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**Working Paper**

# Early life conditions and financial risk-taking in older age

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CFS WORKING PAPER

No. 2011/28

# Early Life Conditions and Financial Risk–Taking in Older Age

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# Early Life Conditions and Financial Risk–Taking in Older Age*

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September 28, 2011

**Abstract:**
Using life-history survey data from eleven European countries, we investigate whether childhood conditions, such as socioeconomic status, cognitive abilities and health problems influence portfolio choice and risk attitudes later in life. After controlling for the corresponding conditions in adulthood, we find that superior cognitive skills in childhood (especially mathematical abilities) are positively associated with stock and mutual fund ownership. Childhood socioeconomic status, as indicated by the number of rooms and by having at least some books in the house during childhood, is also positively associated with the ownership of stocks, mutual funds and individual retirement accounts, as well as with the willingness to take financial risks. On the other hand, less risky assets like bonds are not affected by early childhood conditions. We find only weak effects of childhood health problems on portfolio choice in adulthood. Finally, favorable childhood conditions affect the transition in and out of risky asset ownership, both by making divesting less likely and by facilitating investing (i.e., transitioning from non-ownership to ownership).

**JEL Classification:** G11, D14, E21, J13, C23, C25

**Keywords:** Portfolio Choice, Childhood, Socioeconomic Status, Cognition, Health, Financial Risk

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## 1. Introduction

Why so many households do not invest in risky financial assets? This puzzle has been preoccupying economists for many years (Haliassos and Bertaut, 1995; see also the contributions in Guiso, Haliassos, and Jappelli, 2001, for cross-country evidence on this issue). The overwhelming majority of the investigations of this puzzle have examined factors that are present in adulthood. We propose to study this puzzle from a different angle that has not yet been explored in the literature.[1] Specifically, we go back in time and examine the effect of childhood conditions on portfolio decisions and risk preferences in adulthood.

We find that risky asset ownership in older age, as well as the willingness to undertake financial risk, is strongly and positively associated with childhood socioeconomic status (SES) and childhood cognition. On the other hand, the influence of health problems early in life seems to be weaker. Crucially, these results are obtained while controlling for SES and cognition in adulthood (including education, wealth, income, and health) in a variety of ways. This indicates the existence of direct and longstanding (possibly permanent) effects of childhood conditions on economic choices and attitudes later in life.

There are several channels through which childhood experiences could affect financial decisions in adulthood. First, childhood conditions have direct implications for wealth latter in life, which is in turn strongly associated with risky asset ownership. Oftentimes, an early life of deprivation has a negative effect on childhood health. Poor childhood health adversely affects cognition and wealth accumulation in adulthood, thus leading to the perpetuation of

[1] There are several papers that investigate how socioeconomic status in adulthood affects portfolio decisions. For example, individuals with higher education, income and wealth hold a larger fraction of their financial wealth in stocks (McArdle, Smith and Willis, 2009). Cognitive skills are also found to influence portfolio decisions in older age, as these decisions may be cognitively demanding (Christelis, Jappelli and Padula, 2010; Jappelli and Padula, 2011). In addition, the household finance literature has examined the influence of health on portfolio choice (Rosen and Wu, 2004, Edwards, 2008; Yogo, 2009; Coile and Milligan, 2006) as well as that of age, with portfolios in retirement exhibiting reduced risk (Guiso, Haliassos and Jappelli, 2001; Ameriks and Zeldes, 2004).

poverty (Palloni, 2006), the persistence of which across generations is well documented.[2] More generally, there is substantial evidence that the intergenerational correlation in incomes is high (Solon, 1992)[3]. The same is true for the intergenerational correlation in wealth, as documented by Charles and Hurst (2003), who also find that adults who have wealthy living parents are more likely to invest in risky assets like stocks.

Second, childhood conditions affect individuals' stock of human capital. The benefits of positive early childhood experiences (as indicated by height) extend to the old age, as taller individuals enjoy better physical and mental health when they are old (Case and Paxson, 2008a). Furthermore, using height as a marker for lifelong experiences, Korniotis and Kumar (2010) find that taller individuals are more likely to participate in financial markets, and when they do so, they also hold riskier financial portfolios. Case, Fertig and Paxton (2005) find that being born in a low SES family has a negative impact on childhood health, lowers investments in human capital and worsen health in early adulthood, all effects associated with lower adult earnings. Hanushek and Woessmann (2008) survey the voluminous evidence on the strong positive association between childhood cognition and adult earnings. Hence, health or cognitive problems in childhood are likely to put people at a disadvantage when they start their working lives. With diminished human capital, individuals will experience a lower lifetime income, with direct implications for portfolio choice.

Third, early life experiences may affect portfolio choice by shaping the attitude toward risk. For instance, a difficult childhood may lead to higher risk aversion in adulthood. Results from Hryshko, Luengo-Prado and Sorensen (2010) suggest that attitudes such as risk aversion are partly shaped by childhood SES. They find that besides age, gender, religion, and parents'

[2] Further evidence on the positive effect of health and socioeconomic status early in life on their counterparts in adulthood is given by Currie (2009), and Luo and Waite (2005).
[3] Shore (2011) shows that there is also a considerable intergenerational transmission of income volatility.

risk aversion, a higher level of parental education makes children less risk averse in adulthood, which should lead to riskier portfolio allocations.

Fourth, childhood conditions may affect the rate of return of capital. For example, early cognitive skills are likely to have a direct impact on the level of financial sophistication later in life. Indeed, Lusardi, Mitchell and Curto (2010), find that the financial literacy of young adults in the US is strongly positively associated with their test scores in high school, as well as with the wealth of their parents. Furthermore, the household finance literature has long recognized that financial sophistication affects saving and portfolio decisions (see e.g. Lusardi and Mitchell, 2007; Behrman, Mitchell and Bravo, 2010). Van Rooij, Lusardi and Alessie (2011) find that financial literacy is associated with higher probability to invest in the stock market and with greater wealth. Calvet, Campbell and Sodini (2009) construct an index of financial sophistication and show that poor financial sophistication explains a set of investment mistakes, which include under-diversification, inertia in the risky share of the portfolio, and the tendency to sell winning stocks and hold losing stocks. Finally, Christelis, Jappelli and Padula (2010) find that the propensity to invest in stocks is strongly associated with cognitive abilities.

Fifth, childhood conditions may affect the type of uncertainties that an individual will have to face during adulthood. Having certain medical conditions early in life can lower life expectancy and lead to higher and more volatile health spending. On the other hand, low cognitive abilities and childhood SES can reduce the chances of finding and keeping a job, thus leading to a less stable working life trajectory. In fact, Brandt and Hank (2011), using the same data as we do, find a strong positive association of childhood SES and health with income uncertainty in adulthood, as indicated by the prevalence of unemployment spells. As a result, increased exposure to risk in one dimension may lead people to reduce risks in other dimensions, for instance by increasing saving for precautionary reasons or by reducing

investment in risky assets like stocks. Empirical evidence for the former effect was provided by Caroll and Samwick (1997), who documented that individuals exposed to higher income uncertainty systematically accumulate more wealth. Furthermore, Guiso, Jappelli and Terlizzese (1996) and Heaton and Lucas (2000) find that in the presence of other independent risks, investors reduce the exposure to rate-of-return risks, lowering the proportion of wealth in illiquid and risky assets (especially stocks).

In order to study the effects of childhood conditions on adult portfolio choice and risk attitudes we use micro-survey data that provide information on both current and retrospective conditions of people aged fifty and above in eleven European countries. We examine several questions related to childhood conditions that provide information on early health and SES, as well as on childhood cognitive skills. In addition, we also retrieve from our micro data information on asset choices and risk attitudes in adulthood, and thus can examine how they are linked to the early life conditions.

From a methodological point of view, the paper extends the literature on portfolio allocation by estimating the transition probabilities in and out of ownership for different financial assets. Our findings indicate that higher childhood SES and cognition make it less likely that households will sell their risky assets, and more likely that they will invest in them if they don't already own them.

To the best of our knowledge, the association between childhood conditions and financial risk taking has been previously investigated only in a short piece by Christelis, Dobrescu and Motta (2011, henceforth CDM). They study the effect of childhood conditions on the decision to ever own risky financial assets in the past, at any point in life, even for a short period. Such ownership, however, can be due to chance (e.g. because of a received inheritance or gift), or to an impulsive decision that could be soon reversed. In this paper, on the other hand, we study a quite different outcome, namely risky-asset ownership in older age

(more than 50 years) as recorded in two different survey waves that are about two years apart. Therefore, these ownership decisions are more likely to be the outcome of deliberate thought and planning, and thus less likely to be influenced by transient factors. Furthermore, the longer time distance between the outcomes examined in this paper and childhood provides a more stringent test of the continuing relevance of childhood conditions for adulthood. Finally, we improve on CDM by: i) adding and separately examining bonds, individual retirement accounts (IRAs) and whole life insurance as asset choices, as well as by combining all risky financial assets in a single outcome; ii) using much richer specifications in our estimating equations; iii) exploiting the panel nature of the data (CDM pool the two survey waves); iv) allowing for the temporal dependence of the error terms, which, as already mentioned, allows us to examine transitions in asset ownership; v) performing numerous checks to verify the robustness of our results to factors such as survivorship bias.

The structure of the paper is as follows: Section 2 describes the data, while Section 3 discusses our estimation methodology. Our baseline results are presented in Section 4, while several robustness checks are performed in Section 5. Section 6 concludes.

