Childhood Determinants of Risk Aversion: The Long Shadow of Compulsory Education*

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Abstract

In the Panel Study of Income Dynamics individuals' risk aversion is strongly influenced by the educational accomplishments of their parents. This observation motivates an important policy question; namely, whether attitudes such as risk aversion are partly formed by educational policy. We ask if state-level compulsory schooling laws that boosted parents' education made children less risk averse through adulthood. The answer is yes. Other significant determinants of risk aversion are age, gender, religion, and risk aversion of parents. We verify that risk aversion matters for economic behavior: it predicts individuals' volatility of income, the share of stocks in household portfolios, and how likely households are to own businesses.

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1 Introduction

In the Panel Study of Income Dynamics (PSID) risk aversion is measured by asking participants about their willingness to participate in a hypothetical lottery as suggested by Barsky, Juster, Kimball, and Shapiro (1997). In this paper, we examine the determinants of risk aversion and our main finding is that parental education, especially that of mothers, determines children's risk aversion.

Parents choose their own education and this choice is a function of unmeasured attitudes and abilities that may directly affect children's risk aversion. Therefore, a relation between parental education and children's risk aversion does not necessarily imply a causal effect of policies that increase parental education. However, in the past there have been significant changes in educational policy that may help us identify such an effect: U.S. states implemented child labor laws and school attendance laws—which we collectively refer to as "compulsory schooling laws"—as part of the "high school movement" in the early 20th century. These changes can be considered a "natural experiment" providing exogenous, policy driven variation in parental education. The potential effects of compulsory schooling on economic outcomes are first studied by Acemoglu and Angrist (2001), who estimate the monetary return to schooling in the United States. Other researchers study the econometric validity and the economic implications of these laws: Lleras-Muney (2002) and Goldin and Katz (2003) find that these laws indeed raised educational levels. Oreopoulos (2006) finds similar effects from changes in compulsory schooling in the United Kingdom, while Lleras-Muney (2002) concludes that the U.S. law changes were implemented as responses to exogenous political pressures. Oreopoulos, Page, and Stevens (2004) seem to be the first to examine intergenerational effects of the changes in compulsory schooling, finding an effect of parental education on children's grade retention and dropping-out rates.[1]

Our focus is on the intergenerational effects of the compulsory schooling changes on risk aversion. Individuals' willingness to bear risk is important for economic outcomes. Starting a business is a risky venture, investing for retirement involves the balancing of risk with expected returns, and high paying occupations may have less predictable income streams. The upshot is that individual or even aggregate economic outcomes are dependent on attitudes towards

[1] Black, Devereux, and Salvanes (2005) find no intergenerational effect of compulsory schooling laws on children's education in Norway.

risk taking. It is, therefore, important to study how preferences for risk taking or aversion are formed. Using instrumental variables (IV) estimation techniques, we examine if longer parental education, following tighter compulsory schooling laws, resulted in less risk aversion of children. We find that this is so. Many participants in the PSID are middle-aged (or older) in 1996, when risk aversion is measured, and their parents' schooling, therefore, is many years in the past—compulsory schooling laws "cast a long shadow."

Why does parental schooling have an impact on children's risk attitudes? We can provide a partial answer to this question using matched children-parents pairs from the PSID. Children of parents with high education tend to also have high education but our evidence suggests that the effect of parental education on children's risk aversion is not mainly caused by more educated children having lower risk aversion. Parents with low risk aversion tend to have children with low risk aversion—possibly due to children directly learning about financial risk taking from their parents ("mimicking") or possibly due to a genetic component but parental education influences children's risk aversion beyond what is explained by parental risk aversion. We also find that parents with a high level of "trust" and those who "want their children to be leaders" have less risk averse children. Overall, it appears that parental attitudes, some of which are impacted by compulsory schooling laws, determine the risk aversion of offspring while it is less clear if there is a transmission channel working through children's own schooling.

Psychologists have also studied risk attitudes. In the early literature, risk-taking is seen as a personality trait.[2] Personality theorists focus on "sensation seeking" and develop scales (e.g., Zuckerman 1979). Recent papers suggest that risk should be regarded as a "multi-dimensional construct." For example, Trimpop, Kerr, and Kirkcaldy (1999) differentiate between planned, reckless, or assertive forms of risky behavior. Zaleskiewicz (2001) distinguishes between risk-taking behavior related to achievement motivation (instrumental risk) and risk-taking behavior caused by the need of stimulation (stimulating risk). In the first case—which is more related to risk aversion as economists measure it—risk is taken to achieve an economic goal in the future, while the second case relates to whether an individual is looking for immediate excitement. Zaleskiewicz (2001) finds that the two measures are only moderately correlated: some people are risk takers, some people avoid all risks but many individuals clearly distinguish both types of risks.[3] He also finds a correlation between instrumental risk-taking and rational thinking

[2]Bromiley and Curley (1992) provide an extensive summary of this literature.

[3]Interestingly, the correlation seems to be stronger for women. Byrnes, Miller, and Schafer (1999) suggest that

and future orientation. Thus, more analytical individuals would behave more risk tolerantly when facing instrumental risk. This finding relates to Benjamin, Brown, and Shapiro (2005) who find that more cognitively able individuals (particularly in the math sphere) tend to show less risk aversion.[4] Loewenstein, Weber, Hsee, and Welch (2001) suggest that people evaluate risks cognitively but also react to risks emotionally. They show that emotional reactions to risky situations in many cases differ from cognitive assessments and often drive behavior. Shiv, Loewenstein, Bechara, Damasio, and Damasio (2005), in a fascinating paper using subjects with brain damage in areas that affect emotions, show that individuals who are less emotional tend to be less risk averse.

Our reading of the literature, combined with our findings, is that risk attitudes are determined by many channels, likely involving cognitive abilities, emotions, and mimicking of parental behavior. Our results provide support for some of these channels but stop short of providing a complete map of the determinants of risk aversion. Likely, such a complete map will need to be pieced together from future studies involving natural as well as planned experiments.

Our secondary results are as follows. We find, in OLS-regressions, that blacks are more risk averse than whites when we do not include measures of average income and educational level in the county where (and when) the PSID participant grew up. However, including county-level variables makes race insignificant indicating that race is correlated with the quality of the environment. In the IV-regressions, county effects are not significant and again we do not find racial differences in risk aversion. Other significant childhood determinants of risk aversion are whether both parents were present during the respondent's childhood, religion, age, and sex, with head-of-household females being more risk averse. Similar results were found by Dohmen, Falk, Huffman, Schupp, Sunde, and Wagner (2006)—using German data—although these authors do not explore neighborhood effects, nor the effects of changes on compulsory schooling laws.

Finally, we ask if risk aversion predicts economic behavior. Using parental variables as instruments, we verify that risk aversion predicts the volatility of income, the composition of portfolios, and the propensity to own a business or become self employed. All in the direction expected from a priori reasoning.[5]

women may not be able to distinguish types of risks as well as men. Zuckerman (1994) proposes an evolutionary explanation. Men were required to make risk choices more often than women.

[4]The PSID is not well suited to address this question. A measure of IQ is available, and we find that it does not predict risk aversion, but the PSID's IQ-measure is not intended to measure "mathematical intelligence."

[5]Guiso and Paiella (2004) examine a related measure for Italy and find that it predicts choices such as portfolio selection and occupation of Italian consumers.

In Section 2, we describe our data and discuss the measure of risk aversion. In Section 3, we explain our econometric methods and analyze the determinants of risk aversion and, in Section 4, we examine the role of risk aversion in explaining the volatility of income, the composition of household portfolios, as well as the decision to become a business owner or self-employed.

2 Data

We use data from the PSID which is a large panel of individuals and their offspring. This survey started in 1968, interviewing about $4,800$ households. 60 percent of the initial households belong to a cross-national sample from the 48 contiguous states, while the other portion is a national sample of low-income families from the Survey of Economic Opportunity. The PSID follows these original households and households initiated by their offspring over time, conducting annual interviews (biennial since 1997), thereby creating a panel dataset on income, demographic information, food consumption, etc. At irregular intervals the panel participants are interviewed about wealth and savings and the panel members are at times asked supplementary questions of interest. A series of questions asked to elicit attitudes towards economic risk in 1996 are of central relevance for this study. We describe the questions and how we construct a measure of risk aversion next.

