0.004)	0.000 (0.000)	0.020*** (0.004)	-0.002* (0.001)	0.004* (0.003)
net_wealth	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.001* (0.000)	0.001*** (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.001* (0.000)	0.001*** (0.000)
family_size	0.008 (0.012)	-0.000 (0.000)	0.006 (0.011)	0.008 (0.006)	0.007 (0.011)	0.009 (0.012)	-0.000 (0.000)	0.007 (0.011)	0.008 (0.006)	0.007 (0.011)
age	-0.003 (0.010)	0.000 (0.000)	-0.007 (0.010)	-0.002 (0.004)	-0.005 (0.008)	-0.003 (0.010)	0.000 (0.000)	-0.007 (0.010)	-0.002 (0.003)	-0.006 (0.008)
age_square	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
gender	-0.062** (0.030)	-0.000 (0.000)	-0.068** (0.028)	0.016 (0.012)	0.039 (0.025)	-0.055* (0.039)	-0.000 (0.000)	-0.062** (0.030)	0.016 (0.012)	0.036 (0.024)
elementary	0.095** (0.039)	0.119 (0.022)	0.089** (0.036)	-0.071** (0.031)	0.035 (0.039)	0.090** (0.039)	0.154 (0.242)	0.084** (0.037)	-0.070** (0.012)	0.040 (0.039)
junior	0.077* (0.041)	0.000 (0.000)	0.051 (0.039)	-0.061** (0.028)	0.078* (0.040)	0.069* (0.041)	0.000 (0.000)	0.043 (0.039)	-0.060** (0.028)	0.084** (0.040)
high	0.183*** (0.042)	0.610 (0.591)	0.151*** (0.040)	-0.094** (0.043)	0.059 (0.050)	0.172*** (0.043)	0.672 (0.520)	0.142*** (0.041)	-0.091** (0.041)	0.067 (0.051)
university	0.045 (0.053)	0.345 (0.621)	0.012 (0.052)	-0.113** (0.051)	0.058 (0.056)	0.040 (0.053)	0.423 (0.618)	0.007 (0.052)	-0.112** (0.051)	0.064 (0.057)
healthy	0.021 (0.043)	0.000 (0.000)	0.044 (0.042)	-0.001 (0.015)	-0.008 (0.037)	0.020 (0.043)	0.000 (0.000)	0.042 (0.042)	0.000 (0.015)	-0.004 (0.036)
married	0.046 (0.052)	0.000 (0.000)	0.071 (0.051)	0.020 (0.025)	0.073* (0.039)	0.036 (0.051)	0.000 (0.000)	0.064 (0.051)	0.019 (0.024)	0.075* (0.039)
employment	0.057 (0.044)	0.000 (0.000)	0.077* (0.043)	0.014 (0.018)	0.033 (0.034)	0.062 (0.044)	0.000 (0.000)	0.081* (0.043)	0.013 (0.018)	0.031 (0.034)
pension	0.030 (0.034)	-0.000 (0.000)	0.039 (0.032)	0.004 (0.013)	-0.019 (0.028)	0.036 (0.034)	-0.000 (0.000)	0.044 (0.032)	0.004 (0.013)	-0.020 (0.028)
health_ins	0.066 (0.062)	0.000 (0.000)	-0.004 (0.056)	0.061 (0.040)	0.082** (0.037)	0.060 (0.061)	0.000 (0.000)	-0.008 (0.055)	0.063 (0.041)	0.083** (0.037)
num_chil	-0.022 (0.022)	0.000 (0.000)	-0.019 (0.021)	-0.007 (0.010)	-0.000 (0.019)	-0.021 (0.022)	0.000 (0.000)	-0.018 (0.021)	-0.006 (0.010)	0.001 (0.019)

*(Continued)*

Table A3. (Continued).

	(1) own_safe	(2) own_risk	(3) own_financial	(4) own_housing	(5) own_otherhousing	(6) own_safe	(7) own_risk	(8) own_financial	(9) own_housing	(10) own_otherhousing
age_oldest_child	-0.035* (0.019)	0.000 (0.000)	-0.043** (0.018)	-0.005 (0.007)	0.002 (0.016)	-0.036* (0.019)	0.000 (0.000)	-0.044** (0.018)	-0.005 (0.007)	0.001 (0.016)
boy_ratio	0.048 (0.035)	0.000 (0.000)	0.040 (0.034)	-0.004 (0.013)	-0.025 (0.029)	0.047 (0.035)	0.000 (0.000)	0.039 (0.034)	-0.004 (0.013)	-0.025 (0.029)
Observations	1,057	1,057	1,057	1,057	1,057	1,057	1,057	1,057	1,057	1,057