## 2. Data

We use data from the first two waves of the Survey of Health, Ageing, and Retirement in Europe (SHARE), which took place in 2004-5 and 2006-7 in eleven European countries (Sweden, Denmark, Germany, the Netherlands, Belgium, France, Switzerland, Austria, Italy, Spain and Greece).[4] SHARE surveys those aged fifty and above and collects data on demographics, physical and mental health (including the administration of tests like grip

[4] The second wave took place also in the Czech Republic, Poland, and Ireland, but given that we need to work with the two-wave panel data we do not use the information from these countries.

strength), cognition, social activities, housing, employment, income, housing, assets and expectations.[5]

In 2008-9 SHARE conducted its third wave (SHARELIFE), which was different from the first two ones because it mostly collected retrospective information on respondents' lives, starting from childhood and arriving to the present. The questions covered, among other things, the respondents' physical and mental health histories, early cognition, accommodation, working histories, and children and partner information.[6]

In SHARELIFE one can glean information on the SES in childhood through a few questions. We use two of them: i) a question on the number of rooms (excluding kitchen, bathrooms, and hallways) in the accommodation that the respondent's family lived in when the respondent was ten years old; ii) a question on the number of books that could be found in the house when the respondent was ten years old. There are five possible answers to this question, expressed in the following ranges: 0-10, 11-25, 26-100, 101-200, more than 200. As there are very few respondents that give answers that lie above the second range, we create a binary variable that takes the value of one if the answer is above the first range, and zero otherwise.

In order to get information on the respondents' cognitive abilities during childhood we use two SHARELIFE questions that ask about their performance at school at age ten, relative to their schoolmates, in mathematics and language. There are five possible answers to each of the two questions (the performance was much better, better, about the same, worse, much worse). We create two binary variables that take the value of one if the respondents were much better or better, and zero otherwise.

[5] More detailed information on waves 1 and 2 of SHARE can be found in Börsch-Supan *et al*. (2005), Börsch-Supan and Jürges (2005), Börsch-Supan *et al*. (2008).
[6] More details on SHARELIFE can be found in Börsch-Supan *et al*. (2011).

There are several questions in SHARELIFE that provide information on health during childhood. After experimenting with a number of them[7], we finally chose for our baseline empirical specification to construct an indicator of health problems in childhood that equals one if respondents spent one or more months in the hospital or went to the hospital three or more times in one month during childhood.

Given that SHARELIFE is a retrospective survey, it would be natural to ponder how reliable are respondents' recollections about life events that took place many years back. The issue has been examined by Havari and Mazzona (2011, henceforth HM), who find that self-reported health and chronic diseases in childhood are not associated with cognitive and recall capacities in adulthood, and are also congruent with measures of health in adulthood. Furthermore, measures of childhood SES, when aggregated across countries, correlate very strongly with historical country macroeconomic magnitudes like GDP per capita. Finally, HM report that measures of childhood cognitive abilities are strongly associated with educational attainment, which is what one would expect. All in all, the findings in HM suggest that SHARELIFE retrospective data are of reasonably good quality, which seems to be a feature of answers to retrospective questions found in other surveys as well.[8]

Following Christelis, Jappelli and Padula (2010), in all our household-level specifications the childhood variables were aggregated over the two partners in a couple, i.e., we took the maximum of the SES, cognition, and health problems variables over the two partners. When one of the two partners had a missing value in any of these variables we used the value of the responding partner. We will test the robustness of our results to this treatment of missing values in Section 5.

[7] More details on variables denoting childhood health are given in Section 5.

[8] HM report evidence to that effect from several other surveys, including the Health and Retirement Study and the Panel Study of Income Dynamics.

In order to assess the impact of childhood SES, cognition, and health on portfolio choice and risk taking in adulthood we chose to study the ownership of five financial assets, for which information can be found in both waves 1 and 2: directly held stocks, mutual funds, IRAs, bonds, and whole life insurance.[9] Households can invest in stocks, which constitute the riskiest financial asset, through four of these five investment vehicles (i.e. with the exception of bonds), and the degree of riskiness should be typically higher for directly held stocks than for IRAs and whole life insurance.

In addition, financial respondents in wave 2 were asked about their risk preferences with respect to their investments. There were four possible answers that reported on whether respondents had the propensity to: i) take substantial financial risks expecting to earn substantial returns; ii) take above average financial risks expecting to earn above average returns; iii) take average financial risks expecting to earn average returns; iv) not take any financial risks. As there were few respondents that chose the first three options, we created a binary variable that was equal to one if the household was willing to take any financial risk, and zero otherwise. Given that the question about financial risk-taking was asked only in wave 2, we could only perform a cross-sectional analysis when modelling the associated variable. On the other hand, when using it as a forcing variable in the equations for the ownership of the five aforementioned assets, we assumed that its value in wave 1 was equal to the one in wave 2. Given the well-established importance of risk preferences in the study of portfolio choice, we preferred this solution to one that would involve discarding any risk preference information in our panel data analysis of asset ownership.

[9] A whole life insurance policy is a policy that has a saving component that accumulates value over time, and thus can be (partly) invested in risky financial assets.

After merging the SHARELIFE data with those for waves 1 and 2 we ended up with a sample of 18,885 households and 29,322 individuals.[10] Information on the prevalence of the ownership of the five financial assets and of the propensity to take any financial risk can be found in Table 1. We note that the highest prevalence of stockholding can be found in Sweden (47%), and the lowest in Greece (4.8%). These two countries represent the two extremes also in the case of mutual funds (53.6% and 1.7%, respectively). Individual retirement accounts are also very prevalent in Sweden (45%), while Italy and Greece display the lowest prevalence (roughly 1.7%). Bond ownership is most widespread in Denmark, Germany and Switzerland (roughly 21%) and least common in Greece (1.4%). In the case of whole life insurance, Sweden is once more the country exhibiting the highest penetration of this financial product (37.5%), and Greece again exhibits the lowest (4.2%).

With respect to our childhood-related variables of interest, we note that the countries with the highest prevalence of more than ten books in the house are Sweden and Denmark (85% and 83%, respectively), while the lowest prevalence can be found in Italy (32%). The largest average number of rooms in the house at age ten can be found in Belgium (5.7), while the lowest in Greece (2.9). The two questions on early cognition show that Swedes and Danes are the most likely (at about 57%) to perform above average in both mathematics and language, while the Greeks are the least likely (roughly 34%). It is notable that in most countries the majority of respondents report being below average or at most average compared to their schoolmates, especially in math but also in language. This suggests that our measures of childhood cognition are unlikely to suffer from biases due to overestimation of one's ability. Finally, Austrians and Germans are the most likely to have spent one or more months in the hospital (16% and 15.2% respectively), while Greeks the least likely (roughly 1%).

[10] We use Release 2.4 of the wave 1 and 2 data, and Release 1.0 of the SHARELIFE data.

## 3. Econometric model

The main objective of our empirical strategy is to estimate, in a panel data setting, the effects of our forcing variables on the ownership of different financial assets, as well as on the transitions in and out of ownership. To that effect we use the semi-parametric discrete choice panel data model with autocorrelation developed in Christelis and Fonseca (2011).[11] For the willingness to assume some financial risk we will use a probit model, as the estimation is performed on a cross-section.

Transitions of discrete choice outcomes are often estimated by starting with a sample of respondents in which the outcome takes one value in the start of the panel, and then examining what happens in subsequent waves: a new binary variable is defined to be equal to one if there is a change to the other outcome in any of those waves, while it is equal to zero if there is no change. There are a couple of problems with this approach. First, it starts with a potentially very selected sample that consists of those for which the outcome takes a particular value. For example, in order to study transitions out of stock ownership one would start with a sample of those that were stock owners in the first wave of the panel. Selectivity can be a problem because the unobservables that affect the decision to be a stockholder (e.g. familiarity with the workings of the stock market) might also affect the transition out of stock ownership. In other words, only part of the sample is used, and the truncation is based on an endogenous decision, which can lead to inconsistent estimates. Second, this approach cannot handle the opposite transitions (in our example, from non-ownership to ownership) as separate events, as the transition is defined only for going from ownership to non-ownership. Therefore the case of the opposite transition would take the same value as the case of no transition, i.e., zero.

[11] The exposition in this section follows closely their arguments.

Another approach would be to model simultaneously the two ownership possibilities, each with two possible outcomes (no transition and transition), by using a multinomial logit with four total outcomes. Some of the outcomes, however, would be irrelevant (and thus impossible to choose) for some cases of ownership. For example, transitions from ownership to non-ownership would be irrelevant for non-owners. The inability to choose some of the alternatives at any given point in time would be a violation of the assumptions of the multinomial logit. Alternatively, one could use a nested logit, but one of the assumptions in such a model would be that unobservables of the choices in different nests are uncorrelated with each other, an assumption that is difficult to justify in our context.

Our approach to the problem of estimating transitions starts from the specification of the household's decision problem, namely to own the asset or not. For this decision we posit an equation for a latent variable $y^*_{i,t}$ (for household *i*) given by

$$y^*_{i,t} = \mathbf{X}_{i,t}\boldsymbol{\beta} + c_k + \varepsilon_t \qquad (1)$$

where $\mathbf{X}_{i,t}$ denotes a vector of control variables, $c_k$ a random effect, and $\varepsilon_t$ is a time varying noise term. As usual, there is an observed binary variable $y_{i,t}$ that is equal to one if the latent variable $y^*_{i,t}$ is greater than zero, and is equal to zero otherwise.

We assume that the random effect $c_k$ takes values from a distribution with K points (the first point $c_1$ is normalized to zero as in Michaud and Tatsiramos, 2011), and for each point *k* (*k*=1,…, K) there is an associated probability $p_k$. In other words, we estimate a non-parametric distribution for the random effect, as in Heckman and Singer (1984). The use of a non-parametric distribution for the random effects should make our results more robust than those obtained under the typical assumption that the random effect is normally distributed

(Mroz, 1999). We choose the optimal number of distribution points in each case by examining the value of the Akaike information criterion, which balances the value of the likelihood against the number of parameters used in the estimation.