2.1 Measuring risk aversion

In 1996 employed heads of household were asked about their willingness to take jobs with different income prospects. The questions are very similar to those introduced and analyzed by Barsky, Juster, Kimball, and Shapiro (1997).[6] The first question reads as follows:

> "Now I have another kind of question. Suppose you had a job that guaranteed you income for life equal to your current, total income. And that job was [your/your family's] only source of income. Then you are given the opportunity to take a new, and equally good job, with a 50-50 chance that it will double your income and spending power. But there is a 50-50 chance that it will cut your income and spending power by a third. Would you take the new job?"

[6] With the exception that in the PSID, the question indicates that the new job will be equally good—having the same non-monetary attributes—as their current job.

Depending on the answer, the respondent is asked similar questions with job prospects that always double income with a 50 percent probability and cut income by a changing fraction $1-\lambda$ (with $1-\lambda$ equal to 10, 20, 50 or 75 percent, respectively). For example, if a participant answers "yes" to the first question (with an income loss of one third), the next question presents a scenario with a possible 50 percent cut in income. However, if the participant answers "no" to the first question, the income loss is reduced to just 20 percent in the next lottery question. Figure 1 summarizes the sequencing of all questions.[7]

According to expected utility theory, if a respondent answers "yes" to a particular lottery question, then:

$$\frac{1}{2}U(2c) + \frac{1}{2}U(\lambda c) \geq U(c).$$

Assuming agents rank outcomes according to a Constant Relative Risk Aversion (CRRA) utility function, $U(C) = \frac{c^{1-\rho}}{1-\rho}$, there is a relationship between the Arrow-Pratt coefficient of relative risk aversion ρ and λ; for the indifferent individual $\lambda = (2 - 2^{1-\rho})^{\frac{1}{1-\rho}}$. By changing the cut-off point $(1-\lambda)$, one can bracket the respondent's willingness to take risk measured by the coefficient of relative risk aversion. We calculate the conditional mean of ρ in each group following the methodology described in Barsky, Juster, Kimball, and Shapiro (1997) and in the PSID documentation.

The five questions allow us to classify respondents into six distinct risk aversion groups. Table 1 presents a mapping of the respondents' answers to the implied lower and upper bounds for relative risk aversion in each group, as well as the conditional mean that we compute. Respondents in the same group are assigned the (corresponding) conditional mean as their relative coefficient of risk aversion. Thus, our measure of risk aversion will only take 6 different values. Table 1 shows that the coefficient varies from 0.18 to 33.9, with 50 percent of respondents having a coefficient of relative risk aversion above 5.

These questions have only been asked once in the PSID. This limits our sample size to approximately 5,000 individuals to begin with. Moreover, unlike Barsky, Juster, Kimball, and Shapiro (1997), we cannot correct for possible measurement error by studying answers by the same individual at different points in time.

[7] In our analysis, we only keep respondents with a complete answer record to the series of questions.

2.2 Environmental variables

We use a series of retrospective questions about the respondent's background to construct variables that capture the environment where the respondent grew up. Particularly relevant for our analysis are variables relating to parents' education and the county where the individual grew up, which we describe next. Appendix A provides a brief description of all regressors.

Respondents are asked how much education their parents (or "substitute parents") had. The responses are classified into 8 different categories ranging from "0-5 grades" of schooling to "graduate work/Ph.D./professional degree." We create college and high school dummies for each parent. The father high school dummy takes the value 1 if the respondent reports a father with a high school degree or more education. The father college dummy is 1 if the respondent reports a father with some college education or more. The dummies for the mother are constructed analogously. In our analysis, we also construct a combined variable for parents' education which is simply the sum of these four dummies.

Up to 1993, respondents were asked to provide information about the county where they grew up. We also know the age of the individual at the time of the 1996 interview. This information, combined with county-level data, allows us to construct a series of variables to measure the "quality" of the county where the respondent grew up when the respondent was a child. We obtain county-level information from Haines (2004) who compiled county-level data for 1790-2000 from historical decennial census and county data books (for the more recent years). The county-level data is not annual but decennial. In the construction of our individual-specific county variables, we find the closest county-level data point to the year when the respondent was 10 years of age. For example, if the respondent was 40 years at the time of the 1996 interview, he/she was 10 in 1966 so we use county-level information for 1970. For each county, we collect median income, the percentage of urban population, the median house value, and the percentage of population 25 and older with college degrees.

We further construct variables that summarize state-level compulsory schooling laws that may have affected the education level of the respondent's parents. Acemoglu and Angrist (2001) compile information on compulsory schooling laws.[8] In particular, they produce a variable summarizing compulsory attendance laws, "CA" (the minimum years in school required before leaving school, taking into account certain age requirements), and a variable summarizing child

[8] We thank Acemoglu and Angrist for sharing their data with us.

labor laws "CL" (the minimum years in school required before work is permitted). The CA variable is concentrated in the 8-12 range, and the CL variable in the 6-9 range. Acemoglu and Angrist use 4 dummies for each variable to capture their respective distributions.[9] These authors document that the compulsory schooling and child labor variables vary greatly by state and over time, and correlate with individual educational attainment. We match their variables to our PSID respondents, which is possible because the PSID contains information on the state where the respondent's parents grew up. Moreover, for roughly 30 percent of our individuals (whose parents have also been interviewed by the PSID at one point) we know the exact year when their parents were born. For the rest, we assume the parents' age equals the respondent's age plus 25. The compulsory schooling/child labor variables refer to the state where the respondent's father (or mother) grew up and we use the status of the laws at the time the respondent's parent was 15 years of age.

Other variables used are race, age, sex, whether the respondent grew up in a city, if he/she lived with both parents, if the respondent recalls his/her parents being rich while growing up, religious preference, and dummies for region or state of residence while growing up.

The sample size of our cross-section is bounded by the number of people who gave complete answers to the risk aversion questions in 1996. Moreover, since some individuals choose not to answer other questions required for the construction of regressors (e.g., the parental education questions), the sample size is further reduced. A large number of observations is lost because in 1993 the PSID stopped reporting the county where the individual grew up.

3 Estimation: Determinants of Risk Aversion

3.1 Econometric issues

Our first set of estimations apply simple OLS allowing for heteroskedasticity of unknown form when calculating standard errors. Our preferred specification involves variables that are exogenous to risk aversion, namely, age, sex, race, and parental variables including compulsory schooling and labor laws in the state where and when the parents grew up. We will verify that our results are robust to the inclusion of potentially endogenous variables. For example, an individual may have high education due to, say, parents' high education. If individuals with high

[9]For the compulsory attendance laws: CA8=1 if CA $\leq$ 8, CA9=1 if CA = 9, CA10=1 if CA=10, CA11=1 if CA$\geq$ 11. For the child labor laws: CL6=1 if CL$\leq$ 6, CL7=1 if CL=7, CL8=1 if CL=8, CL9 if CL$\geq$9.

education have low risk aversion, we would find that parents' education appeared to directly explain offspring's risk aversion while the true effect is indirect—through children's education. Results that are robust to inclusion of such variables are likely to capture direct effects. The reason we do not include such variables in our main regression is that we do not know the direction of causality if own education is correlated with risk aversion. Other potentially endogenous variables are the individual's income and wealth.

The risk aversion measure is constructed under the assumption that the utility function is of the CRRA variety. This maintained assumption may be questionable—however, the risk aversion measure takes six values that are ordered in terms of risk aversion, independent of functional form. To examine if our results are robust to the CRRA assumption we alternatively study the determinants of risk aversion using both a probit and an ordered logit estimator. While these estimators also depend on (statistical) assumptions, they are robust to deviations from the CRRA assumption. We consider our findings robust if these quite different strategies result in similar conclusions to those of our initial OLS and IV regressions.

3.2 Descriptive statistics

Table 2 displays descriptive statistics for our main variables. In order to simplify the presentation, we have combined some less essential regressors based on pre-tests. In particular, we have combined the midwestern and southern regional dummies, and the indicators for Baptist and Lutheran religion. We do not display results for dummies for regions and religions that were consistently found to be insignificant predictors of risk aversion. The risk aversion measure has a mean of 12.4 with a large standard deviation of 14.7. The average age of the PSID participants in our sample is about 41 years in 1996 with the oldest being 87 and the youngest 19 years old. In general, the table speaks for itself but one may notice that blacks are over-sampled at 30 percent and females make up only 24 percent. This is due to the structure of the PSID where the male typically is the head of household. An implication is that females interviewed by the PSID are not typical for females in the U.S. population.