Notes: Robust Standard errors in parentheses.  
\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table A4.** The households whose children will start college within 5 years subsample (Tobit).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio
plan_college	-0.037 (0.031)	0.463* (0.262)	-0.031 (0.021)	0.048* (0.029)	0.164* (0.094)	-0.034 (0.031)	-0.155 (0.149)	-0.022 (0.016)	-0.026 (0.025)	-0.032 (0.072)
plan_abroad										
income	-0.003 (0.002)	0.028** (0.011)	0.006*** (0.002)	0.001 (0.002)	0.018*** (0.007)	-0.003 (0.002)	0.029** (0.012)	0.006*** (0.002)	0.001 (0.002)	0.018*** (0.007)
net_wealth	-0.000*** (0.000)	0.001*** (0.000)	-0.000 (0.000)	0.000** (0.000)	0.001** (0.000)	-0.000*** (0.000)	0.002*** (0.000)	-0.000 (0.000)	0.000** (0.000)	0.001** (0.000)
family_size	0.018** (0.008)	-0.292*** (0.070)	-0.000 (0.008)	-0.007 (0.009)	0.016 (0.024)	0.019** (0.008)	-0.291*** (0.071)	-0.000 (0.008)	-0.007 (0.009)	0.016 (0.024)
age	0.007 (0.008)	0.044 (0.057)	-0.001 (0.005)	0.005 (0.006)	-0.002 (0.020)	0.008 (0.020)	0.039 (0.057)	-0.001 (0.005)	0.005 (0.006)	-0.003 (0.020)
age_square	-0.000 (0.000)	-0.000 (0.001)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.001)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
gender	0.016 (0.024)	-0.240* (0.130)	-0.031** (0.015)	-0.005 (0.021)	0.077 (0.062)	0.018 (0.024)	-0.262** (0.133)	-0.028* (0.015)	-0.008 (0.021)	0.066 (0.062)
elementary	0.001 (0.036)	2.526*** (0.305)	0.072*** (0.020)	-0.057** (0.027)	0.054 (0.092)	0.001 (0.036)	2.574*** (0.304)	0.070** (0.020)	-0.052* (0.027)	0.068 (0.092)
junior	0.016 (0.036)	-3.740* (2.256)	0.057*** (0.021)	-0.060** (0.027)	0.177** (0.090)	0.013 (0.036)	-4.074* (2.356)	0.054*** (0.021)	-0.053** (0.027)	0.195** (0.090)
high	0.017 (0.043)	2.951*** (0.338)	0.088*** (0.024)	-0.033 (0.036)	0.160 (0.106)	0.010 (0.043)	3.000*** (0.319)	0.082*** (0.024)	-0.025 (0.036)	0.184* (0.106)
university	0.060 (0.048)	2.416*** (0.324)	0.025 (0.028)	-0.033 (0.041)	0.139 (0.119)	0.058 (0.048)	2.493*** (0.307)	0.023 (0.028)	-0.028 (0.041)	0.155 (0.118)
healthy	0.016 (0.032)	0.140 (0.264)	0.008 (0.022)	0.010 (0.028)	0.033 (0.087)	0.015 (0.032)	0.152 (0.260)	0.008 (0.022)	0.014 (0.028)	0.042 (0.088)
married	-0.032 (0.035)	0.339* (0.197)	-0.010 (0.029)	0.057 (0.036)	0.182 (0.122)	-0.036 (0.035)	0.336* (0.203)	-0.014 (0.029)	0.060* (0.036)	0.194 (0.122)
employment	-0.045 (0.029)	0.768*** (0.246)	0.025 (0.021)	-0.079*** (0.029)	-0.001 (0.089)	-0.044 (0.029)	0.724*** (0.236)	0.026 (0.021)	-0.081*** (0.029)	-0.009 (0.089)
pension	-0.029 (0.029)	-0.053 (0.168)	0.017 (0.015)	-0.002 (0.023)	-0.039 (0.070)	-0.027 (0.029)	-0.065 (0.168)	0.018 (0.016)	-0.003 (0.023)	-0.039 (0.070)
health_ins	0.075 (0.063)	0.253 (0.287)	-0.054 (0.036)	0.066 (0.050)	0.246* (0.139)	0.074 (0.062)	0.235 (0.291)	-0.056 (0.036)	0.069 (0.050)	0.250* (0.140)
num_chil	-0.025 (0.016)	0.246* (0.129)	-0.013 (0.012)	-0.011 (0.016)	-0.006 (0.045)	-0.024 (0.016)	0.251* (0.132)	-0.013 (0.012)	-0.009 (0.016)	-0.002 (0.045)

(Continued)

Table A4. (Continued).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio
age_oldest_child	-0.024 (0.015)	0.039 (0.086)	-0.017* (0.009)	0.010 (0.012)	0.018 (0.038)	-0.023 (0.015)	0.021 (0.086)	-0.016* (0.009)	0.010 (0.012)	0.017 (0.038)
boy_ratio	0.005 (0.027)	0.197 (0.165)	0.011 (0.017)	-0.002 (0.024)	-0.059 (0.072)	0.003 (0.027)	0.201 (0.170)	0.010 (0.017)	-0.002 (0.024)	-0.063 (0.072)
Constant	0.952*** (0.304)	-6.815*** (2.165)	0.334* (0.178)	0.284 (0.236)	-1.641** (0.727)	0.913*** (0.307)	-5.973*** (1.987)	0.309* (0.175)	0.326 (0.236)	-1.483** (0.719)
Observations	760	760	1,055	1,055	1,055	760	760	1,055	1,055	1,055