The distribution of the noise term $\varepsilon_t$ is of particular importance for our purposes. More specifically, we assume that it is autocorrelated, with correlation coefficient $\rho$, i.e.,

$$\varepsilon_t = \rho\varepsilon_{t-1} + w_t \tag{2}$$

with $w \sim N(0, \sigma^2)$. We allow for the autocorrelation of the noise term because there might be unobservable factors affecting portfolio choice that are not independent over time. For example, some investors might be familiar with the stock market because they are acquainted with people professionally involved in it that provide them with stock tips. Such a source of information can be reasonably assumed to be present in more than one time period.

It is quite important to model the random effects separately from the noise terms for yet another reason: if one merged the random effect $c_k$ with the noise term $\varepsilon_t$ to produce a composite time-varying error term, this latter term would have a component (the random effect $c_k$) with an autocorrelation equal to one, and this could in practice limit the range of values that the autocorrelation coefficient of the composite error term would take. Therefore, modelling separately the random effects and the noise terms makes our model more flexible.

Equation (2) and the distributional assumption on $w$ imply that $\varepsilon_t$ is normally distributed with mean zero and variance equal to $\sigma^2/(1-\rho^2)$. As usual in a probit, we need a normalization in the distribution of the error term $\varepsilon_t$. Consequently, we divide the linear index of the latent variable by the standard deviation of $\varepsilon_t$, which is equal to $\sigma/\sqrt{1-\rho^2}$, and set $\sigma = 1$. This in turn means that the linear index $\boldsymbol{X}_{i,t}\boldsymbol{\beta}$ and the random effect $c_k$ in the

likelihood function will be multiplied by $\sqrt{1-\rho^2}$ .

All the above imply that the probability of observing any combination of the two possible choices (one decision in each of the two periods in our sample) can be written, for a given point $c_k$ of the distribution of the random effects, as follows:

$$h(\mathbf{y}_i \mid \mathbf{X}_i, c_k; \boldsymbol{\beta}, \rho) = \Phi_2\left(l_{i,t}(\mathbf{X}_{i,t}\boldsymbol{\beta} + c_k)\sqrt{1-\rho^2}, l_{i,t+1}(\mathbf{X}_{i,t+1}\boldsymbol{\beta} + c_k)\sqrt{1-\rho^2}, l_{i,t}l_{i,t+1}\rho\right) \quad (3)$$

where $\mathbf{y}_i = (y_{i,t}, y_{i,t+1})$, $\mathbf{X}_i = (\mathbf{X}_{i,t}, \mathbf{X}_{i,t+1})$, $l_{i,t} = 2y_{i,t} - 1$, $l_{i,t+1} = 2y_{i,t+1} - 1$, and $\Phi_2$ denotes the bivariate cumulative standard normal distribution. Hence, the log likelihood of our sample can be written as

$$\log L(\boldsymbol{\beta}, \rho, \mathbf{c}, \mathbf{p}) = \sum_{i=1}^{N}\left(\log \sum_{k=1}^{K} p_k \left[h(\mathbf{y}_i \mid \mathbf{X}_i, c_k; \boldsymbol{\beta}, \rho)\right]\right) \quad (4)$$

where $\boldsymbol{c} = (c_2, \dots, c_K)$ and $\boldsymbol{p} = (p_2, \dots, p_K)$.[12]

The study of transitions in asset ownership between the two periods comes naturally out of this setup if we consider that a transition probability is just a probability of an outcome at *t+1* conditional on an outcome at *t*, and hence is equal to the joint probability of the two outcomes divided by the marginal probability of the conditioning outcome at time *t*. The existence of $\rho$ implies that the joint probability is not equal to the product of the marginal probabilities of the two outcomes; as a result, the conditional probability will not collapse to the marginal probability of the outcome at *t+1*.

Starting from (3), we can calculate the probability of transitioning from ownership of an

[12] More details on the maximization of the likelihood with respect to $\rho$ and $\boldsymbol{p}$ are given in Appendix A.1.

asset at time *t* to non-ownership at time *t+1* as follows:

$$prob(y_{t+1} = 0 \mid y_t = 1) = \sum_{k=1}^{K} p_k \frac{\Phi_2\left((\mathbf{X}_{i,t}\boldsymbol{\beta} + c_k)\sqrt{1-\rho^2}, -(\mathbf{X}_{i,t+1}\boldsymbol{\beta} + c_k)\sqrt{1-\rho^2}, -\rho\right)}{\Phi\left((\mathbf{X}_{i,t}\boldsymbol{\beta} + c_k)\sqrt{1-\rho^2}\right)} \quad (5)$$

i.e., by dividing the joint probability of ownership at *t* and non-ownership at *t+1* by the marginal probability of ownership at t, and integrating the resulting conditional probability over the distribution of the random effect.

Equation (5) makes it clear that we can form the joint probabilities needed to calculate transition probabilities only because of the presence of $\rho$. If $\rho$ were equal to zero, the conditional probability in (5) would collapse to the marginal probability of the outcome at *t+1* for any value of the random effect $c_k$. Similarly, the transition from non-ownership in *t* to ownership in *t+1* is given by

$$prob(y_{t+1} = 1 \mid y_t = 0) = \sum_{k=1}^{K} p_k \frac{\Phi_2\left(-(\mathbf{X}_{i,t}\boldsymbol{\beta} + c_k)\sqrt{1-\rho^2}, (\mathbf{X}_{i,t+1}\boldsymbol{\beta} + c_k)\sqrt{1-\rho^2}, -\rho\right)}{\Phi\left(-(\mathbf{X}_{i,t}\boldsymbol{\beta} + c_k)\sqrt{1-\rho^2}\right)} \quad (6)$$

Let us also emphasize that conditional probabilities like the ones shown in (5) and (6) do not require an outcome defined as a transition; instead, they are naturally derived from the combinations of the static outcomes by taking advantage of the presence of autocorrelation in the noise term. In addition, the calculation of these transition probabilities does not require the presence of a lagged dependent variable, which would not be possible in our case because we have a two-period panel.[13]

[13] It is important to note that the calculation of transition probabilities and of their associated marginal effects is a partly counterfactual exercise, as is also the case with the usual unconditional (i.e., marginal) probabilities. When we consider the probability of, say, direct stockholding and how it is affected by a change in the value of

At first glance, it might appear a bit odd that time-invariant factors like early life conditions might induce a change in behaviour from one period to the next. The channels through which the influence of childhood circumstances materializes are, however, the same ones that are relevant for the static asset ownership choice. For example, the higher stock of human capital and wealth in older age that are associated with high SES and cognition at childhood can bring about the circumstances that trigger financial market participation (Korniotis and Kumar, 2010). In addition, a higher willingness to bear financial risk, partly induced by favourable childhood circumstances, should make divesting from risky assets less likely, thus leading to a more stable and long-run-oriented investment strategy. Finally, higher childhood cognition can increase the level of financial sophistication in adulthood, which in turn can lead to less financial inertia and allocation mistakes, including under-diversification or inappropriate changes in portfolio composition.

As a result of the above, our model allows us to calculate the marginal effects of our variables of interest on the probabilities of: i) ownership (unconditional); ii) transitioning from ownership to non-ownership; iii) transitioning from non-ownership to ownership. When calculating the marginal effects on transition probabilities, we calculate the conditional probability for a given value of the forcing variable in both periods, then calculate the same probability for a second value of the forcing variable (again constant across time) and then take the difference of the two conditional probabilities. For the dummy variables denoting being above average at math and language, for having more than ten books in the house, and for spending one or more months in the hospital, the marginal effects denote the change in the relevant probability when the dummy variable changes from zero to one. For the number of rooms in the house the marginal effect reflects the change in the probability when the

a variable of interest, we calculate this probability also for households that are not observed to own stocks directly in our sample. In a similar fashion, we calculate the probability of a particular transition in the ownership of an asset also for sample units that do not exhibit this ownership pattern over time.

rooms increase by one. We estimate our marginal effects and their standard errors by simulation; the procedure that we follow is described in detail in Appendix A.1.

## 4. Empirical Results

As we have already discussed, we will examine the associations of our five variables of interest denoting childhood SES, cognition, and health. These associations will be expressed as marginal effects on the probabilities of ownership of five assets (stocks, mutual funds, individual retirement accounts, bonds, and whole life insurance), and of the willingness to assume at least some financial risk. In addition, we will examine the marginal effects on the transitions in and out of ownership of the five assets.

In addition to our variables denoting childhood conditions, we will include in our specification several other variables that have been found to be important determinants of risky asset ownership in the household finance literature. These include age, marital status, number of children, the willingness to bear financial risk, education, two cognition indicators (one derived from a numeracy test[14], and another one denoting self-reported good reading skills), real and financial wealth and household income.[15,16] The variables denoting education, numeracy and reading skills, and financial resources are particularly important because they represent SES and cognition in adulthood, and thus whatever effects we find from our childhood conditions variables will be net of the corresponding variables in adulthood. Finally, for the two individual-level outcomes (ownership of IRAs and willingness to bear financial risk) we also add a gender dummy.

[14] See Christelis, Jappelli and Padula (2010).
[15] As is the case for childhood conditions variables, in household-level specifications we aggregate all remaining variables over the couple.
[16] In each specification, the financial wealth variable is net of the value of the asset the ownership of which is modelled. Household income is net of any capital income.