To measure the "quality" of the county where respondents grew up, we compute the county principal component, a linear combination of the four county-level variables considered—median income, education, percent of urban population, and median house value. These "components" all contribute positively to the principal component. The variable denoted "parents' education"

is the sum of the 4 dummy variables for father's and mother's high school and college education. An individual will be assigned a value of 1 if either his/her father or mother finished high school, a value of 2 if both parents finished high school or one finished college while the other did not finish high school. The purpose of this variable is to simplify the analysis of the impact of parental education. We verified that the results using this variable are very similar to results obtained using the largest principal component for the 4 parental dummy variables—the interpretation of the regression results are less transparent when an education principal component is used.

Table 3 shows the correlation matrix for risk aversion, the variables included in our regressions, and the state-level instrumental variables. We see that risk aversion is positively correlated with age, dummies for being a female, black, Lutheran-Baptist, and growing in the Midwest/South while it is negatively correlated with parents' education, the county principal component, dummies for whether the head lived with both parents, had rich parents, grew up in city, grew up in the West, compulsory schooling laws in states where parents grew up, and labor laws. Roughly, it seems that risk aversion declines with indicators of wealth and education. Importantly, the schooling laws and labor laws are positively correlated with parental education which is a necessary condition for these variables to be useful instruments. Many regressors display non-negligible correlations implying a role for multiple regression in sorting out the relative effects.

3.3 Results from OLS regressions

In Table 4, we show our results for the determinants of risk aversion. Column (1) shows that risk aversion initially declines with age and then increases. Blacks are more risk averse as are female heads. Barsky, Juster, Kimball, and Shapiro (1997) and Dohmen, Falk, Huffman, Schupp, Sunde, and Wagner (2006) also find that women are more risk averse. Parental, in particular mothers', education has a very strong impact on offspring's risk aversion—the higher parental education the lower risk aversion—a result also found by Dohmen, Falk, Huffman, Schupp, Sunde, and Wagner (2006). The estimated coefficients to mother high school and mother college are uniformly significant at the 5 percent level and in the order of –1 with the coefficient for college being a little larger. The coefficient for father's college is also around –1 and nearly or marginally significant. Overall, the results for parents' educations reveal not only large effects but effects that are not exhausted by just one parent being highly educated even if the mother's

education is the more important determinant. Individuals who grew up with two parents are less risk averse, while growing up with wealthy parents (as recalled by the subject) seems to not matter much. Individuals who profess to be Lutheran or Baptist are significantly more risk averse.

In columns (2)-(5), we explore the role of county-level variables. We were not able to separate out the effects of the different county-level variables due to collinearity but it is clear that individuals that grew up in "good" counties are significantly less risk averse, whether good is measured by median county income (column 2), the fraction of urban population (column 3), the fraction of population with a college degree (column 4), or the median house value (column 5). In column (6), we include a principal component of these variables (which all have positive loadings) and we see that the principal component, with high statistical significance, predicts risk aversion. One interesting result from including the county variables is that race turns insignificant. The implication is that blacks are not inherently more risk averse than whites; rather, blacks tend to live in predominantly poorer counties and growing up in such counties results in a higher level of risk aversion. In column (6), we further simplify the model by using the parental education variable which summarizes the education of both parents. We find a coefficient of –0.87 with a very high t-statistic of 4.6. In column (7), we add regional dummies and find that people who grew up in the Midwest/South and the West are less risk averse. In Table 3, we showed that the simple correlation with risk aversion is negative for West and positive for Midwest/South so it appears that the higher risk aversion in the Midwest/South is a reflection of other regressors such as religious attitudes and education and not an underlying tendency in this region. Finally, in column (8), we include dummies referring to the state where the respondent grew up. While the coefficient for the parental education variable does not change significantly, the coefficient for the county level variable increases (in absolute value) slightly from –0.59 to –0.69.

Table 5 examines if the OLS results are sensitive to the inclusion of potentially endogenous regressors that are likely to affect risk aversion. The exclusion of such variables could result in left-out variable bias in Table 4. We find that individuals with high education are significantly less risk averse even though we do not rule out that this may be due to reverse causality; for example, if people consider investing in education to be risky. Including this variable lowers the significance of many regressors a bit but not by much. A priori, one might worry that the estimated effect on parental education would be sensitive to the inclusion of own education

but this variable retains its very strong significance. Own income does not predict the level of risk aversion, which lends some support to the CRRA assumption, while high own wealth significantly predicts high risk aversion (perhaps because of reverse causation). The inclusion of this variable, however, does not change the estimated impact of the exogenous variables noticeably. Similar conclusions obtain when we include all three variables, and if we also include dummies for the current state of residence. We also attempt to see if individuals with higher ability, as measured by the IQ measure included in the PSID, have lower risk aversion but this variable is clearly insignificant—maybe because it does not capture mathematical IQ well. We conclude that the OLS regressions are robust to the most likely forms of left-out variable bias.

The overall impression is that age and sex affect risk aversion. Parental education is a very strong predictor for risk aversion as are broader environmental factors such as the "quality" of the county of childhood and the region where the person grew up. The OLS regressions show the effects of exogenous variables on risk aversion. However, one has to be very careful in interpreting the results as predicting the impact of a policy induced change in parents' education or quality of the county. Parents' education is a choice variable for the parents and whether, say, parents have a high school degree will be a function of the general attitude towards education in the family (maybe reflecting the value of investing in education), and things such as parents' abilities or attitudes. Growing up in a wealthy county may also be a choice of the parents—a very large literature on the impact of schooling on economic outcomes grabbles with this and other problems arising from education not being randomly assigned to individuals (see, e.g., Card 2001).

3.4 Results from IV regressions

In order to examine if educational policy affects offspring's risk aversion, we apply instrumental variables estimation using instruments that changed parental education without affecting parental abilities or endowments, namely the changes in compulsory schooling and child labor laws used by Acemoglu and Angrist (2001). We start from the specification of column (7) in Table 4 which compresses the parental education dummies into one variable (the sum of the dummies).

First, we need to establish that the instruments are able to predict the level of parental education with reasonable significance. Table 6 shows the results of first stage regressions of

parents' education on the compulsory schooling law variables together with the exogenous variables. The columns reflect the different specifications and samples to be explained in connection with the second stage regression but in all columns it is clear that the instrumental variables, in particular CA9 (a dummy equal to 1 if the state where the respondent's father grew up required 9 years of schooling attendance when the father was 15 years old), are highly significant.[10]

In Table 7, we turn to the second stage IV estimation results. OLS results are presented in the first column for easy reference. In column IV-1, we instrument the parental education variable with the compulsory schooling/child labor laws in the state where the parents grew up. The point estimate for the impact of education is now more than twice as large as the OLS-estimate. It is, however, not statistically significant with a t-statistic of 1.19. The county principal component is now estimated to have a much lower impact and is far from significant.

In the remaining columns, we show that the instrumented parental education variable is significant if clearly insignificant variables are dropped or a larger sample is utilized. In column IV-2, we display the estimates when the county variable is left out. The estimated effect of education is now more precisely estimated with a t-statistic which is significant at about the 10 percent level. It is striking that state schooling laws that occurred on average 50 years before the measuring of risk aversion in 1996 still have significant explanatory power. Further, leaving out the racial dummy increases the precision of the estimate and the estimated coefficient becomes significant at the 5 percent level. A fairly large number of households do not have parental education *or* county information available but when the county variable is dropped the sample can be expanded by about 750 observations leading to more precise estimates—presented in column IV-4. For the larger sample, the point estimates indicate that parental schooling has a very strong and significant (at the 1 percent level) impact on children's risk aversion. We can also note that the dummy for West is now insignificant which indicates that the OLS significance of "West" may not be due to a different culture in Western states other than what leads to more stringent compulsory schooling laws. The results are robust to the inclusion of state dummies for either the state where the respondent grew up or the state where respondents' fathers grew up (columns IV-5 and IV-6).

The impact of race is consistently insignificant in this table. Living with both parents is also

[10]The CA and CL dummies for mothers are absent because they are not significant once the dummies for fathers are included. The correlation for fathers and mothers CA is 0.7, while the correlation for mothers and fathers CL is 0.75.

insignificant when parental education is instrumented and the implication is that this variable may pick up effects of schooling as well. Less clearly, there is evidence of similar effects for the Midwest/South dummy and the Lutheran-Baptist religion dummy.

Our interpretation of the difference between the OLS results and the IV results in Table 7 is that the coefficient to "parents' education" in the OLS estimates is smaller because parental education is a function of many factors beyond required schooling and the estimated IV-coefficient is larger because it isolates the effect of compulsory schooling.[11] The county variables are positively correlated with schooling and since the OLS estimate of parents' schooling is numerically "too low" the county principal component will, in the OLS setting, be significant as it captures some of the correlation between risk aversion and schooling. If this interpretation is correct, growing up in a "good" county does not have an independent effect on risk aversion.