Notes: Robust standard errors in parentheses  
\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table A5.** The excepted year more than 5 subsamples (Probit).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	own_safe	own_risk	own_financial	own_housing	own_otherhousing	own_safe	own_risk	own_financial	own_housing	own_otherhousing
plan_college	-0.000 (0.022)	0.020*** (0.004)	-0.001 (0.021)	-0.012 (0.007)	0.034* (0.020)	-0.002 (0.017)	0.021*** (0.006)	0.006 (0.016)	-0.012 (0.007)	0.009 (0.015)
plan_abroad						0.010*** (0.002)	0.000* (0.000)	0.011*** (0.002)	-0.000** (0.000)	0.007*** (0.000)
income	0.010*** (0.002)	0.000 (0.000)	0.011*** (0.002)	-0.000** (0.000)	0.007*** (0.002)	0.001*** (0.002)	0.000* (0.000)	0.001*** (0.002)	0.001*** (0.000)	0.001*** (0.000)
net_wealth	0.001*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.000** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
family_size	-0.017*** (0.006)	-0.006*** (0.002)	-0.020*** (0.005)	0.019*** (0.003)	0.015*** (0.005)	-0.017*** (0.006)	-0.006*** (0.002)	-0.020*** (0.005)	0.019*** (0.003)	0.015*** (0.005)
age	-0.016*** (0.004)	-0.001 (0.001)	-0.015*** (0.004)	0.006*** (0.002)	0.002 (0.003)	-0.016*** (0.004)	-0.001 (0.001)	-0.015*** (0.004)	0.006*** (0.002)	0.002 (0.003)
age_square	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)
gender	0.011 (0.015)	-0.006 (0.005)	0.006 (0.015)	0.005 (0.006)	0.008 (0.014)	0.011 (0.015)	-0.006 (0.005)	0.006 (0.015)	0.005 (0.006)	0.007 (0.014)
elementary	0.067*** (0.021)	-0.004 (0.009)	0.061*** (0.020)	-0.020 (0.013)	0.032 (0.022)	0.067*** (0.021)	-0.004 (0.009)	0.061*** (0.020)	-0.021 (0.013)	0.033 (0.022)
junior	0.075*** (0.021)	0.012 (0.010)	0.062*** (0.019)	-0.037*** (0.012)	0.038* (0.021)	0.075*** (0.021)	0.013 (0.010)	0.062*** (0.019)	-0.038*** (0.012)	0.040* (0.021)
high	0.071*** (0.024)	0.092*** (0.022)	0.049** (0.023)	-0.044*** (0.016)	0.056** (0.025)	0.071*** (0.024)	0.098*** (0.023)	0.049** (0.023)	-0.045*** (0.016)	0.060** (0.025)
university	0.078*** (0.025)	0.106*** (0.025)	0.048** (0.024)	-0.065*** (0.019)	0.061** (0.028)	0.078*** (0.025)	0.108*** (0.026)	0.048** (0.024)	-0.066*** (0.019)	0.064** (0.028)
healthy	0.007 (0.021)	0.003 (0.006)	0.016 (0.020)	0.005 (0.009)	0.029 (0.018)	0.007 (0.021)	0.003 (0.006)	0.016 (0.020)	0.004 (0.009)	0.030* (0.018)
married	0.038 (0.028)	0.015*** (0.005)	0.022 (0.026)	-0.019** (0.008)	0.017 (0.017)	0.038 (0.028)	0.015*** (0.006)	0.022 (0.026)	-0.019** (0.008)	0.017 (0.024)
employment	0.021 (0.019)	-0.005 (0.006)	0.019 (0.018)	0.003 (0.007)	0.014 (0.016)	0.021 (0.019)	-0.006 (0.006)	0.019 (0.018)	0.004 (0.007)	0.013 (0.016)
pension	0.002 (0.017)	0.010** (0.005)	0.010 (0.016)	0.019*** (0.006)	0.018 (0.014)	0.002 (0.017)	0.011** (0.005)	0.010 (0.016)	0.018*** (0.006)	0.020 (0.014)
health_ins	0.076** (0.031)	0.002 (0.009)	0.058** (0.030)	0.019 (0.014)	0.000 (0.027)	0.076** (0.031)	0.004 (0.009)	0.058** (0.030)	0.019 (0.009)	0.001 (0.027)
num_chil	0.004 (0.013)	-0.004 (0.005)	0.010 (0.012)	-0.013** (0.006)	0.002 (0.011)	0.004 (0.013)	-0.005 (0.005)	0.009 (0.012)	-0.012** (0.005)	0.002 (0.011)

(Continued)

Table A5. (Continued).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	own_safe	own_risk	own_financial	own_housing	own_otherhousing	own_safe	own_risk	own_financial	own_housing	own_otherhousing
age_oldest_child	0.005** (0.002)	0.001 (0.001)	0.004* (0.002)	0.001 (0.001)	0.001 (0.002)	0.005** (0.002)	0.001* (0.001)	0.004* (0.002)	0.001 (0.001)	0.001 (0.002)
boy_ratio	-0.003 (0.016)	0.003 (0.004)	0.004 (0.015)	-0.013** (0.006)	-0.039*** (0.014)	-0.003 (0.016)	0.002 (0.005)	0.004 (0.015)	-0.013** (0.006)	-0.039*** (0.014)
Observations	4,211	4,211	4,211	4,211	4,211	4,211	4,211	4,211	4,211	4,211