In order to take into account the multi-country variability in our sample we include country dummies. Furthermore, we cluster our errors at the country level, in order to capture the effect of any (possibly time-varying) unobservable factors that affect sample units in a given country.

We first show the regression coefficients for stocks, mutual funds and individual retirement accounts in Table 2a, and for bonds, whole life insurance and the willingness to assume financial risk in Table 2b. Looking at variables other than our five variables of interest, we note that our results are to a very large extent in accordance with both previous findings in the household finance literature and with our intuition: we find strong positive associations of higher education, current cognition, economic resources, and the willingness to take financial risk with all five assets, while the associations with being in bad health are negative. The same patterns are also present in our cross-sectional probit results for the willingness to take financial risk.[17]

One important result that comes out of our estimation is that the autocorrelation coefficient $\rho$ is very large in absolute value and strongly significant for four out of the five assets examined (IRAs are the exception). These results provide a justification for our methodology that allows for autocorrelation in the error terms of our panel model, and uses $\rho$ to calculate probabilities of ownership transitions and the associated marginal effects thereof.

Using the Akaike information criterion, the optimal number of distribution points was found to be two for the case of stocks and whole life insurance, three for bonds, four for mutual funds, and five for IRAs. When estimating our models with different numbers of distribution points, however, we found that, with few exceptions, the marginal effects of our

[17] In our baseline specification for the willingness to take financial risk we omit variables denoting economic resources because there could be reverse causality between them and the attitude towards risk. When we add these variables back, however, our results do not change.

variables of interest did not change between alternative specifications of the non-parametric distribution of the random effect.

It is well known that regression coefficients in non-linear discrete choice models do not allow us to calculate economically relevant magnitudes, and hence we turn our attention to marginal effects. First, we show in Table 3 the marginal effects of our variables of interest on the unconditional (static) probabilities of ownership of the five financial assets and of the willingness to assume financial risk. For stocks, we find that being above average at math is associated with an increase in the probability of ownership by 1 percentage points (pp), while living in a larger house (by one more room) has also a positive effect on stockholding (0.16 pp). Finally, spending time in a hospital during childhood reduces the probability of direct stockownership by 1 pp. Given that about 12% of households in our sample own stocks directly, these results are economically significant.

In the case of mutual funds, the SES variable that matters is having more than ten books in the house (2.3 pp), while being above average at math has once more a strong effect (1.3 pp). The number of books in the house is strongly positively associated with owning IRAs (1.9 pp). Once more, our results for both mutual funds and IRAs are economically important, as ownership prevalence in our sample is about 11% in both cases.

Bonds represent the only assets for which we do not find an association with any of our variables of interest. This finding is not surprising because bonds are the least risky assets that we examine, and thus we would expect the effects of early life conditions to be weak for this particular asset. To put it another way, this finding reinforces our intuition that a crucial channel through which childhood conditions affect adulthood is the willingness to undertake risk.

Whole life insurance ownership, which occurs in about 20% of households, is positively, but weakly, associated with having more than ten books in the house (1.6 pp, p-

value: 0.093), while early cognition plays a role through having above average language skills (1.9 pp). Finally, for the willingness to assume some financial risk, found in about 22% of households, having more than ten books in the house has a strong effect (4.6 pp). We also find a positive association with having above average language skills (0.5 pp).

The analysis of the probability of asset ownership transitions enriches our results by allowing the study of how investors update their choices over time. Consider first the marginal effects (shown in Panel A of Table 4) on the probability of transition from ownership to non-ownership, i.e., of divesting the asset. We find that higher childhood SES and cognition make it less likely that households will want to sell their assets. We note in particular the strong negative effects of being above average at math on divesting from stocks and mutual funds (-1.4 pp and -0.8 pp, respectively), as well as the negative effects of childhood SES (as indicated by having more than ten books in the house) on divesting from mutual funds and individual retirement accounts (-1.4 pp and -1.9 pp, respectively).

Finally, we examine the opposite transition probability, i.e., of investing in the asset in period $t+1$ while not owning it in period $t$. Results are shown in Panel B of Table 4, and we note that childhood cognition and SES are positively associated with investing in risky assets, albeit with somewhat weaker effects (in absolute value) than those found for the divesting probability. Once more, above average mathematical skills are positively associated with investing in stocks (0.9 pp) and in mutual funds (1.5 pp), while above average language skills are associated with investing in whole life insurance (1.7 pp). In addition, having more than ten books in the house has a positive effect on investing in mutual funds (2.6 pp), and on opening an individual retirement account (1.9 pp).

We also experimented with aggregating the different risky asset choices into one, and experimented with two definitions of such a composite choice: i) one that includes direct stocks, mutual funds and IRAs, thus excluding the two assets least likely to reflect financial

risk taking, namely bonds and whole life insurance; ii) one that excludes only bonds.[18] In the first case, we found that having some books in the house increased the probability of ownership by 3.1 pp, while being above average at math increased it by 1.5 pp. In the second case, having some books in the house also increases the ownership probability by 2.8 pp, while we found weaker associations for being above average at language (0.8 pp, p-value 0.093), and for the number of rooms in the house (one more room increases the ownership probability by 0.2 pp, with a p-value of 0.051).[19]

These results are somewhat striking. Typically, individuals are exposed to increasing uncertainty as they age, mostly due to adverse health shocks becoming more severe and frequent, which in turn leads to significant medical expenditure. Increased exposure to risk in one dimension should lead individuals to reduce risks in other dimensions, for instance by reducing investments in risky assets (see Caroll and Samwick, 1997, Guiso, Jappelli and Terlizzese, 1996, and Heaton and Lucas, 2000). In addition, the shorter expected lifetime that comes about with aging, means that there is less time available to recover from an adverse asset price shock. Therefore, it is not surprising that the risky content of household portfolios declines with age (Ameriks and Zeldes, 2004). Our findings suggest that higher SES and cognition in childhood would mitigate this pattern, both by diminishing the propensity to exit from risky investments with age and by increasing, ceteris paribus, the willingness to undertake them.

To summarize, we find that both childhood SES and cognition have economically relevant positive associations with four of the five assets that we examine, and these associations are net of the strong effects of current SES (i.e., education and economic resources), and current cognition. We must also remember that early SES and cognition

[18] Approximately 38% of households in our sample own the composite risky asset as defined in i), while the ownership prevalence of the asset defined in ii) is about 47%.

[19] More detailed results for the composite asset choice are available upon request from the authors.

should have an effect on their current counterparts; therefore, it is very likely that our estimated marginal effects are conservative estimates of the overall effect of childhood cognition and SES on asset ownership and risk taking in older age.

## 5. Robustness checks

We experimented with various specifications of our estimating equations in order to check the robustness of our results. Due to space constraints we cannot show all the results from these checks; they are available from the authors upon request.

We first ran conventional random effects probits without autocorrelation in order to see whether our non-parametric specification of heterogeneity and our modelling of autocorrelation significantly affected our estimates. We found that the results from the random effect probits were very similar to those from our baseline models. We thus conclude that neither the non-parametric specification of the random effect nor the modelling of the autocorrelation in the noise term are likely to introduce biases in our estimation. On the other hand, due to its semi-parametric nature, our model should be more robust to the misspecification of the random effect, while the inclusion of autocorrelation allows the estimation of transition probabilities.

A concern one might have is whether our results are partly due to some non-linearities in the effects of the SES and cognition variables in adulthood that we are not capturing with our baseline specification. Therefore, we re-estimated our models using a more flexible specification that included dummies for quartiles for income, financial and real wealth, as well as a dummy for each value of the numeracy score. The results for static marginal effects are shown in Table 5 (the ones for transitions are shown in Appendix Table A.1), and we note that the effects of our childhood variables are still economically and statistically significant. The only exception is the now weak effect of childhood SES on direct stockholding; on the

other hand the positive association of childhood SES with the ownership of mutual funds and IRAs, and with the willingness to assume financial risk remains strong.

It could also be the case that our results are affected by differential attrition in our sample, as respondents who experienced a higher SES and cognition in childhood might also have a longer life expectancy, and thus be over-represented in our sample. It is not a priori clear what kind of bias this differential attrition might introduce. For example, given that it leads to reduced variability in the childhood SES and cognition variables, it could lead to higher standard errors, and thus to less significant results. In other words, those who were less privileged in childhood need to appear in our sample, so that the effect of more favourable childhood conditions becomes apparent. In order to check the possible consequences of a differential attrition bias, we re-estimated our models including only households in which the maximum age of the two partners (or of the single head) was 65 or less in the first wave of SHARE. This led to a reduced sample of 11,249 households (16,159 individuals). The results from this younger sample are shown in Table 6 (static marginal effects), and in Appendix Table A.2 (effects on transition probabilities). We note that both childhood SES and cognition still have strong associations with risky asset ownership and risk preferences, and thus conclude that our baseline results are unlikely to be due to any differential attrition in our sample.

Ownership of risky financial assets might also be affected by any inheritances or large gifts received, which could be, at least partly, in the form of such assets. As a result, the observed household investment patterns in our sample might not be totally due to deliberate choice (although households can in principle disinvest from any inherited assets if they so wish). It could thus be useful to distinguish the effect of the childhood condition variables from that of any inheritances or gifts received. To that effect, we added to our specification a variable that denotes whether the household has received in the past an inheritance or gift

with a value larger than 5,000 euros (or the equivalent sum for non-euro countries). As the relevant question is asked at the household level[20], we examined its effect at the household-level outcomes, i.e. the ownership of stocks, mutual funds, bonds and whole life insurance.