An alternative explanation of why estimated returns to schooling using IV exceed estimated returns with OLS is that the IV coefficient is capturing higher gains from schooling for a peculiar group amongst the more general population, the group affected by the compulsory schooling laws. Although we cannot rule out this explanation, Oreopoulos (2006), using data for the U.K. and a change in schooling laws that affected the majority of the population, finds a similar result concluding that the average treatment effect in the U.K. is, in fact, of similar magnitude to the marginal treatment effect found in the U.S. In any event, the main goal of the present paper is to demonstrate that changes in compulsory schooling laws can affect children's risk aversion many years later and this result is important even if the main impact were disproportionately on certain, maybe disadvantaged, segments of the population.

3.5 Results from probit and ordered logit regressions

A large fraction of the variation in risk aversion comes from the difference between highly risk averse individuals and other individuals. In the left-most four columns of Table 8 we demonstrate that the difference between the highly risk averse individuals and others is highly significant. We compress the information in the six risk aversion categories into two, which we refer to as "very risk averse individuals" versus "less risk averse individuals." The sample in the first category consists of heads with the highest value for risk aversion (33.9), while the remaining respondents comprise the sample in the second category. We then use a probit model to examine

[11] Technically, this is equivalent to measurement error and it is well-known that measurement error biases coefficients towards zero.

the probability that individuals are very risk averse. The results are similar to those obtained with the linear model. Parents' education is a strong predictor of risk aversion. If instrumental variable techniques are used, the point estimate is larger and significant at the 1 percent level (5 percent in column 2). It appears that high parental education chiefly affects risk aversion by lowering the probability that children will become *very* risk averse.

The results of the probit estimations do not rely on the functional form of agents utility functions. To further examine if our results are robust to the CRRA assumption, we analyze the determinants of risk aversion using an ordered logit estimator—see the last four columns in Table 8. The overall pattern in the estimated coefficients is similar to that of the previous models with significant estimates for parents' education (in all specifications) which are larger when instrumented. Race is not significant in this table—only age, sex, and parental education seem to be robustly significant.

3.6 Results from matched samples

The particular structure of the PSID, that follows households and their offspring, allows us to create a small matched sample with observations on risk aversion for an individual and that individual's father or mother (about 675 respondent/father pairs and 330 respondent/mother pairs). This matched sample can be used to examine which parental attitudes determine the risk aversion of children in more detail. For example, well-educated parents may try to deliberately influence their offspring's risk tolerance, but children may also become more risk tolerant by interacting with risk tolerant parents. Of course, more risk tolerant parents may be more educated making it hard to disentangle the two effects.[12]

Our matched sample is comparatively small. In fact, for this particular sample, only the mother's college dummy is significant at the 5 percent level. Thus, our specification here deviates slightly from the previous ones and uses the mother's college dummy as the main measure of parental education. Also, the sample happens to include mainly the youngest respondents to the risk aversion question (the average age is 30 with a standard deviation of 6.8) and age is not significant. The parental education variable has the right sign in IV regressions but it is far from significant (results not tabulated here for brevity), indicating that compulsory schooling laws have less of an effect on these individuals who are significantly younger on average. Therefore,

[12]The simple correlation for risk aversion and the college dummies is –0.11 for fathers and –0.08 for mothers.

Table 9 only presents (non-instrumented) linear and probit regressions. Given that the sample is small, we do not attempt to separate the effect of fathers' and mothers' risk aversion and we construct a single dummy variable "parents' risk tolerance" equal to 1 if either the respondent's father or mother have risk aversion below 1.5, comprising the three lowest values of risk aversion. According to this measure, about 23 percent of the respondents have risk tolerant parents.

Column (2) in Table 9 shows that mothers' education and parents' risk tolerance both have a negative significant effect on risk aversion—a result also found by Charles and Hurst (2003). However, the result is not quite robust to the inclusion of the county principal component which limits the sample size even more; see column (4). Columns (6)-(10) present probit regressions, perhaps more appropriate given the sample size. In these regressions the probability of being very risk averse decreases significantly with both parental education and risk tolerance.[13]

We also analyze the effect on risk aversion of family business ownership (a potentially risky venture) when the respondent was a child. Some of the youngest respondents to the risk aversion question grew up "within" the PSID panel and we can directly observe family characteristics when the individual was a child. We construct a variable that counts the number of years the respondent's parents report owning a business when the respondent was 7 to 13 years of age (i.e., the variable takes values from 0 to 7). Results are reported in Table 10. Business ownership has a clear effect on risk aversion, even after controlling for parental education. This finding confirms our previous result that children may become more risk tolerant from interacting with risk taking parents. Table 10, columns (4) and (7), show that parental income when the respondent was a child does not predict risk aversion once we control for parental education.

Lastly, we explore a series of questions in the 1972 wave of the PSID regarding parental attitudes—we match parents with valid answers to these questions to children with responses to the risk aversion supplement. Some parental attitudes may have an affect on risk aversion beyond the effect of parental schooling. On the other hand, parental schooling may affect children's risk aversion by changing parental attitudes. The variables we consider are: (1) A parental planning score, which measures parents' future orientation. (2) A trust/hostility score, to some extent a measure of positiveness. (3) A dummy variable equal to 1 if parents report that they would prefer their children to be leaders as opposed to being popular with their classmates. (4) A measure of parental educational aspirations for their children (a dummy variable equal to one

[13]We here define "more risk averse" to include agents with a risk aversion coefficient of 5.44 or 33.9 (the two highest categories). We chose this split to obtain groups of about equal size.

if parents hope all their children to finish college). Exact variable definitions are provided in Appendix A.[14]

Table 11 presents the results. The leader dummy clearly has significant effects on children's risk aversion. Also, parents who are more trusting have less risk averse children (significant at the 10 percent level). While the educational aspirations variable is significant at the 10 percent level when parental education dummies are left out, it becomes insignificant when the parental education measures are included while the parental education variable itself retains its significance.[15]

Overall, the results of the matched regressions indicate that parental attitudes—in particular parents' own risk attitude—matter for children's risk aversion. Nonetheless, the attitudes measured by the PSID do not appear to be the main channel of transmission from parental schooling to offspring's risk attitudes. Likely, parental education affects children's behavior in a multitude of different ways and we leave it to future research to explore this issue further.

4 Risk Aversion Matters

In this section, we relate risk aversion to household choices that, in theory, should be affected by risk attitudes. First, we examine the effect of risk aversion on household income volatility; second, we examine the effect of risk aversion on the composition of household portfolios; third, we analyze the relation between risk aversion and business ownership.[16]

4.1 Risk aversion and income volatility

The economic literature emphasizes the importance of income volatility for household choices regarding consumption, savings and wealth (e.g., Caballero 1990, Hubbard, Skinner, and Zeldes

[14]The PSID also reports a "risk avoidance" score, which is based on a variety of answers such as whether the parent has medical and auto insurance, wears seat belts and is a smoker. This measure, which is quite different from our measure of risk aversion, does not explain the risk aversion of children.

[15]We also directly verified through regressions that parental attitudes to some extent are determined by parental schooling, as captured by the exogenous changes in schooling laws. In particular this is true for the planning score. The R-squares in these regressions were very low at less than 0.01 making it unlikely that these variables correspond to major channels of transmission from parental education to children's risk aversion.

[16]Benjamin, Brown, and Shapiro (2005) find a relation between cognitive ability and risk aversion. Individuals with high cognitive ability may be less risk averse because they are able to plan better in the face of uncertainty. We, therefore, examine if the results in this part of the paper are robust to the inclusion of (children's) planning score. However, the outcomes we consider are not impacted significantly by the planning score and the significance of the risk aversion is not sensitive to whether this measure is included. We, therefore, do not tabulate these results.

1994). Households, when facing relatively high future income risk, reduce their current consumption and save more to prepare for possible bad income realizations. This type of savings is known as "precautionary savings." Carroll and Samwick (1997) and Skinner (1988) find that precautionary savings are substantial. Other researchers find a small precautionary motive (e.g., Guiso, Jappelli, and Terlizzese 1992, Dynan 1993). The latter finding is often attributed to the fact that one cannot control for risk aversion (e.g., Fuchs-Schündeln and Schündeln 2005).