Notes: Robust standard errors in parentheses  
\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table A6.** The excepted year more than 5 subsamples (Tobit).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio
plan_college	-0.024 (0.018)	0.354** (0.150)	0.001 (0.012)	0.016 (0.017)	0.123** (0.051)	-0.030** (0.014)	0.201*** (0.053)	0.004 (0.008)	-0.011 (0.012)	0.043 (0.034)
plan_abroad										
income	-0.000 (0.000)	0.002 (0.001)	0.000 (0.000)	0.000 (0.000)	0.002 (0.001)	-0.000 (0.000)	0.002 (0.001)	0.000 (0.000)	0.000 (0.000)	0.002 (0.001)
net_wealth	-0.000** (0.000)	0.001*** (0.000)	-0.000 (0.000)	0.000** (0.000)	0.001*** (0.000)	-0.000** (0.000)	0.001*** (0.000)	-0.000 (0.000)	0.000** (0.000)	0.001*** (0.000)
family_size	0.004 (0.004)	-0.087*** (0.026)	-0.015*** (0.003)	0.015*** (0.004)	0.037*** (0.011)	0.004 (0.004)	-0.085*** (0.026)	-0.015*** (0.003)	0.015*** (0.004)	0.037*** (0.011)
age	-0.003 (0.003)	-0.013 (0.013)	-0.008*** (0.002)	0.013*** (0.003)	0.005 (0.007)	-0.003 (0.003)	-0.011 (0.013)	-0.008*** (0.002)	0.013*** (0.003)	0.005 (0.007)
age_square	0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)
gender	-0.004 (0.012)	-0.078 (0.057)	-0.002 (0.008)	-0.019* (0.011)	0.024 (0.031)	-0.003 (0.012)	-0.083 (0.057)	-0.002 (0.011)	-0.019* (0.015)	0.023 (0.031)
elementary	-0.005 (0.019)	-0.044 (0.137)	0.028** (0.011)	0.019 (0.015)	0.093* (0.049)	-0.007 (0.020)	-0.031 (0.136)	0.028** (0.011)	0.019 (0.015)	0.100** (0.049)
junior	-0.005 (0.018)	0.124 (0.114)	0.050*** (0.011)	-0.007 (0.015)	0.129*** (0.047)	-0.006 (0.018)	0.131 (0.113)	0.050*** (0.011)	-0.006 (0.015)	0.135*** (0.047)
high	-0.031 (0.021)	0.608*** (0.110)	0.052*** (0.013)	0.026 (0.018)	0.204*** (0.053)	-0.032 (0.021)	0.620*** (0.109)	0.052*** (0.012)	0.028 (0.018)	0.217*** (0.053)
university	-0.008 (0.022)	0.655*** (0.110)	0.062*** (0.015)	0.018 (0.020)	0.221*** (0.056)	-0.009 (0.022)	0.657*** (0.109)	0.062*** (0.015)	0.020 (0.020)	0.230*** (0.056)
healthy	-0.014 (0.016)	0.027 (0.088)	0.021** (0.010)	0.003 (0.015)	0.074* (0.043)	-0.016 (0.016)	0.030 (0.086)	0.021** (0.010)	0.003 (0.015)	0.077* (0.043)
married	0.028 (0.023)	0.331** (0.136)	0.022 (0.014)	-0.041** (0.019)	0.046 (0.060)	0.029 (0.023)	0.314** (0.137)	0.022 (0.014)	-0.040** (0.019)	0.047 (0.060)
employment	0.012 (0.016)	-0.062 (0.070)	-0.013 (0.010)	-0.060*** (0.014)	-0.008 (0.039)	0.012 (0.016)	-0.064 (0.069)	-0.013 (0.010)	-0.060*** (0.014)	-0.013 (0.039)
pension	-0.017 (0.013)	0.106* (0.061)	0.004 (0.008)	0.011 (0.012)	0.058* (0.033)	-0.017 (0.013)	0.105* (0.060)	0.004 (0.008)	0.011 (0.012)	0.062* (0.033)
health_ins	0.030 (0.027)	-0.005 (0.125)	0.012 (0.017)	-0.012 (0.025)	0.010 (0.063)	0.030 (0.027)	0.009 (0.124)	0.012 (0.017)	-0.011 (0.025)	0.012 (0.063)
num_chil	-0.010 (0.010)	-0.026 (0.060)	0.002 (0.006)	-0.026*** (0.009)	-0.010 (0.025)	-0.008 (0.011)	-0.037 (0.060)	0.002 (0.006)	-0.026*** (0.009)	-0.011 (0.025)

(Continued)

Table A6. (Continued).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio
age_oldest_child	-0.000 (0.002)	0.009 (0.008)	0.002** (0.001)	0.000 (0.002)	-0.003 (0.004)	-0.000 (0.002)	0.010 (0.008)	0.002** (0.001)	0.000 (0.002)	-0.004 (0.004)
boy_ratio	-0.005 (0.013)	0.024 (0.058)	0.024*** (0.008)	-0.026** (0.012)	-0.103*** (0.033)	-0.005 (0.013)	0.010 (0.058)	0.024*** (0.008)	-0.026** (0.012)	-0.101*** (0.033)
Constant	0.880*** (0.078)	-1.590*** (0.394)	0.229*** (0.048)	0.269*** (0.073)	-1.284*** (0.196)	0.870*** (0.077)	-1.358*** (0.378)	0.229*** (0.047)	0.284*** (0.071)	-1.204*** (0.193)
Observations	3,042	3,042	4,201	4,201	4,201	3,042	3,042	4,201	4,201	4,201

Notes: Robust standard errors in parentheses  
\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.