We found that having received any inheritance/large gift has a very strong positive association with all the investment outcomes that we examined. For example, having received an inheritance increases the probability of direct stock ownership by 3.8 pp, and of mutual fund ownership by 5.5 pp. However, the inclusion of this variable leaves the results of our variables of interest (i.e., the childhood conditions variables) unaffected, with only one exception: in the case of direct stock ownership, the two SES variables (number of books and number of rooms in the house) now become insignificant, although childhood cognition remains strongly associated with direct stock ownership.

However, when one accounts for received inheritances, it is not surprising that the effect of childhood SES could be somewhat weakened. Given that in our data more than 80% of respondents report that they received their inheritances from their parents, such inheritances are in effect another indicator of the SES of someone's family; consequently, they are likely to be highly correlated with childhood SES. Therefore, the inclusion of inheritances in the specification is likely to make the effect of other childhood SES variables weaker, as such an effect would now be net of another variable that significantly overlaps with the childhood SES variables.

We also re-estimated our models without clustering the standard errors at the country level. Such specifications imply that any country-level effects can be dealt with satisfactorily by including country dummies in the conditional mean of the latent variables, as there is no further correlation in the unobservables among units in a given country. While there are some

[20] The question on inheritances/gifts received is asked to the financial respondents in couples and records whether they or their partners received the inheritance/gift. Even though one person in the household needs to answer this question, our estimation sample is reduced by 437 observations due to non-response.

small differences in the significance of some variables, the overall picture remains the same. We thus conclude that our results are not affected in any significant way by the clustering of standard errors at the country level.

Our results up to now indicate that childhood health problems play a very limited role in risky asset ownership later in life (with the exception of direct stockholding), after accounting for current health conditions. In order to check the robustness of this result we experimented with three additional measures of childhood health conditions: self-reported health at childhood, the number of serious diseases experienced, and whether respondents had regular access to medical care until they were sixteen years old. We found that none of these additional variables affected risky asset ownership (including direct stockholding) or risk attitudes. We therefore conclude that childhood health problems are unlikely to have any effect on financial risk taking in older age, after controlling for current health status.

Finally, as we have already noted, in our sample we had a number of couples for which the information on childhood conditions was missing for one of the two partners. Up to now these couples were included in our estimation by using the information of the responding partner. After their exclusion, our samples for household-level outcomes consist of 10,926 observations.[21] In order to see the impact of this decision on our results, we estimated our models after excluding couples with missing values. We found that our overall results did not change, with one exception: SES status, as indicated by the number of rooms in the childhood house, has now a strong positive effect on whole life insurance. Therefore, it seems that ignoring the issue of missing values of the second partner in couples does not change the overall findings that we get from our baseline results.

[21] The issue of missing values in couples is not relevant for the case of IRAs and the willingness to bear financial risk, as these outcomes are modelled at the individual level.

## 6. Conclusions

This paper studies the influence of childhood SES, cognition, and health on financial asset investment and risk preferences in older age. Our results indicate that SES and cognition early in life have a lasting and economically significant effect on both investment choices and risk preferences, even after controlling for current SES and cognition. On the other hand, the effect of childhood health was found to be weaker. These results are robust to a variety of alternative specifications and estimation procedures, and also hold for the younger part of our sample, which indicates that they are not due to differential attrition.

Methodologically, our paper contributes to the household finance literature by showing how to take advantage of the autocorrelation of the noise term in panel data models in order to study asset ownership transitions. Our approach allows us to use the whole sample for our estimation, and hence avoid the selectivity problems that affect estimation in truncated samples.

Our findings point out to early childhood conditions as one potential answer to the puzzle of why so many households do not invest at all in risky financial assets, a behavior that is inconsistent with the predictions of standard models of portfolio choice. It appears that adverse childhood conditions leave permanent effects on individuals' cognitive capacities and risk preferences, making them reluctant to undertake risky financial investments.

Therefore, it is likely that policy interventions early in childhood have, among other things, the potential to increase individuals' ability to enhance their material circumstances in adulthood through the judicious choice of their financial investments. Judging from our results, such interventions should include measures to alleviate conditions associated with low SES such as poverty, as well as measures that aim to improve school performance. Doing better at school should in turn lead to higher financial literacy in adulthood, thus making investment in financial assets less daunting and more attractive.

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# Appendix

## A.1 Calculation of Magnitudes of Interest via Monte Carlo Simulation

The autocorrelation coefficient $\rho$ and the vector of probabilities $\mathbf{p} = (p_2, \dots, p_K)$ must satisfy the following constraints: $\rho$ must lie between minus one and one and $p_2, \dots, p_K$ must lie between zero and one. These constraints make convergence of our already complicated likelihood function even more difficult. Therefore we estimate $\rho$ and $\mathbf{p}$ as functions of the unconstrained parameters $\psi$, and $\boldsymbol{\omega} = (\omega_2, \dots, \omega_K)$, that hence become the ones with respect to which the likelihood function is maximized. The mapping between these new parameters and $\rho$ and $\mathbf{p}$ is as follows:

$$\rho = \frac{e^{\psi} - 1}{e^{\psi} + 1}$$
$$p_k = \frac{e^{\omega_k}}{\sum_{k=1}^{K} e^{\omega_k}} \tag{A.1}$$

with $\omega_1 = 0, k = 1, \dots K$. Given that marginal effects, $\rho$ and $\mathbf{p}$ all represent magnitudes that are nonlinear functions of estimated parameters that are part of $\hat{a} = (\hat{\beta}, \hat{\psi}, \hat{c}_2, \dots, \hat{c}_K, \hat{\omega}_2, \dots, \hat{\omega}_K)$, we compute their point estimates and standard errors via Monte Carlo simulation (Train, 2003), i.e., by using the formula

$$E(g(\theta)) = \int g(\theta) f(\theta) d\theta \tag{A.2}$$

where $\theta$ denotes one or more parameters in $a$, $g(\theta)$ denotes the magnitude of interest and $f(\theta)$ the joint distribution of all the elements in $\theta$. We implement this simulation estimator

by drawing 1,000 times from the joint distribution of the estimated vector of parameters $\hat{a}$ under the assumption that it is asymptotically normal with mean and variance-covariance matrix equal to the maximum likelihood estimates. Then, for a given parameter draw $j$ we generate the magnitude of interest $g(\hat{\theta}^j)$. For marginal effects in particular, we first calculate the partial effect corresponding to each individual in our sample and then calculate the marginal effect $g(\hat{\theta}^j)$ as the weighted average (using sample weights) of the effect across individuals.[22] We then estimate $E(g(\theta))$ and its standard error as the mean and standard deviation, respectively, of the distribution of $g(\hat{\theta}^j)$ over all parameter draws.

[22] We do not evaluate marginal effects at sample means since this practice can lead to severely misleading results (see Train, 2003, pp. 33-34).

**Table 1. Descriptive Statistics**

| Variable | Sweden | Denmark | Germany | Netherlands | Belgium | France | Switzerland | Austria | Italy | Spain | Greece |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Owns stocks** | 0.473 | 0.417 | 0.181 | 0.203 | 0.239 | 0.175 | 0.287 | 0.074 | 0.072 | 0.065 | 0.048 |
| **Owns mutual funds** | 0.536 | 0.178 | 0.182 | 0.151 | 0.201 | 0.197 | 0.234 | 0.071 | 0.062 | 0.053 | 0.017 |
| **Owns IRAs** | 0.450 | 0.375 | 0.106 | 0.041 | 0.272 | 0.289 | 0.180 | 0.067 | 0.016 | 0.112 | 0.017 |
| **Owns bonds** | 0.178 | 0.218 | 0.210 | 0.051 | 0.146 | 0.045 | 0.210 | 0.066 | 0.137 | 0.018 | 0.014 |
| **Owns whole life insurance** | 0.375 | 0.285 | 0.368 | 0.330 | 0.254 | 0.206 | 0.257 | 0.291 | 0.090 | 0.102 | 0.042 |
| **Willing to take some financial risk** | 0.433 | 0.464 | 0.285 | 0.252 | 0.318 | 0.241 | 0.330 | 0.172 | 0.165 | 0.106 | 0.197 |
| **Age (mean)** | 65.0 | 64.3 | 64.9 | 64.1 | 65.2 | 64.2 | 65.3 | 64.5 | 64.9 | 64.6 | 64.2 |
| **Couples** | 0.656 | 0.62 | 0.696 | 0.674 | 0.684 | 0.672 | 0.632 | 0.635 | 0.73 | 0.733 | 0.662 |
| **Number of children (mean)** | 2.23 | 2.17 | 2.03 | 2.33 | 2.14 | 2.21 | 2.05 | 2.09 | 2.03 | 2.33 | 1.86 |
| **Self-reported health bad or very bad** | 0.220 | 0.291 | 0.496 | 0.392 | 0.339 | 0.419 | 0.205 | 0.393 | 0.570 | 0.561 | 0.321 |
| **High school education** | 0.299 | 0.375 | 0.525 | 0.294 | 0.272 | 0.373 | 0.574 | 0.497 | 0.281 | 0.130 | 0.299 |
| **Post-secondary education** | 0.332 | 0.469 | 0.385 | 0.339 | 0.397 | 0.300 | 0.156 | 0.305 | 0.093 | 0.150 | 0.200 |
| **Good reading skills** | 0.936 | 0.883 | 0.762 | 0.715 | 0.842 | 0.783 | 0.858 | 0.862 | 0.557 | 0.486 | 0.685 |
| **Numeracy score (mean)** | 4.037 | 3.964 | 4.004 | 4.083 | 3.756 | 3.603 | 4.087 | 3.906 | 3.261 | 2.977 | 3.751 |
| **Real wealth in euros (median)** | 101,494 | 112,641 | 134,634 | 158,072 | 198,646 | 228,408 | 138,797 | 133,454 | 171,971 | 198,917 | 144,322 |
| **Financial wealth in euros (median)** | 27,680 | 41,139 | 27,369 | 27,710 | 31,704 | 17,074 | 52,142 | 9,832 | 5,607 | 4,420 | 2,577 |
| **Household income in euros (median)** | 37,239 | 33,628 | 32,436 | 36,618 | 27,804 | 33,667 | 37,942 | 29,791 | 21,552 | 20,258 | 18,933 |
| **More than ten books in the house when ten years old** | 0.855 | 0.834 | 0.787 | 0.794 | 0.673 | 0.653 | 0.777 | 0.662 | 0.318 | 0.488 | 0.455 |
| **Number of rooms in the house when ten years old (mean)** | 4.11 | 4.94 | 4.16 | 5.00 | 5.71 | 4.70 | 5.15 | 3.59 | 3.41 | 3.89 | 2.88 |
| **Was better than average at math in school when ten years old** | 0.565 | 0.563 | 0.49 | 0.486 | 0.546 | 0.433 | 0.484 | 0.426 | 0.443 | 0.406 | 0.361 |
| **Was better than average in language in school when ten years old** | 0.574 | 0.605 | 0.525 | 0.446 | 0.574 | 0.515 | 0.534 | 0.488 | 0.397 | 0.36 | 0.328 |
| **Spent time in the hospital during childhood** | 0.123 | 0.133 | 0.152 | 0.133 | 0.079 | 0.077 | 0.109 | 0.164 | 0.049 | 0.055 | 0.011 |
| **Number of households** | 1,798 | 1,766 | 1,485 | 1,708 | 2,644 | 1,991 | 1,078 | 886 | 1,816 | 1,369 | 2,319 |
| **Number of individuals** | 2,912 | 2,705 | 2,378 | 2,735 | 3,981 | 2,904 | 1,648 | 1,262 | 3,015 | 2,238 | 3,544 |