Risk aversion, being usually unobserved, can be negatively correlated with household income volatility due to self-selection of risk tolerant households into occupations with more volatile incomes. For example, Skinner (1988) finds, in a regression framework, that savings of salesmen and self-employed are lower than savings of craftsmen. The former professions are typically thought to have more volatile income paths and, therefore, in accordance with the precautionary savings paradigm, should save more. Skinner accepts the possibility that self-employed and salesmen, having more volatile incomes, are at the same time more tolerant towards risks and that self-selection bias might lead to the finding of lower average savings for professions with larger income volatility.[17] IV regressions will only correct for such bias if the instruments are not subject to self-selection, but Carroll, Dynan, and Krane (2003), in the context of precautionary wealth regressions, argue that (usually unobserved) risk aversion can be correlated both with conventional instruments for income volatility—educational attainment, industrial affiliation, or occupation—and with household wealth accumulation. This implies that instrumental variables regressions of household wealth holdings on income volatility may not be robust to self-selection.

We analyze the effect of risk aversion on the volatility of household and head-of-household labor income. Specifically, we relate the variation in risk aversion due to exogenous factors to the volatility of idiosyncratic household and head-of-household labor income. We define idiosyncratic household income, as is typical in the literature, as the residual from a cross sectional regression of log household labor income (defined as the sum of head's and spousal real labor income and their combined transfer income) on the education of the head, dummies for the household state of residence, marital status, race, sex of the head, and a second degree polynomial in head's age. For these regressions, we use data from the 1969–1997 annual family files of the PSID. Idiosyncratic head-of-household labor income is constructed analogously.

Since only household heads have records on risk aversion, we first relate the volatility of

[17] Fuchs-Schündeln and Schündeln (2005) find important self-selection of more risk averse households into less risky occupations.

idiosyncratic head-of-household income to the head's risk aversion. Arguably, the welfare of a household is affected by the volatility and the level of total household income, of which the head's labor income is only a portion. Therefore, we show that results are robust whether we consider the volatility of head or household income.

Table 12 presents the results of instrumental variables estimation of the volatility of the idiosyncratic head-of-household labor income on risk aversion and demographic controls. As can be seen in column (1), risk aversion is significantly negatively related to volatility of the head's labor income. Blacks have more volatile income as do male heads, while married and more educated heads have less volatile income streams. In the PSID, heads are females predominantly when they are unmarried; thus, the result of less volatile income for female heads may reflect the fact that they choose careers taking into account that they are largely devoid of the type of insurance married couples have—the income of the spouse. The negative relation between education and the volatility of the idiosyncratic head-of-household labor income is well-known in the literature (e.g., Meghir and Pistaferri 2004).

The negative effect of (instrumented) risk aversion on income volatility may be sensitive to the exclusion of other relevant but potentially endogenous controls. In column (2) of Table 12, we present results adding average household net worth and average household income to the regression. The significant negative effect of risk aversion on income volatility is robust to the inclusion of these controls.

Household income and individual income are typically modeled as the sum of a persistent or permanent component and a transitory component. It has been argued that the volatility of transitory shocks to household income is not as important for wealth accumulation as the volatility of permanent shocks, presumably because transitory shocks can be better insured through credit markets (e.g., Carroll and Samwick 1997, Kazarosian 1997). Therefore, we analyze the magnitude of the volatility of permanent shocks to idiosyncratic income for households with heads of different risk aversion. In order to identify the volatility of permanent shocks to log-idiosyncratic household (head) income, we use a procedure proposed by Meghir and Pistaferri (2004) described in Appendix B. Essentially, the method uses a moment condition to identify the (unconditional) long-run variance of the first difference in idiosyncratic income under the assumption that the income process contains a random walk and a stationary component modeled as a moving average or an auto-regressive process.

We estimate the volatility of permanent shocks to idiosyncratic income for households with more risk averse heads and less risk averse heads separately. Specifically, we split our sample into two sub-samples based on the predicted values of risk aversion from our first stage regression of risk aversion on exogenous variables. The first sub-sample comprises household whose predicted values of risk aversion are above the 50th percentile. We label these households "more risk averse" households. The second sub-sample consists of households whose predicted values of risk aversion are below the 50th percentile. We label these households "less risk averse" households. We first estimate the volatility of permanent shocks to income assuming that the transitory component is white noise. The results are presented in columns (1)-(2) of Table 13 and Table 14 for head-of-household income and household income, respectively. Alternatively, we estimate the relation assuming the transitory component is a moving average process of order one, since there is some empirical evidence in favor of this specification (e.g., Abowd and Card 1989, Meghir and Pistaferri 2004). The results of these estimations are presented in columns (3)-(4) of Table 13 and Table 14.

Less risk averse households have larger volatility of permanent shocks to income. In other words, less risk averse individuals choose careers with more volatile income paths. The hypothesis that the volatility of permanent shocks is the same for heads with different degrees of risk aversion can be rejected at the 3 percent level for head's idiosyncratic labor income, and can be easily rejected at all reasonable levels of statistical significance for idiosyncratic household income. We conclude that risk aversion is negatively correlated with the volatility of permanent shocks to income and that the self-selection phenomenon emphasized in the precautionary savings literature is empirically relevant for this dataset.

4.2 Risk aversion and household portfolio composition

We now turn to the investigation of the effect of risk aversion on the composition of household portfolios. Standard portfolio composition models predict that higher risk aversion leads to a relatively lower demand for risky assets (e.g., Gollier 2004). To validate this prediction, we use household wealth data from the 1984, 1989, 1994 and 1999 wealth supplements of the PSID, and we analyze the effect of risk aversion on the share of stocks in households' portfolios. For robustness, we use three different measures for the size a household portfolio: gross assets, financial assets, and net worth exclusive of net business wealth. A priori, we expect to find the

clearest relation between risk aversion and the portfolio share in risky assets when the size of the portfolio is measured by financial assets alone. Non-financial assets are dominated by housing equity which is quite illiquid and net worth is a more problematic measure because it can be negative or close to 0.

For each year—1984, 1989, 1994, or 1999—the value of gross assets is calculated as the sum of the value of shares in stocks, mutual funds, or investment trusts, money in checking and savings accounts, money market funds, certificates of deposit, government savings bonds, treasury bills, other savings or assets, such as bonds, rights in a trust or estate, the cash value in a life insurance policy, valuable collections for investment purposes, and the gross value of the main residential property. Financial assets are calculated as gross assets less the gross value of housing. Business wealth is excluded. Further, we exclude business owners from the sample. We do this because business owners predominantly hold assets related to their own enterprizes (e.g., Gentry and Hubbard 2004) and, therefore, the study of business owners' portfolio choices requires a more careful modeling beyond the scope of this paper.

We regress household portfolio shares of risky assets on risk aversion and demographic controls. The main results for pooled IV-Tobit regressions with exogenous demographic controls are shown in columns (1)-(3) of Table 16. The results are estimated for a sample of PSID households whose heads are 24 years and older. It is likely that a household that holds a large fraction of wealth in stock one year also holds a large fraction 5 years later. In other words, there may be persistence in portfolio composition that makes it tenuous to assume that observations of the same household at different time periods are independent random variables (conditional on the regressors). The effect of such auto-correlation would be to bias the estimated standard errors if not taken into account. We, therefore, allow for lagged endogenous variables as regressors in Table 16. We find significant coefficients for these lagged controls with the holding of stock relative to financial assets showing the highest persistence (with a coefficient to the lagged stock share of 0.37) and the holding of stock relative to net worth showing little persistence.

Risk aversion is a significant determinant of household holdings of stocks—as also found by Barsky, Juster, Kimball, and Shapiro (1997). Age is a significant determinant of household stock holdings relative to financial and gross assets, and the age effect is hump-shaped. The 1994 dummy is statistically significant in all specifications. As a robustness check, in columns (4)-(6) of Table 16, we present the results of similar regressions, adding controls that are not exogenous

but are widely used in the literature (e.g., Maniaci and Weber 2002). The added controls are log average income and log net worth.[18] Real income and real net worth are averaged over 1984–1999, the years spanning our constructed portfolio measures. In these specifications, risk aversion negatively affects stock portfolio shares and is significant at the 1 percent level for stock holdings relative to household gross and financial assets. The results are qualitatively the same but the effect of risk aversion is smaller and not as significant as in the regressions that do not include net worth and average income as controls. Households with more educated heads hold larger shares in stocks. The coefficients on net worth and average income indicate that wealthier households have a larger proclivity to hold their wealth in stocks, which is a well-known result in the literature on household portfolios (e.g., Campbell 2006). A larger family size is associated with smaller holdings of stocks.