Table A7. Robustness check of probit model (Using total number of children).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	own_safe	own_risk	own_financial	own_housing	own_otherhousing	own_safe	own_risk	own_financial	own_housing	own_otherhousing
total_plan_college	-0.005 (0.011)	0.016*** (0.006)	-0.006 (0.010)	-0.010* (0.005)	0.031*** (0.010)	-0.003 (0.011)	0.010*** (0.003)	0.005 (0.011)	-0.009** (0.004)	-0.000 (0.010)
total_plan_abroad										
income	0.011*** (0.002)	0.000* (0.000)	0.013*** (0.002)	-0.000** (0.000)	0.006*** (0.002)	0.011*** (0.002)	0.000* (0.000)	0.013*** (0.002)	-0.000** (0.000)	0.006*** (0.000)
net_wealth	0.000*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
family_size	-0.013** (0.005)	-0.006*** (0.002)	-0.016*** (0.005)	0.018*** (0.005)	0.014*** (0.004)	-0.013** (0.005)	-0.007*** (0.002)	-0.016*** (0.005)	0.018*** (0.005)	0.014*** (0.004)
age	-0.016*** (0.003)	-0.000 (0.001)	-0.016*** (0.003)	0.006*** (0.002)	0.002 (0.003)	-0.016*** (0.003)	-0.000 (0.001)	-0.016*** (0.003)	0.006*** (0.002)	0.002 (0.003)
age_square	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)
gender	-0.004 (0.014)	-0.006* (0.004)	-0.010 (0.013)	0.007 (0.005)	0.013 (0.012)	-0.004 (0.014)	-0.007* (0.004)	-0.009 (0.013)	0.008 (0.005)	0.012 (0.012)
elementary	0.073*** (0.019)	0.003 (0.008)	0.068*** (0.017)	-0.029** (0.013)	0.032* (0.019)	0.073*** (0.019)	0.005 (0.009)	0.067*** (0.017)	-0.030** (0.013)	0.036* (0.019)
junior	0.077*** (0.018)	0.010 (0.008)	0.061*** (0.017)	-0.041*** (0.013)	0.046** (0.019)	0.076*** (0.018)	0.012 (0.009)	0.061*** (0.017)	-0.042*** (0.014)	0.050*** (0.019)
high	0.090*** (0.021)	0.097*** (0.021)	0.067*** (0.020)	-0.051*** (0.016)	0.056* (0.022)	0.089*** (0.021)	0.107*** (0.022)	0.066*** (0.020)	-0.054*** (0.016)	0.063*** (0.023)
university	0.076*** (0.022)	0.097*** (0.023)	0.046** (0.022)	-0.074*** (0.019)	0.058** (0.025)	0.075*** (0.022)	0.105*** (0.023)	0.045** (0.022)	-0.076*** (0.019)	0.065*** (0.025)
healthy	0.009 (0.019)	0.003 (0.005)	0.021 (0.018)	0.004 (0.008)	0.025 (0.016)	0.009 (0.019)	0.004 (0.005)	0.021 (0.018)	0.003 (0.009)	0.025 (0.016)
married	0.042* (0.025)	0.013*** (0.004)	0.036 (0.024)	-0.014 (0.008)	0.027 (0.021)	0.041* (0.025)	0.013*** (0.004)	0.035 (0.024)	-0.014* (0.008)	0.030 (0.020)
employment	0.029* (0.018)	-0.001 (0.004)	0.029* (0.017)	0.005 (0.007)	0.015 (0.015)	0.030* (0.018)	-0.002 (0.005)	0.030* (0.017)	0.005 (0.005)	0.013 (0.015)
pension	0.010 (0.015)	0.008** (0.004)	0.019 (0.014)	0.017** (0.008)	0.011 (0.013)	0.010 (0.015)	0.008** (0.004)	0.019 (0.014)	0.017* (0.009)	0.012 (0.013)
health_ins	0.074*** (0.028)	0.003 (0.007)	0.044* (0.026)	0.028** (0.014)	0.016 (0.023)	0.073*** (0.028)	0.004 (0.007)	0.044* (0.026)	0.028* (0.014)	0.018 (0.023)
num_chil	0.000 (0.013)	-0.016** (0.007)	0.007 (0.012)	-0.004 (0.007)	-0.021* (0.012)	-0.003 (0.011)	-0.005 (0.004)	0.002 (0.010)	-0.010 (0.006)	0.001 (0.010)

(Continued)

Table A7. (Continued).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	own_safe	own_risk	own_financial	own_housing	own_otherhousing	own_safe	own_risk	own_financial	own_housing	own_otherhousing
age_oldest_child	0.004** (0.002)	-0.000 (0.000)	0.003** (0.001)	0.001 (0.001)	0.000 (0.001)	0.004** (0.002)	0.000 (0.000)	0.003** (0.001)	0.001 (0.001)	0.000 (0.001)
boy_ratio	0.007 (0.015)	0.002 (0.004)	0.011 (0.014)	-0.011* (0.007)	-0.035*** (0.013)	0.007 (0.015)	0.002 (0.004)	0.011 (0.014)	-0.011* (0.007)	-0.035*** (0.013)
Observations	5,268	5,268	5,268	5,268	5,268	5,268	5,268	5,268	5,268	5,268