**Table 2a. Estimation Results – Stocks, Mutual Funds, IRAs**

| Variable | Stocks | | | Mutual Funds | | | Individual Retirement Accounts | | |
|---|---|---|---|---|---|---|---|---|---|
| | Coeff. | Std. Error | | Coeff. | Std. Error | | Coeff. | Std. Error | |
| **Age/100** | 0.1255 | 0.3584 | | 0.7342 | 0.6182 | | -7.6442 | 1.3044 | *** |
| **Female** | -..- | -..- | | -..- | -..- | | -0.0776 | 0.0862 | |
| **Is in a couple** | 0.2558 | 0.0519 | *** | 0.1215 | 0.0833 | | 0.0580 | 0.1339 | |
| **Number of children** | -0.0439 | 0.0106 | *** | -0.0624 | 0.0175 | *** | -0.0319 | 0.0175 | * |
| **Self-reported health bad or very bad** | -0.0453 | 0.0472 | | -0.1633 | 0.0516 | *** | -0.1770 | 0.0464 | *** |
| **Willing to take some financial risk** | 0.8994 | 0.0723 | *** | 1.2573 | 0.1078 | *** | 0.6489 | 0.1492 | *** |
| **High school education** | 0.1638 | 0.0410 | *** | 0.2024 | 0.0806 | ** | 0.3034 | 0.0758 | *** |
| **Post-secondary education** | 0.4294 | 0.0839 | *** | 0.5014 | 0.0932 | *** | 0.4426 | 0.1049 | *** |
| **Good reading skills** | 0.1115 | 0.0539 | ** | 0.2439 | 0.1456 | * | 0.0944 | 0.0454 | ** |
| **Numeracy score** | 0.0737 | 0.0220 | *** | 0.0854 | 0.0446 | * | 0.0629 | 0.0245 | ** |
| **Real wealth** | 0.0592 | 0.0076 | *** | 0.0549 | 0.0121 | *** | 0.0602 | 0.0187 | *** |
| **Financial wealth** | 0.0327 | 0.0047 | *** | 0.0444 | 0.0118 | *** | 0.0278 | 0.0086 | *** |
| **Non-capital income** | 0.0303 | 0.0093 | *** | 0.0302 | 0.0174 | * | 0.0290 | 0.0163 | * |
| **Time effect for 2nd wave** | -0.0988 | 0.0673 | | -0.4160 | 0.0888 | *** | 0.3306 | 0.1427 | ** |
| **Country dummy: Denmark** | -0.3685 | 0.0178 | *** | -2.3485 | 0.2032 | *** | -0.7167 | 0.0724 | *** |
| **Country dummy: Germany** | -1.3764 | 0.1061 | *** | -1.9545 | 0.1599 | *** | -2.3712 | 0.3132 | *** |
| **Country dummy: Netherlands** | -1.2079 | 0.0972 | *** | -2.1821 | 0.1791 | *** | -..- | -..- | |
| **Country dummy: Belgium** | -1.1769 | 0.0950 | *** | -2.0407 | 0.1665 | *** | -1.0929 | 0.1516 | *** |
| **Country dummy: France** | -1.2184 | 0.0974 | *** | -1.6908 | 0.1281 | *** | -0.7624 | 0.1119 | *** |
| **Country dummy: Switzerland** | -0.8113 | 0.0599 | *** | -1.7307 | 0.1507 | *** | -1.8004 | 0.2378 | *** |
| **Country dummy: Austria** | -1.8808 | 0.1320 | *** | -2.8852 | 0.2260 | *** | -2.9207 | 0.4068 | *** |
| **Country dummy: Italy** | -1.7750 | 0.1124 | *** | -2.6527 | 0.1913 | *** | -3.8167 | 0.5496 | *** |
| **Country dummy: Spain** | -1.5915 | 0.1141 | *** | -2.8372 | 0.1932 | *** | -1.9348 | 0.2615 | *** |
| **Country dummy: Greece** | -2.0054 | 0.1278 | *** | -3.8584 | 0.2678 | *** | -3.7224 | 0.4642 | *** |
| **More than ten books in the house when ten years old** | 0.0587 | 0.0351 | * | 0.2466 | 0.0867 | *** | 0.1913 | 0.0630 | *** |
| **Number of rooms in the house when ten years old** | 0.0166 | 0.0084 | ** | 0.0163 | 0.0113 | | 0.0053 | 0.0129 | |
| **Was better than average at math in school when ten years old** | 0.1082 | 0.0320 | *** | 0.1339 | 0.0408 | *** | 0.0514 | 0.0377 | |
| **Was better than average in language in school when ten years old** | -0.0445 | 0.0343 | | 0.0755 | 0.0439 | * | -0.0018 | 0.0471 | |
| **Spent time in the hospital during childhood** | -0.1187 | 0.0544 | ** | 0.0930 | 0.0961 | | -0.1755 | 0.1152 | |
| **Constant** | -1.8463 | 0.2886 | *** | -0.4837 | 0.5725 | *** | 1.9538 | 0.9639 | * |
| **ρ** | 0.3307 | 0.0948 | *** | -0.4316 | 0.1000 | *** | -0.3201 | 0.2262 | |
| **Distribution points** | | | | | | | | | |
| **Point 2 value** | -2.0091 | 0.0896 | *** | -4.2875 | 0.3261 | *** | -10.9949 | 3.1129 | *** |
| **Point 2 probability** | 0.6424 | 0.0809 | *** | 0.1940 | 0.0463 | *** | 0.2096 | 0.0335 | *** |
| **Point 3 value** | -..- | -..- | | -2.0208 | 0.1393 | *** | 1.8235 | 0.2866 | *** |
| **Point 3 probability** | -..- | -..- | | 0.7548 | 0.0625 | *** | 0.3391 | 0.0726 | *** |
| **Point 4 value** | -..- | -..- | | 3.8566 | 0.6646 | *** | 4.0411 | 0.8535 | *** |
| **Point 4 probability** | -..- | -..- | | 0.0259 | 0.0141 | * | 0.1572 | 0.0159 | *** |
| **Point 5 value** | -..- | -..- | | -..- | -..- | | 7.0964 | 0.8379 | *** |
| **Point 5 probability** | -..- | -..- | | -..- | -..- | | 0.1478 | 0.0154 | *** |
| **Number of Observations** | 18,885 | | | 18,885 | | | 26,628 | | |
| **Log Likelihood** | -6,946.6 | | | -6,393.7 | | | -9,040.8 | | |