As a robustness check, we rerun the regressions in columns (1)-(3) of Table 16 for the sample of households with stable family composition over the same sample period. The relevant figures are presented in Table 17. The results for risk aversion are qualitatively the same; the differences are that the effect of risk aversion is larger yet less precisely estimated. The lower precision and the larger magnitude of the coefficient are both expected since we have a much smaller sample which contributes to the imprecision of our estimates and we have stable family units which provide a better signal for unveiling the relationship between risk aversion and stock holdings.

4.3 Risk aversion and business ownership

To further explore the relation between risky career choices and risk aversion, we analyze the incidence of business ownership, arguably a very risky household endeavor. Kihlstrom and Laffont (2003), in a general equilibrium model of firm formation, show that risk aversion determines an individual's choice between wage employment and entrepreneurship. In their model, entrepreneurs are less risk averse. Cramer, Hartog, Jonker, and Van Praag (2002) find that risk aversion is significantly negatively related to individual choices of self-employment—they use responses to a hypothetical lottery for a sample of Dutch households. We examine the effect of risk aversion on the incidence of business ownership. In the PSID, starting in 1969, heads report whether their households own a business or not. Column (1) in Table 18 presents results for

[18] Household income is the sum of labor income of the head and the spouse, and their combined transfer income, deflated by the BLS CPI with 1982–1984 as the base period. Net worth is collected from the wealth supplements in 1984, 1989, 1994 and 1999 and is also deflated.

a cross-sectional IV-probit regression of business incidence on instrumented risk aversion and household demographic controls. The dependent variable of the regression is equal to 1 if a household owns a business in any year during the 1969–1996 period and equal to 0 otherwise. In column (2), we add average household income and average net worth to the set of controls. In column (3), we report results for a pooled IV-probit regression of business incidence during the same time span—in this case we include multiple observations for the same household if the head reports owning a business in different years. Column (4) presents results for the pooled sample with the additional income and net worth controls. The effect of risk aversion on business incidence is negative and statistically significant in all specifications and it is robust to the inclusion of household wealth, which is likely to be an endogenous variable. Thus, less risk averse households are more likely to start up their own businesses and tolerate substantial entrepreneurial risks. Other significant variables are race and sex of the head. Black heads are, on average, less likely to own a business. For robustness, we perform the same regression analysis but using an indicator variable equal to 1 if a household head reports being self-employed. The results are shown in Table 19. In these regressions, the estimated coefficient on risk aversion is of the same sign and of comparable magnitude to the corresponding coefficient in the regressions with business ownership as the dependent variable. In summary, less risk averse heads are more likely to be self-employed and own a business. One caveat: we cannot rule out the possibility that, say, parental education affects the propensity to become self-employed or own a business through other channels which are correlated with risk aversion such as better knowledge of opportunities or unmeasured skills. To the best of our knowledge such caveats can be applied to all work that studies the effect of risk aversion.

In conclusion, we find that more risk tolerant households are more likely to choose careers with more volatile income streams and to own businesses or become self-employed. High risk aversion also predicts low shares of stocks in financial portfolios.

5 Conclusion

We examined determinants of risk aversion for households in the PSID. Growing up with more educated parents matters: children of educated parents are less risk averse in adulthood. Using compulsory schooling laws as instruments we showed that the effect of parental education is not just capturing attitudes and abilities of parents: policies that increase schooling will tend to

make future generations less risk averse.

We arrived at some other clear conclusions: older individuals and female heads of household are more risk averse, and more risk averse parents have more risk averse children. We found that risk aversion matters for observed economic behavior. Individuals with high risk aversion are less likely to choose careers with more volatile income streams, less likely to hold stocks in their portfolios, and less likely to become self-employed or to own businesses.

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Appendix A: List of Regressors

Age: age of the respondent at the time of the 1996 interview.

Black: dummy variable. 1 if the respondent reports being African-American.

Female: dummy variable. 1 if the respondent is female.

Father high school: dummy variable. 1 if the respondent's father has a high school degree or more education.

Mother high school: dummy variable. 1 if the respondent's mother has a high school degree or more education.

Father college: dummy variable. 1 if the respondent's father has a some college or more education.

Mother college: dummy variable. 1 if the respondent's mother has some college or more education.

Parents' edu/dummies sum: sum of the father and mother high school and college dummies.

Lived with both parents: dummy variable. 1 if the respondent reports he or she lived with both natural parents most of the time until age 16.

City: dummy variable. 1 if the respondent reports growing up in a large city as opposed to a farm, a small town or other location.

Lutheran-Baptist: dummy variable. 1 if the respondent reports his/her religious preference is Lutheran or Baptist.

Rich parents: dummy variable. 1 if the respondent reports parents were pretty well off while growing up, as opposed to poor or of average well-being.

Log county med. income: the log of median income in 1982 dollars in the county where the respondent grew up, when the respondent was 10.

County urb. pop %: urban population percentage in the county where the respondent grew up, when the respondent was 10.

% County college grads: percentage of the population 25 or older with college degrees in the county where the respondent grew up, when the respondent was 10.

Log county med. house val.: the log of the median house value in 1982 dollars in the county where the respondent grew up, when the respondent was 10.

County principal component: the principal component of the four previous variables.

Grew up in Midwest/South: dummy variable. 1 if the respondent grew up in either the Midwest or the South census regions.

Grew up in West: dummy variable. 1 if the respondent grew up in the West census region.

CA: the minimum years in school required before leaving school, in the state where the respondent's father grew up, when the respondent's father was 15 years.

CL: the minimum years in school required before work is permitted in the state where the respondent's father grew up, when the respondent's father was 15 years.

CA8: dummy variable. 1 if CA $\leq$ 8.

CA9: dummy variable. 1 if CA=9.

CA10: dummy variable. 1 if CA=10.

CA11: dummy variable. 1 if CA $\geq$ 11.

CL6: dummy variable. 1 if CL $\leq$ 6.

CL7: dummy variable. 1 if CL=7.

CL8: dummy variable. 1 if CL=8.

CL9: dummy variable. 1 if CL $\geq$ 9.

Own education (no. years): Number of years of education of the respondent.

Log income (avg. 1984-1996): mean of the respondent's log of real family income for the years 1984-1996 in 1982 dollars.

'Log' wealth (avg. 1984-1994): Mean of household 'log' wealth for the periods 1984, 1989, and 1994 (the PSID does not collect wealth annually). The measure includes housing wealth. By 'Log', we actually mean the following transformation: sign(wealth)$\times$ log(1+abs(wealth)). This transformation allows us to keep negative values of wealth.

Parents' risk tolerance: a dummy variable equal to 1 if either the respondent's father or the respondent's mother risk aversion is smaller than 1.5, and 0 otherwise. Thus, the dummy equals 1 if either parent's risk aversion corresponds to one of the three lowest values for risk aversion: 0.18, 0.43 and 1.46.

Yrs fam. owned business (7-13): the number of years the respondent's parents report owning a business while the respondent was 7 to 13 years of age.

Log fam. income (avg. 7-13): mean of the respondent's log of real family income when the respondent was 7 to 13 years of age in 1982 dollars.

State dummies/grew up: state dummies identifying the state where the respondent grew up as reported in retrospective questions.

Planning score: 1972 reported efficacy and planning. Variable V2939. It is a score from 0 to 6 constructed from the following questions:

- Sure life would work out (V2743 = 1)
- Plans life ahead (V2744 = 1)
- Gets to carry out things (V2745 = 1)

- Finishes things (V2746 = 1)
- Rather save for future (V2748 = 5)
- Thinks about things that might happen in future (V2755 = 1)

Parents' trust/hostility score: Reported trust or hostility in 1972. Variable V2940. Score 0-5. Constructed from the following variables:

- Does not get angry easily (V2751 = 5)
- Matters what others think (V2752 = 1, 2)
- Trusts most other people (V2753 = 1)
- Believes life of average man getting better (V2756 = 1)
- Believes there are not a lot of people who have good things they don't deserve (V2757 = 5)

Leader: A dummy variable equal to 1 if the parents report they would prefer to their child to be a leader vs. being popular with classmates. Variable V2760 in the 1972 interview.

IQ score: respondent's IQ score as calculated by the PSID staff from a sentence completion test administered in 1972. A point is given for each correct reply. Scores range from 0 to 13. Variables V2730-V2743 in the 1972 interview.

Parents hope college for kids: dummy variable equal to 1 if parents report they think all children will go to college in the 1972 interview. Answers 1 and 2 to question V2549, "About how much education do you think the children will have when they stop going to school?"