Notes: Robust standard errors in parentheses  
\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table A8.** Robustness check of tobit model (Using total number of children).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio
total_plan_college	-0.007 (0.009)	0.226** (0.108)	-0.003 (0.006)	0.016** (0.008)	0.087** (0.025)	-0.013 (0.009)	0.145** (0.040)	-0.000 (0.005)	-0.010 (0.008)	0.012 (0.022)
total_plan_abroad										
income	-0.000 (0.000)	0.002* (0.001)	0.001 (0.000)	0.000 (0.000)	0.002 (0.001)	-0.000 (0.000)	0.003* (0.001)	0.001 (0.000)	0.000 (0.000)	0.002 (0.002)
net_wealth	-0.000*** (0.000)	0.001*** (0.000)	-0.000* (0.000)	0.000*** (0.000)	0.001*** (0.000)	-0.000*** (0.000)	0.001*** (0.000)	-0.000* (0.000)	0.000*** (0.000)	0.001*** (0.000)
family_size	0.007* (0.004)	-0.102*** (0.025)	-0.012*** (0.003)	0.012*** (0.004)	0.035*** (0.010)	0.007* (0.004)	-0.101*** (0.025)	-0.012*** (0.003)	0.012*** (0.004)	0.035*** (0.010)
age	-0.002 (0.003)	-0.003 (0.013)	-0.008*** (0.002)	0.013*** (0.004)	0.006 (0.007)	-0.002 (0.003)	-0.002 (0.012)	-0.008*** (0.002)	0.012*** (0.002)	0.006 (0.007)
age_square	0.000 (0.000)	0.000 (0.000)	0.000** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)
gender	0.001 (0.011)	-0.097* (0.053)	-0.008 (0.007)	-0.015 (0.010)	0.032 (0.028)	0.002 (0.011)	-0.105** (0.053)	-0.008 (0.007)	-0.016 (0.010)	0.030 (0.028)
elementary	-0.004 (0.017)	0.043 (0.124)	0.038*** (0.010)	0.003 (0.013)	0.086** (0.043)	-0.005 (0.017)	0.057 (0.123)	0.037*** (0.010)	0.004 (0.013)	0.094** (0.043)
junior	-0.001 (0.016)	0.116 (0.113)	0.053*** (0.010)	-0.019 (0.013)	0.137*** (0.042)	-0.002 (0.016)	0.131 (0.111)	0.052*** (0.010)	-0.017 (0.013)	0.148*** (0.042)
high	-0.025 (0.019)	0.690*** (0.106)	0.060*** (0.011)	0.013 (0.016)	0.198*** (0.047)	-0.025 (0.019)	0.711*** (0.104)	0.059*** (0.011)	0.017 (0.016)	0.218*** (0.047)
university	-0.000 (0.020)	0.682*** (0.107)	0.060*** (0.013)	0.006 (0.018)	0.211*** (0.050)	-0.001 (0.020)	0.693*** (0.106)	0.060*** (0.013)	0.009 (0.018)	0.227*** (0.050)
healthy	-0.011 (0.015)	0.034 (0.083)	0.019** (0.009)	0.006 (0.013)	0.071* (0.039)	-0.012 (0.015)	0.041 (0.082)	0.019** (0.009)	0.006 (0.013)	0.073* (0.039)
married	0.014 (0.020)	0.301** (0.124)	0.017 (0.013)	-0.021 (0.017)	0.072 (0.054)	0.014 (0.020)	0.305** (0.125)	0.017 (0.012)	-0.019 (0.017)	0.079 (0.054)
employment	0.003 (0.014)	-0.035 (0.067)	-0.007 (0.009)	-0.064*** (0.013)	-0.012 (0.035)	0.003 (0.014)	-0.032 (0.066)	-0.007 (0.009)	-0.064*** (0.013)	-0.017 (0.036)
pension	-0.019* (0.012)	0.099* (0.057)	0.008 (0.007)	0.008 (0.011)	0.042 (0.030)	-0.019 (0.012)	0.094* (0.056)	0.008 (0.007)	0.009 (0.011)	0.045 (0.030)
health_ins	0.041 (0.025)	0.008 (0.119)	0.000 (0.015)	0.001 (0.022)	0.045 (0.058)	0.040 (0.022)	0.024 (0.118)	0.000 (0.015)	0.002 (0.022)	0.051 (0.058)
num_chil	-0.007 (0.011)	-0.221* (0.126)	-0.000 (0.007)	-0.036*** (0.009)	-0.078*** (0.029)	-0.009 (0.009)	-0.060 (0.058)	-0.002 (0.006)	-0.023*** (0.008)	-0.017 (0.023)

*(Continued)*

Table A8. (Continued).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio
age_oldest_child	-0.000 (0.001)	-0.003 (0.006)	0.001* (0.001)	0.001 (0.001)	-0.002 (0.003)	-0.000 (0.001)	-0.002 (0.006)	0.001* (0.001)	0.001 (0.001)	-0.002 (0.003)
boy_ratio	-0.004 (0.012)	0.038 (0.055)	0.022*** (0.007)	-0.023** (0.011)	-0.094*** (0.030)	-0.004 (0.012)	0.029 (0.054)	0.022*** (0.007)	-0.022** (0.011)	-0.093*** (0.030)
Constant	0.833*** (0.070)	-1.455*** (0.365)	0.237*** (0.043)	0.274*** (0.065)	-1.242*** (0.177)	0.835*** (0.070)	-1.517*** (0.363)	0.237*** (0.043)	0.273*** (0.065)	-1.258*** (0.177)
Observations	3,802	3,802	5,256	5,256	5,256	3,802	3,802	5,256	5,256	5,256