**Notes**: ***, **, * denote significance at 1%, 5% and 10%, respectively.

**Table 2b. Estimation Results – Bonds, Whole Life Insurance, Willingness to Take Some Financial Risk**

| Variable | Bonds | | | Whole Life Insurance | | | Willing to take at least some financial risk | | |
|---|---|---|---|---|---|---|---|---|---|
| | Coeff. | Std. Error | | Coeff. | Std. Error | | Coeff. | Std. Error | |
| **Age/100** | 4.3403 | 1.5550 | *** | -5.2471 | 0.9483 | *** | -0.0138 | 0.0030 | *** |
| **Female** | -..- | -..- | | -..- | -..- | | -0.2591 | 0.0393 | *** |
| **Is in a couple** | 0.1589 | 0.0842 | * | 0.3621 | 0.0599 | *** | 0.2024 | 0.0408 | *** |
| **Number of children** | -0.0935 | 0.0234 | *** | 0.0190 | 0.0111 | * | -0.0265 | 0.0099 | *** |
| **Self-reported health bad or very bad** | -0.1958 | 0.1115 | * | 0.0072 | 0.0433 | | -0.1735 | 0.0217 | *** |
| **Willing to take some financial risk** | 0.8400 | 0.2141 | *** | 0.3042 | 0.0452 | *** | -..- | -..- | |
| **High school education** | 0.4075 | 0.1886 | ** | 0.1346 | 0.0515 | *** | 0.1470 | 0.0511 | *** |
| **Post-secondary education** | 0.7130 | 0.2111 | *** | 0.2620 | 0.0587 | *** | 0.3699 | 0.0819 | *** |
| **Good reading skills** | 0.2733 | 0.1594 | * | 0.1122 | 0.0566 | ** | 0.1036 | 0.0485 | ** |
| **Numeracy score** | 0.1336 | 0.0577 | ** | 0.0420 | 0.0311 | | 0.1277 | 0.0190 | *** |
| **Real wealth** | 0.0691 | 0.0258 | *** | 0.0210 | 0.0064 | *** | -..- | -..- | |
| **Financial wealth** | 0.0697 | 0.0159 | *** | 0.0072 | 0.0028 | ** | -..- | -..- | |
| **Non-capital income** | 0.0095 | 0.0254 | | 0.0082 | 0.0064 | | -..- | -..- | |
| **Time effect for 2nd wave** | -0.2405 | 0.1985 | | 0.1696 | 0.0854 | ** | -..- | -..- | |
| **Country dummy: Denmark** | 0.2046 | 0.0936 | ** | -0.5345 | 0.0300 | *** | 0.0211 | 0.0099 | ** |
| **Country dummy: Germany** | 0.2512 | 0.1583 | | -0.0419 | 0.0177 | ** | -0.3457 | 0.0173 | *** |
| **Country dummy: Netherlands** | -1.8427 | 0.5096 | *** | -0.2317 | 0.0309 | *** | -0.5010 | 0.0137 | *** |
| **Country dummy: Belgium** | -0.5672 | 0.1547 | *** | -0.5370 | 0.0343 | *** | -0.3537 | 0.0170 | *** |
| **Country dummy: France** | -1.9594 | 0.6074 | *** | -0.7172 | 0.0458 | *** | -0.4558 | 0.0113 | *** |
| **Country dummy: Switzerland** | 0.2671 | 0.1429 | * | -0.4697 | 0.0222 | *** | -0.2873 | 0.0151 | *** |
| **Country dummy: Austria** | -1.4422 | 0.4677 | *** | -0.3078 | 0.0281 | *** | -0.7633 | 0.0225 | *** |
| **Country dummy: Italy** | -0.0873 | 0.1006 | | -1.2817 | 0.0650 | *** | -0.6059 | 0.0250 | *** |
| **Country dummy: Spain** | -2.2830 | 0.6792 | *** | -1.1724 | 0.0556 | *** | -0.7490 | 0.0338 | *** |
| **Country dummy: Greece** | -2.7978 | 0.8559 | *** | -1.7793 | 0.0764 | *** | -0.4808 | 0.0219 | *** |
| **More than ten books in the house when ten years old** | 0.0597 | 0.0956 | | 0.0698 | 0.0452 | | 0.1600 | 0.0474 | *** |
| **Number of rooms in the house when ten years old** | 0.0210 | 0.0176 | | 0.0105 | 0.0073 | | 0.0190 | 0.0056 | *** |
| **Was better than average at math in school when ten years old** | 0.0737 | 0.0916 | | -0.0388 | 0.0494 | | 0.0317 | 0.0329 | |
| **Was better than average in language in school when ten years old** | -0.0378 | 0.1010 | | 0.0841 | 0.0232 | *** | 0.0214 | 0.0484 | |
| **Spent time in the hospital during childhood** | -0.1731 | 0.1273 | | -0.0179 | 0.0732 | | 0.0568 | 0.0694 | |
| **Constant** | -6.2289 | 1.6703 | *** | 1.5131 | 0.6117 | * | -0.1554 | 0.2420 | |
| **ρ** | -0.6569 | 0.2017 | *** | 0.4402 | 0.0761 | *** | -..- | -..- | |
| **Distribution points** | | | | | | | | | |
| **Point 2 value** | -2.7645 | 0.7232 | *** | 1.6674 | 0.6557 | ** | -..- | -..- | |
| **Point 2 probability** | 0.7743 | 0.0794 | *** | 0.5335 | 0.0503 | *** | -..- | -..- | |
| **Point 3 value** | 2.2513 | 0.6279 | *** | -..- | -..- | | -..- | -..- | |
| **Point 3 probability** | 0.1283 | 0.0438 | *** | -..- | -..- | | -..- | -..- | |
| **Number of Observations** | 18,885 | | | 18,885 | | | 9,357 | | |
| **Log Likelihood** | -5,556.8 | | | -7,792.2 | | | -5,071.8 | | |

**Notes**: ***, **, * denote significance at 1%, 5% and 10%, respectively.

**Table 3. Unconditional (Static) Marginal Effects, Baseline Model**

| Variable | Stocks | | Mutual Funds | | Individual Retirement Accounts | | Bonds | | Whole Life Insurance | | Willing to take at least some financial risk | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error |
| **More than ten books in the house when ten years old** | 0.0055 | 0.0031 * | 0.0230 | 0.0069 *** | 0.0186 | 0.0076 ** | 0.0036 | 0.0065 | 0.0152 | 0.0106 | 0.0455 | 0.0135 *** |
| **Number of rooms in the house when ten years old** | 0.0016 | 0.0008 ** | 0.0016 | 0.0012 | 0.0004 | 0.0012 | 0.0010 | 0.0010 | 0.0023 | 0.0015 | 0.0054 | 0.0016 *** |
| **Was better than average at math in school when ten years old** | 0.0102 | 0.0031 *** | 0.0132 | 0.0042 *** | 0.0049 | 0.0036 | 0.0044 | 0.0064 | -0.0084 | 0.0111 | 0.0091 | 0.0094 |
| **Was better than average in language in school when ten years old** | -0.0041 | 0.0033 | 0.0075 | 0.0045 * | -0.0004 | 0.0045 | -0.0012 | 0.0056 | 0.0182 | 0.0057 *** | 0.0061 | 0.0138 |
| **Spent time in the hospital during childhood** | -0.0105 | 0.0044 ** | 0.0096 | 0.0099 | -0.0160 | 0.0101 | -0.0072 | 0.0058 | -0.0039 | 0.0159 | 0.0164 | 0.0204 |

**Notes**: Marginal effects denote the change in the relevant choice probability when our variables of interest change as follows: the binary variables denoting having some books in the house, being above average at math and language at school, and spending time in the hospital during childhood change from zero to one, while the continuous variable denoting the numbers of rooms in the house respondents lived in at age ten changes by one unit.***, **, * denote significance at 1%, 5% and 10%, respectively.

**Table 4. Marginal Effects on Ownership Transitions, Baseline Model**

| Variable | Stocks | | Mutual Funds | | Individual Retirement Accounts | | Bonds | | Whole Life Insurance | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error |
| **Panel A. Transition from ownership to non-ownership** | | | | | | | | | | |
| **More than ten books in the house when ten years old** | -0.0075 | 0.0043 * | -0.0137 | 0.0043 *** | -0.0185 | 0.0087 ** | -0.0028 | 0.0056 | -0.0153 | 0.0112 |
| **Number of rooms in the house when ten years old** | -0.0022 | 0.0011 * | -0.0010 | 0.0008 | -0.0004 | 0.0012 | -0.0007 | 0.0008 | -0.0022 | 0.0015 |
| **Was better than average at math in school when ten years old** | -0.0143 | 0.0047 *** | -0.0082 | 0.0030 *** | -0.0047 | 0.0036 | -0.0031 | 0.0056 | 0.0084 | 0.0111 |
| **Was better than average in language in school when ten years old** | 0.0056 | 0.0044 | -0.0047 | 0.0031 | 0.0003 | 0.0044 | 0.0006 | 0.0044 | -0.0181 | 0.0060 *** |
| **Spent time in the hospital during childhood** | 0.0147 | 0.0062 ** | -0.0058 | 0.0061 | 0.0150 | 0.0095 | 0.0047 | 0.0046 | 0.0041 | 0.0159 |
| **Panel B. Transition from non-ownership to ownership** | | | | | | | | | | |
| **More than ten books in the house when ten years old** | 0.0048 | 0.0029 * | 0.0257 | 0.0075 *** | 0.0193 | 0.0083 ** | 0.0039 | 0.0070 | 0.0136 | 0.0093 |
| **Number of rooms in the house when ten years old** | 0.0014 | 0.0007 * | 0.0018 | 0.0013 | 0.0004 | 0.0013 | 0.0011 | 0.0010 | 0.0021 | 0.0014 |
| **Was better than average at math in school when ten years old** | 0.0087 | 0.0027 *** | 0.0149 | 0.0047 *** | 0.0051 | 0.0037 | 0.0048 | 0.0069 | -0.0077 | 0.0101 |
| **Was better than average in language in school when ten years old** | -0.0037 | 0.0030 | 0.0084 | 0.0050 * | -0.0004 | 0.0046 | -0.0014 | 0.0061 | 0.0167 | 0.0052 *** |
| **Spent time in the hospital during childhood** | -0.0090 | 0.0039 ** | 0.0111 | 0.0114 | -0.0164 | 0.0103 | -0.0078 | 0.0064 | -0.0033 | 0.0145 |

**Notes**: Marginal effects denote the change in the relevant choice probability when our variables of interest change as follows: the binary variables denoting having some books in the house, being above average at math and language at school, and spending time in the hospital during childhood change from zero to one, while the continuous variable denoting the numbers of rooms in the house respondents lived in at age ten changes by one unit.***, **, * denote significance at 1%, 5% and 10%, respectively.