Appendix B: Estimating the volatility of permanent shocks

In order to identify the volatility of permanent shocks to log-idiosyncratic household (head) income, we use a procedure proposed by Meghir and Pistaferri (2004). It can be described as follows. Assume that log-idiosyncratic income, $\widetilde{y}_{it}$, consists of a permanent random walk component, τ_{it}, and a transitory moving average component, c_{it} (see Guiso, Pistaferri, and Schivardi (2005), Carroll and Samwick (1997), Hryshko (2006), Meghir and Pistaferri (2004) for empirical analysis of this income process on micro data and its empirical validation):

$$\widetilde{y}_{it} = \tau_{it} + c_{it}; \text{ with } \quad \tau_{it} = \tau_{it-1} + \epsilon^P_{it}, \quad c_{it} = \theta_q(L)\epsilon^T_{it}. \tag{1}$$

ϵ^P_{it} is a permanent shock to log-idiosyncratic income for household (head) i at time t; ϵ^T_{it} is a transitory shock to log-idiosyncratic income for household (head) i at time t; $\theta_q(L)$ is a polynomial in L of order q, with $\theta_0 = 1$. We assume that $\epsilon^P_{it} \sim iid(0, \sigma^2_P)$ and $\epsilon^T_{it} \sim iid(0, \sigma^2_T)$.

The unobserved components model described in equation (1) implies that the first difference in log-idiosyncratic household (head) income is $\Delta\tilde{y}_{it} = \epsilon^P_{it} + (1-L)\theta_q(L)\epsilon^T_{it}$. Meghir and Pistaferri

(2004) propose the following identifying condition for estimation of the volatility of permanent shocks to log-idiosyncratic income:

$$E\left[\Delta\tilde{y}_{it}\sum_{k=-(1+q)}^{(1+q)}\Delta\tilde{y}_{it+k}\right]=\sigma_P^2. \tag{2}$$

Essentially, this moment condition identifies the (unconditional) long-run variance of the first difference in income. It can be shown that the long-run variance is equal to the volatility of the permanent shock, σ_P^2, if the income process contains a random walk and a stationary component modeled as a moving average or an auto-regressive process. We estimate the volatility of permanent shocks to idiosyncratic household (head) income by the equally weighted minimum distance method (EWMD), calculating an empirical analog of the identifying condition in equation (2) for a sample of PSID households. The details of our sample selection are as follows. We select households with heads aged 24–65 and drop observations with an absolute percentage change in the income residual greater than or equal to 200 percent. Additionally, we drop observations with head's labor income below 1,000 (1982–1984) dollars. A household contributes an observation on income difference if it has a stable family composition between years t and $t-1$, where a household is classified to be stable if it has the same members in years t and $t-1$, or if a change occurs with members of the household other than the head and wife. Households with female and single heads are included in the sample. A household is present in the final sample if it has at least one non-missing income difference. The sample for studying the relationship between the volatility of permanent shocks to idiosyncratic head-of-household income and the head's risk aversion is selected in the same way, except that we do not impose the requirement of a stable family composition. Because of this requirement, we opted not to perform the analysis of Table 12 for household idiosyncratic income. Due to mobility of sample members within households, it is difficult to construct a good measure of the standard deviation of household income, preserving a relatively large sample for reliable statistical inference. The identification procedure of Meghir and Pistaferri (2004) is less stringent since it assumes that an observation on the first difference in idiosyncratic household income is identically distributed across individuals if a household has stable family composition only between years t and $t-1$, not during the extended period of time needed for construction of the standard deviation of income within a stable household unit.

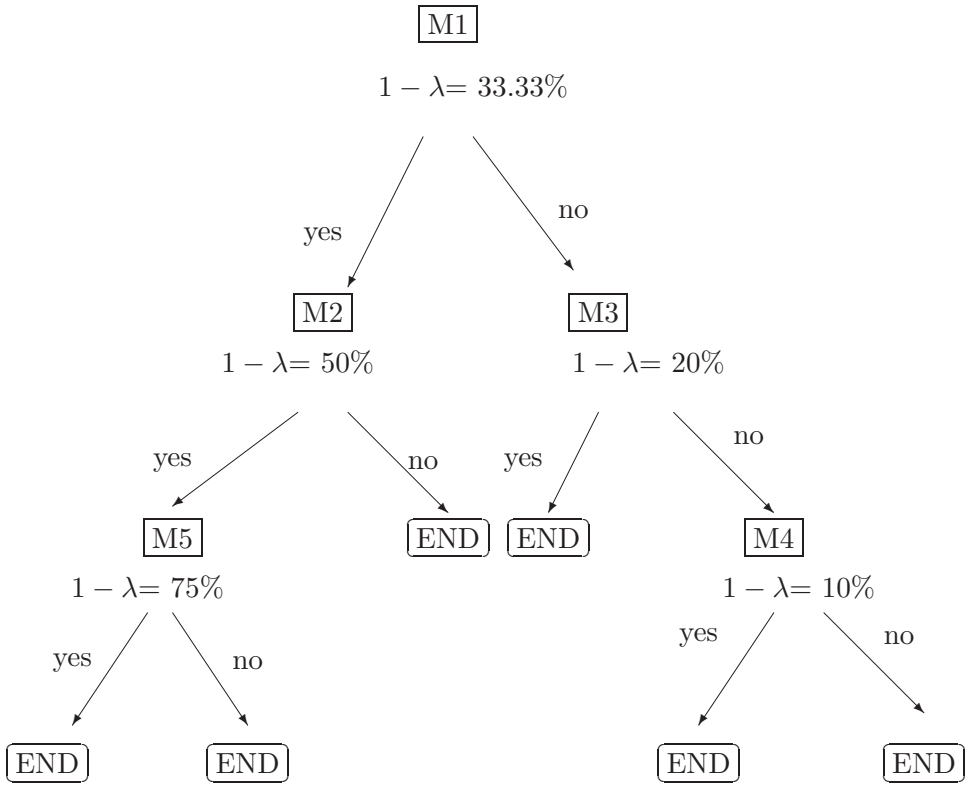

FIGURE 1: SEQUENCING OF QUESTIONS FROM THE 1996 PSID SUPPLEMENT ON RISK AVERSION

(Note: in all questions, the proposed job doubles income with 50 percent probability and cuts income by the varying fraction 1-λ.)

Table 1: Risk Aversion Mapping from the Survey Questions

		Relative Risk Aversion				
Group	Answers	lower bound	upper bound	mean	N	Percent
11	Yes/Yes/Yes	0	0.31	0.18	365	6.56
22	Yes/Yes/No	0.31	1	0.63	756	13.60
33	Yes/No/-	1	2	1.46	828	14.89
44	No/Yes/-	2	3.76	2.83	861	15.49
55	No/No/Yes	3.76	7.53	5.44	1,009	18.15
66	No/No/No	7.53	∞	33.9	1,741	31.31

Table 2: Summary statistics

Variable Name	Mean	Std. Dev.	Min.	Max.	N
Risk aversion	12.39	14.68	0.18	33.95	3722
Age	41.06	10.87	19	87	3722
Black	0.30	0.46	0	1	3722
Female	0.24	0.42	0	1	3722
Mother high school	0.65	0.48	0	1	3722
Father high school	0.56	0.50	0	1	3722
Mother college	0.24	0.43	0	1	3722
Father college	0.25	0.43	0	1	3722
Parents' edu./dummies sum	1.70	1.40	0	4	3722
Lived with both parents	0.78	0.41	0	1	3722
Lutheran-Baptist	0.38	0.49	0	1	3722
City	0.39	0.49	0	1	3708
Rich parents	0.27	0.44	0	1	3636
County med. income	19813	6904	1954	43062	3722
County urb. pop %	0.65	0.32	0	1	3722
% County college grad.	0.12	0.05	0.03	0.43	3722
County med. house value	40008	18325	3171	151340	3722
County principal component	0.02	1.67	–6.28	5.24	3722
Grew up in Midwest/South	0.71	0.46	0	1	3722
Grew up in West	0.12	0.33	0	1	3722
Own education (no. years)	13.25	2.33	3	17	3684
Log income (avg. 1984-1996)	10.04	0.86	2.59	12.79	3722
'Log' wealth (avg. 1984-1994)	4.41	3.06	–7.33	10.72	3661
Parents' risk tolerance	0.23	0.42	0	1	970
Yrs fam. owned business (7-13)	0.64	1.55	0	7	1401
Log fam. income (avg. 7-13)	10.10	0.74	4.75	12.61	1185
Parents' planning score	3.12	1.57	0	6	2100
Parents' trust/hostility score	2.45	1.29	0	5	2100
Leader	0.60	0.49	0	1	2100
Parents hope college for kids	.41	.49	0	1	2100
IQ score (respondent's)	9.46	2.40	0	13	2820

Notes: [1] Amounts in 1982-1984 dollars. Variable definitions in Appendix A.