Notes: Robust standard errors in parentheses  
\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table A9.** Robustness check of probit model (Put the college and abroad together).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	own_safe	own_risk	own_financial	own_housing	own_otherhousing	own_safe	own_risk	own_financial	own_housing	own_otherhousing
plan_college	-0.019 (0.020)	0.016*** (0.004)	-0.016 (0.018)	-0.007 (0.007)	0.037*** (0.017)	-0.005 (0.011)	0.015** (0.006)	-0.007 (0.010)	-0.009* (0.005)	0.031*** (0.011)
plan_abroad	-0.013 (0.016)	0.013*** (0.004)	-0.001 (0.015)	-0.013* (0.007)	0.002 (0.014)	-0.002 (0.011)	0.009*** (0.003)	0.005 (0.011)	-0.008* (0.004)	-0.003 (0.010)
total_plan_college						0.011*** (0.002)	0.000* (0.000)	0.013*** (0.002)	-0.000** (0.000)	0.006*** (0.002)
total_plan_abroad						0.000*** (0.000)	0.000** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
income	-0.013*** (0.005)	-0.006*** (0.002)	-0.016*** (0.005)	0.017*** (0.004)	0.014*** (0.004)	-0.013** (0.005)	-0.006*** (0.002)	-0.016*** (0.005)	0.018*** (0.005)	0.014*** (0.004)
net_wealth	-0.016*** (0.003)	-0.000 (0.001)	-0.016*** (0.003)	0.006*** (0.002)	0.002 (0.003)	-0.016*** (0.003)	-0.000 (0.001)	-0.015*** (0.003)	0.006*** (0.002)	0.002 (0.003)
family size	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)
age	-0.004 (0.014)	-0.007* (0.004)	-0.010 (0.013)	0.007 (0.005)	0.013 (0.012)	-0.004 (0.014)	-0.007* (0.004)	-0.010 (0.013)	0.007 (0.005)	0.013 (0.012)
age_square	0.073*** (0.019)	0.004 (0.008)	0.068*** (0.017)	-0.030** (0.013)	0.034* (0.019)	0.073*** (0.019)	0.004 (0.008)	0.068*** (0.017)	-0.029** (0.013)	0.032* (0.019)
gender	0.077*** (0.018)	0.011 (0.009)	0.061*** (0.017)	-0.042*** (0.012)	0.048** (0.019)	0.077*** (0.018)	0.010 (0.008)	0.061*** (0.017)	-0.041*** (0.013)	0.046** (0.019)
junior	0.091*** (0.021)	0.100*** (0.022)	0.068*** (0.020)	-0.053*** (0.016)	0.058*** (0.022)	0.090*** (0.021)	0.097*** (0.021)	0.067*** (0.021)	-0.051*** (0.016)	0.056** (0.022)
high	0.076*** (0.022)	0.098*** (0.023)	0.046** (0.022)	-0.075*** (0.018)	0.061** (0.025)	0.076*** (0.022)	0.096*** (0.023)	0.046** (0.022)	-0.074*** (0.019)	0.058*** (0.025)
university	0.009 (0.019)	0.003 (0.005)	0.021 (0.018)	0.004 (0.008)	0.024 (0.016)	0.009 (0.019)	0.003 (0.005)	0.021 (0.018)	0.004 (0.008)	0.025 (0.016)
healthy	0.042* (0.025)	0.013*** (0.004)	0.036 (0.024)	-0.013* (0.008)	0.029 (0.020)	0.042* (0.025)	0.012*** (0.004)	0.036 (0.024)	-0.013 (0.008)	0.027 (0.021)
married	0.029* (0.018)	-0.001 (0.004)	0.029* (0.017)	0.005 (0.007)	0.015 (0.015)	0.029* (0.018)	-0.001 (0.004)	0.029* (0.017)	0.005 (0.007)	0.015 (0.015)
employment	0.010 (0.015)	0.008** (0.004)	0.019 (0.014)	0.017** (0.007)	0.011 (0.013)	0.010 (0.015)	0.007** (0.004)	0.019 (0.014)	0.017** (0.008)	0.011 (0.013)

(Continued)

Table A9. (Continued).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	own_safe	own_risk	own_financial	own_housing	own_otherhousing	own_safe	own_risk	own_financial	own_housing	own_otherhousing
health_ins	0.074*** (0.028)	0.004 (0.007)	0.044* (0.026)	0.028** (0.014)	0.017 (0.023)	0.074*** (0.028)	0.004 (0.006)	0.044* (0.026)	0.028** (0.014)	0.016 (0.023)
num_chil	-0.002 (0.011)	-0.003 (0.004)	0.003 (0.010)	-0.011* (0.005)	0.001 (0.010)	0.000 (0.013)	-0.018** (0.007)	0.006 (0.012)	-0.003 (0.007)	-0.021* (0.012)
age_oldest_child	0.004** (0.002)	0.000 (0.000)	0.003** (0.001)	0.001 (0.001)	0.000 (0.001)	0.004** (0.002)	0.000 (0.000)	0.003** (0.001)	0.001 (0.001)	0.000 (0.001)
boy_ratio	0.008 (0.015)	0.002 (0.004)	0.012 (0.014)	-0.011* (0.006)	-0.036*** (0.013)	0.007 (0.015)	0.002 (0.003)	0.011 (0.014)	-0.011* (0.007)	-0.035*** (0.013)
Observations	5,268	5,268	5,268	5,268	5,268	5,268	5,268	5,268	5,268	5,268