**Table 5. Unconditional (Static) Marginal Effects, Flexible Specification**

| Variable | Stocks | | Mutual Funds | | Individual Retirement Accounts | | Bonds | | Whole Life Insurance | | Willing to take at least some financial risk | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error |
| **More than ten books in the house when ten years old** | 0.0071 | 0.0062 | 0.0273 | 0.0113 ** | 0.0149 | 0.0073 ** | 0.0000 | 0.0051 | 0.0120 | 0.0098 | 0.0459 | 0.0133 *** |
| **Number of rooms in the house when ten years old** | 0.0019 | 0.0015 | 0.0012 | 0.0012 | 0.0001 | 0.0011 | 0.0005 | 0.0009 | 0.0018 | 0.0015 | 0.0054 | 0.0016 *** |
| **Was better than average at math in school when ten years old** | 0.0120 | 0.0044 *** | 0.0088 | 0.0049 * | 0.0039 | 0.0035 | 0.0038 | 0.0038 | -0.0106 | 0.0105 | 0.0086 | 0.0094 |
| **Was better than average in language in school when ten years old** | -0.0087 | 0.0059 | 0.0094 | 0.0046 ** | -0.0013 | 0.0041 | -0.0035 | 0.0044 | 0.0167 | 0.0058 *** | 0.0060 | 0.0140 |
| **Spent time in the hospital during childhood** | -0.0199 | 0.0087 ** | 0.0144 | 0.0082 * | -0.0150 | 0.0093 | -0.0060 | 0.0043 | -0.0019 | 0.0153 | 0.0164 | 0.0201 |

**Notes**: Marginal effects denote the change in the relevant choice probability when our variables of interest change as follows: the binary variables denoting having some books in the house, being above average at math and language at school, and spending time in the hospital during childhood change from zero to one, while the continuous variable denoting the numbers of rooms in the house respondents lived in at age ten changes by one unit.***, **, * denote significance at 1%, 5% and 10%, respectively.

**Table 6. Unconditional (Static) Marginal Effects, Younger Sample**

| Variable | Stocks | | Mutual Funds | | Individual Retirement Accounts | | Bonds | | Whole Life Insurance | | Willing to take at least some financial risk | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error |
| **More than ten books in the house when ten years old** | 0.0005 | 0.0038 | 0.0294 | 0.0109 *** | 0.0241 | 0.0115 ** | 0.0027 | 0.0091 | 0.0048 | 0.0052 | 0.0630 | 0.0127 *** |
| **Number of rooms in the house when ten years old** | 0.0022 | 0.0009 ** | 0.0018 | 0.0015 | 0.0011 | 0.0026 | 0.0011 | 0.0013 | 0.0002 | 0.0009 | 0.0043 | 0.0027 |
| **Was better than average at math in school when ten years old** | 0.0122 | 0.0040 *** | 0.0047 | 0.0101 | 0.0068 | 0.0069 | 0.0032 | 0.0055 | -0.0049 | 0.0040 | 0.0188 | 0.0168 |
| **Was better than average in language in school when ten years old** | -0.0069 | 0.0065 | 0.0109 | 0.0072 | 0.0004 | 0.0079 | -0.0073 | 0.0081 | 0.0090 | 0.0037 ** | 0.0001 | 0.0166 |
| **Spent time in the hospital during childhood** | -0.0112 | 0.0052 ** | 0.0003 | 0.0141 | -0.0212 | 0.0148 | -0.0065 | 0.0082 | 0.0007 | 0.0081 | 0.0137 | 0.0293 |

**Notes**: Marginal effects denote the change in the relevant choice probability when our variables of interest change as follows: the binary variables denoting having some books in the house, being above average at math and language at school, and spending time in the hospital during childhood change from zero to one, while the continuous variable denoting the numbers of rooms in the house respondents lived in at age ten changes by one unit.***, **, * denote significance at 1%, 5% and 10%, respectively.

**Table A1. Marginal Effects on Ownership Transitions, Flexible Specification**

| Variable | Stocks | | Mutual Funds | | Individual Retirement Accounts | | Bonds | | Whole Life Insurance | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error |
| **Panel A. Transition from ownership to non-ownership** | | | | | | | | | | |
| **More than ten books in the house when ten years old** | -0.0073 | 0.0065 | -0.0298 | 0.0120 ** | -0.0125 | 0.0070 * | 0.0002 | 0.0064 | -0.0124 | 0.0105 |
| **Number of rooms in the house when ten years old** | -0.0020 | 0.0016 | -0.0013 | 0.0012 | -0.0001 | 0.0010 | -0.0006 | 0.0012 | -0.0018 | 0.0015 |
| **Was better than average at math in school when ten years old** | -0.0123 | 0.0047 *** | -0.0097 | 0.0055 * | -0.0032 | 0.0030 | -0.0038 | 0.0043 | 0.0107 | 0.0107 |
| **Was better than average in language in school when ten years old** | 0.0089 | 0.0061 | -0.0103 | 0.0050 ** | 0.0009 | 0.0035 | 0.0032 | 0.0048 | -0.0167 | 0.0060 *** |
| **Spent time in the hospital during childhood** | 0.0204 | 0.0090 ** | -0.0158 | 0.0091 * | 0.0122 | 0.0078 | 0.0062 | 0.0049 | 0.0023 | 0.0157 |
| **Panel B. Transition from non-ownership to ownership** | | | | | | | | | | |
| **More than ten books in the house when ten years old** | 0.0079 | 0.0069 | 0.0183 | 0.0102 * | 0.0152 | 0.0072 ** | 0.0001 | 0.0049 | 0.0103 | 0.0084 |
| **Number of rooms in the house when ten years old** | 0.0021 | 0.0016 | 0.0009 | 0.0008 | 0.0001 | 0.0012 | 0.0004 | 0.0008 | 0.0016 | 0.0014 |
| **Was better than average at math in school when ten years old** | 0.0132 | 0.0046 *** | 0.0057 | 0.0035 | 0.0041 | 0.0037 | 0.0040 | 0.0039 | -0.0093 | 0.0093 |
| **Was better than average in language in school when ten years old** | -0.0098 | 0.0067 | 0.0060 | 0.0031 * | -0.0014 | 0.0042 | -0.0038 | 0.0045 | 0.0149 | 0.0052 *** |
| **Spent time in the hospital during childhood** | -0.0223 | 0.0099 ** | 0.0089 | 0.0052 * | -0.0155 | 0.0096 | -0.0062 | 0.0045 | -0.0014 | 0.0137 |

**Notes**: Marginal effects denote the change in the relevant choice probability when our variables of interest change as follows: the binary variables denoting having some books in the house, being above average at math and language at school, and spending time in the hospital during childhood change from zero to one, while the continuous variable denoting the numbers of rooms in the house respondents lived in at age ten changes by one unit.***, **, * denote significance at 1%, 5% and 10%, respectively.

**Table A2. Marginal Effects on Ownership Transitions, Younger Sample**

| Variable | Stocks | | Mutual Funds | | Individual Retirement Accounts | | Bonds | | Whole Life Insurance | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error | Marginal Effect | Std. Error |
| **Panel A. Transition from ownership to non-ownership** | | | | | | | | | | |
| **More than ten books in the house when ten years old** | -0.0005 | 0.0047 | -0.0202 | 0.0086 ** | -0.0267 | 0.0124 ** | -0.0017 | 0.0111 | -0.0052 | 0.0056 |
| **Number of rooms in the house when ten years old** | -0.0027 | 0.0013 ** | -0.0013 | 0.0012 | -0.0012 | 0.0029 | -0.0015 | 0.0018 | -0.0002 | 0.0010 |
| **Was better than average at math in school when ten years old** | -0.0149 | 0.0054 *** | -0.0033 | 0.0076 | -0.0076 | 0.0077 | -0.0025 | 0.0066 | 0.0053 | 0.0043 |
| **Was better than average in language in school when ten years old** | 0.0083 | 0.0079 | -0.0076 | 0.0054 | -0.0003 | 0.0087 | 0.0056 | 0.0089 | -0.0097 | 0.0039 ** |
| **Spent time in the hospital during childhood** | 0.0135 | 0.0066 ** | -0.0001 | 0.0107 | 0.0239 | 0.0164 | 0.0052 | 0.0099 | -0.0006 | 0.0089 |
| **Panel B. Transition from non-ownership to ownership** | | | | | | | | | | |
| **More than ten books in the house when ten years old** | 0.0006 | 0.0034 | 0.0315 | 0.0112 *** | 0.0193 | 0.0135 | 0.0030 | 0.0081 | 0.0053 | 0.0058 |
| **Number of rooms in the house when ten years old** | 0.0019 | 0.0008 ** | 0.0019 | 0.0016 | 0.0010 | 0.0022 | 0.0009 | 0.0009 | 0.0002 | 0.0010 |
| **Was better than average at math in school when ten years old** | 0.0109 | 0.0037 *** | 0.0052 | 0.0108 | 0.0053 | 0.0061 | 0.0033 | 0.0051 | -0.0054 | 0.0044 |
| **Was better than average in language in school when ten years old** | -0.0063 | 0.0059 | 0.0117 | 0.0076 | 0.0005 | 0.0063 | -0.0076 | 0.0079 | 0.0100 | 0.0039 ** |
| **Spent time in the hospital during childhood** | -0.0100 | 0.0047 ** | 0.0007 | 0.0150 | -0.0165 | 0.0141 | -0.0064 | 0.0074 | 0.0005 | 0.0091 |

**Notes**: Marginal effects denote the change in the relevant choice probability when our variables of interest change as follows: the binary variables denoting having some books in the house, being above average at math and language at school, and spending time in the hospital during childhood change from zero to one, while the continuous variable denoting the numbers of rooms in the house respondents lived in at age ten changes by one unit.***, **, * denote significance at 1%, 5% and 10%, respectively.

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