Notes: Robust standard errors in parentheses  
\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table A10.** Robustness check of tobit model (Put the college and abroad together).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio
plan_college_any	-0.024 (0.016)	0.345** (0.135)	-0.006 (0.135)	0.026* (0.014)	0.133** (0.045)					
plan_abroad_any	-0.029** (0.013)	0.171*** (0.051)	0.001 (0.007)	-0.017 (0.011)	0.023 (0.031)					
total_plan_college										
total_plan_abroad										
income	-0.000	0.002*	0.001 (0.000)	0.000	0.002 (0.001)	-0.005 (0.009)	0.208* (0.109)	-0.003 (0.006)	0.018** (0.008)	0.087*** (0.026)
net_wealth	-0.000***	0.001***	-0.000*	0.000***	0.001***	-0.013 (0.009)	0.137*** (0.045)	0.000 (0.005)	-0.012 (0.008)	0.003 (0.022)
family_size	0.007*	-0.102***	-0.012***	0.012***	0.035***	-0.000***	0.002* (0.001)	0.001 (0.000)	0.000 (0.000)	0.002 (0.001)
age	-0.002	-0.002	-0.008***	0.012***	0.006 (0.007)	-0.002 (0.004)	-0.002 (0.025)	-0.008*** (0.003)	0.012*** (0.004)	0.006 (0.010)
age_square	0.000	0.000	0.000**	-0.000***	-0.000	0.000	0.000 (0.000)	0.000*** (0.002)	-0.000*** (0.000)	-0.000 (0.007)
gender	0.002	-0.101*	-0.008 (0.007)	-0.015 (0.010)	0.033 (0.028)	0.002 (0.011)	-0.101* (0.053)	-0.008 (0.007)	-0.015 (0.010)	0.032 (0.028)
elementary	-0.004	0.051 (0.124)	0.038*** (0.010)	0.003 (0.013)	0.088** (0.043)	-0.004 (0.017)	0.052 (0.124)	0.038*** (0.010)	0.002 (0.013)	0.086** (0.043)
junior	-0.000	0.128 (0.112)	0.053*** (0.010)	-0.019 (0.013)	0.141*** (0.042)	-0.001 (0.016)	0.122 (0.113)	0.053*** (0.010)	-0.019 (0.013)	0.137*** (0.042)
high	-0.022	0.691***	0.060***	0.014 (0.016)	0.201*** (0.047)	-0.024 (0.019)	0.689*** (0.106)	0.060*** (0.011)	0.013 (0.016)	0.198*** (0.047)
university	0.002	0.673***	0.060***	0.007 (0.018)	0.214*** (0.050)	0.000 (0.020)	0.674*** (0.107)	0.060*** (0.013)	0.006 (0.018)	0.211*** (0.050)
healthy	-0.010	0.028 (0.082)	0.020** (0.009)	0.005 (0.013)	0.069* (0.039)	-0.011 (0.015)	0.031 (0.082)	0.019** (0.009)	0.005 (0.013)	0.071* (0.039)
married	0.015	0.305** (0.125)	0.017 (0.012)	-0.020 (0.017)	0.076 (0.054)	0.015 (0.020)	0.301** (0.126)	0.017 (0.013)	-0.021 (0.017)	0.072 (0.054)
employment	0.002	-0.031 (0.067)	-0.007 (0.009)	-0.063*** (0.013)	-0.013 (0.036)	0.003 (0.014)	-0.027 (0.066)	-0.007 (0.009)	-0.064*** (0.013)	-0.012 (0.035)
pension	-0.019 (0.012)	0.092 (0.056)	0.008 (0.007)	0.009 (0.011)	0.042 (0.030)	-0.019 (0.012)	0.091 (0.056)	0.008 (0.007)	0.009 (0.011)	0.042 (0.030)

*(Continued)*

Table A10. (Continued).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio	safe_ratio	risk_ratio	financial_ratio	housing_ratio	otherhousing_ratio
health_ins	0.040 (0.025)	0.029 (0.118)	0.000 (0.015)	0.002 (0.022)	0.050 (0.058)	0.041 (0.025)	0.025 (0.118)	0.000 (0.015)	0.001 (0.022)	0.045 (0.058)
num_chil	-0.010 (0.009)	-0.029 (0.055)	-0.002 (0.005)	-0.024*** (0.008)	-0.016 (0.022)	-0.006 (0.011)	-0.243* (0.129)	-0.000 (0.007)	-0.035*** (0.009)	-0.078*** (0.029)
age_oldest_child	-0.000 (0.001)	-0.001 (0.006)	0.001* (0.001)	0.001 (0.001)	-0.002 (0.003)	-0.000 (0.001)	-0.001 (0.006)	0.001* (0.001)	0.001 (0.001)	-0.002 (0.003)
boy_ratio	-0.003 (0.012)	0.029 (0.055)	0.022*** (0.007)	-0.023** (0.011)	-0.096*** (0.030)	-0.004 (0.012)	0.030 (0.054)	0.022*** (0.007)	-0.022** (0.011)	-0.094*** (0.030)
Constant	0.857*** (0.070)	-1.857*** (0.376)	0.241*** (0.044)	0.258*** (0.066)	-1.363*** (0.181)	0.834*** (0.070)	-1.488*** (0.366)	0.237*** (0.043)	0.276*** (0.065)	-1.243*** (0.177)
Observations	3,802	3,802	5,256	5,256	5,256	3,802	3,802	5,256	5,256	5,256

Notes: Robust standard errors in parentheses  
\*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.