Table 3: Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Risk aversion	1.00													
Parents' education	–0.17	1.00												
County prin.comp.	–0.19	0.37	1.00											
Age	0.20	–0.30	–0.57	1.00										
Black	0.09	–0.32	–0.06	–0.06	1.00									
Female	0.07	–0.06	–0.02	–0.01	0.25	1.00								
Lived with both parents	–0.05	0.06	–0.02	0.05	–0.20	–0.08	1.00							
Lutheran–Baptist	0.09	–0.18	–0.16	–0.04	0.37	0.09	–0.10	1.00						
Rich parents	–0.04	0.23	0.15	–0.17	–0.03	–0.01	0.05	–0.01	1.00					
Grew up in city	–0.03	0.09	0.42	–0.05	0.17	0.04	–0.10	–0.03	0.01	1.00				
Grew up in West	–0.06	0.16	0.20	–0.03	–0.14	–0.01	–0.05	–0.12	0.02	0.11	1.00			
Grew up Midwest/South	0.04	–0.19	–0.28	–0.02	0.28	0.05	–0.03	0.28	–0.03	–0.08	–0.57	1.00		
Compulsory schooling law	–0.11	0.22	0.28	–0.28	–0.23	–0.07	0.02	–0.18	0.06	0.04	0.05	–0.19	1.00	
Child labor law	–0.08	0.16	0.25	–0.29	–0.12	–0.04	0.01	–0.11	0.07	0.05	0.02	0.01	0.64	1.00

Table 4: Explaining Risk Aversion. OLS Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age	–0.18*	–0.30**	–0.27**	–0.29**	–0.30**	–0.30**	–0.31**	–0.30**
	(–1.82)	(–2.37)	(–2.11)	(–2.32)	(–2.41)	(–2.43)	(–2.48)	(–2.39)
Age sq./100	0.47***	0.54***	0.54***	0.57***	0.55***	0.55***	0.55***	0.53***
	(4.11)	(3.86)	(3.85)	(4.12)	(3.93)	(4.02)	(4.03)	(3.90)
Black	1.38**	1.03	1.23*	1.15*	1.08*	0.88	0.94	0.75
	(2.42)	(1.56)	(1.88)	(1.77)	(1.65)	(1.40)	(1.47)	(1.06)
Female	1.06**	1.61***	1.67***	1.64***	1.61***	1.69***	1.72***	1.59***
	(2.12)	(2.73)	(2.83)	(2.77)	(2.72)	(2.91)	(2.95)	(2.72)
Father high school	–0.20	0.04	–0.00	0.01	0.03			
	(–0.34)	(0.06)	(–0.00)	(0.02)	(0.05)			
Father college	–0.94	–1.23*	–1.15*	–1.10	–1.14*			
	(–1.59)	(–1.81)	(–1.68)	(–1.60)	(–1.67)			
Mother high school	–1.52**	–1.30**	–1.35**	–1.35**	–1.35**			
	(–2.57)	(–1.97)	(–2.06)	(–2.06)	(–2.06)			
Mother college	–1.18**	–1.45**	–1.43**	–1.42**	–1.44**			
	(–2.10)	(–2.26)	(–2.23)	(–2.21)	(–2.25)			
Lived with both parents	–1.13**	–1.12*	–1.13*	–1.20**	–1.14*	–0.99*	–1.06*	–1.02*
	(–2.05)	(–1.85)	(–1.87)	(–1.97)	(–1.88)	(–1.67)	(–1.78)	(–1.70)
City	–0.73	–0.40	0.06	–0.50	–0.28			
	(–1.63)	(–0.75)	(0.11)	(–0.98)	(–0.52)			
Lutheran-Baptist	1.18**	1.46***	1.52***	1.62***	1.46***	1.45***	1.61***	1.51***
	(2.48)	(2.65)	(2.77)	(2.97)	(2.65)	(2.68)	(2.95)	(2.69)
Rich parents	0.76	0.22	0.25	0.23	0.25			
	(1.58)	(0.41)	(0.45)	(0.42)	(0.47)			
Log county med. income		–1.80**						
		(–2.19)						
County urb. pop %			–2.56***					
			(–2.69)					
% County college grad.				–12.72***				
				(–2.75)				
Log county med. house val.					–1.75***			
					(–2.68)			
County principal component						–0.56***	–0.59***	–0.69***
						(–3.36)	(–3.32)	(–3.32)
Parents' edu./dummies sum						–0.87***	–0.86***	–0.85***
						(–4.60)	(–4.52)	(–4.39)
Grew up in Midwest/South							–1.35**	
							(–1.99)	
Grew up in West							–2.13**	
							(–2.55)	
Constant	12.67***	33.85***	16.28***	16.87***	34.60***	15.89***	17.31***	16.06***
	(5.72)	(3.80)	(5.65)	(5.76)	(4.45)	(5.64)	(5.99)	(5.66)
States dummies/grew up	No	No	No	No	No	No	No	Yes
Adj. R sq.	0.060	0.063	0.064	0.064	0.064	0.065	0.066	0.069
F	25.6***	20.7***	21.4***	21.3***	21.3***	34.5***	28.5***	29.5***
N	4542	3636	3637	3628	3636	3722	3716	3716

Notes: The left-hand side variable is the computed coefficient of relative risk aversion. Robust standard errors in the regressions. t-statistics in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 5: Explaining Risk Aversion. OLS Regressions. Robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age	–0.34***	–0.27**	–0.40***	–0.40***	–0.38***	–0.39***	–0.43***	–0.50***
	(–2.60)	(–2.01)	(–2.92)	(–3.07)	(–2.76)	(–2.85)	(–3.09)	(–3.14)
Age sq.	0.58***	0.51***	0.63***	0.62***	0.59***	0.61***	0.66***	0.72***
	(4.08)	(3.55)	(4.32)	(4.35)	(4.03)	(4.15)	(4.48)	(4.22)
Black	0.64	0.55	0.79	0.93	0.97	1.19*	0.98	0.41
	(0.88)	(0.76)	(1.07)	(1.27)	(1.32)	(1.80)	(1.37)	(0.50)
Female	1.61***	1.58***	1.93***	2.05***	2.36***	2.43***	2.39***	2.82***
	(2.68)	(2.64)	(3.01)	(3.36)	(3.65)	(3.75)	(3.65)	(3.99)
Lived with both parents	–1.10*	–1.01*	–1.14*	–1.19*	–1.12*	–1.19**	–1.21**	–1.51**
	(–1.80)	(–1.66)	(–1.88)	(–1.96)	(–1.85)	(–1.97)	(–1.98)	(–2.16)
Lutheran-Baptist	1.59***	1.50***	1.60***	1.60***	1.51***	1.54***	1.53***	1.64**
	(2.80)	(2.64)	(2.83)	(2.83)	(2.66)	(2.77)	(2.70)	(2.52)
Parents' edu./dummies sum	–0.86***	–0.65***	–0.91***	–0.88***	–0.67***	–0.66***	–0.65***	–0.83***
	(–4.36)	(–3.12)	(–4.56)	(–4.46)	(–3.21)	(–3.21)	(–3.12)	(–3.35)
County principal component	–0.62***	–0.58***	–0.64***	–0.62***	–0.59***	–0.52***	–0.38**	–0.67***
	(–2.99)	(–2.80)	(–3.06)	(–2.97)	(–2.82)	(–2.92)	(–1.96)	(–3.24)
Own education (no. years)		–0.34***			–0.43***	–0.44***	–0.45***	–0.42***
		(–2.87)			(–3.49)	(–3.61)	(–3.59)	(–2.91)
Log income (avg. 1984-1996)			0.51		0.57	0.58	0.67*	0.57
			(1.44)		(1.48)	(1.51)	(1.72)	(1.23)
Log wealth (avg. 1984-1994)				0.29***	0.28***	0.27***	0.25***	0.23**
				(3.50)	(3.20)	(3.12)	(2.90)	(2.29)
Grew up in Midwest/South						–1.21*	–2.82**	–1.37*
						(–1.76)	(–2.39)	(–1.68)
Grew up in West						–2.24***	–4.21***	–2.03**
						(–2.65)	(–2.91)	(–2.06)
IQ Score								–0.18
								(–1.24)
Constant	16.94***	19.38***	13.31***	17.55***	16.55***	17.89***	19.10***	23.08***
	(5.74)	(6.31)	(3.41)	(5.94)	(4.09)	(4.39)	(4.56)	(4.65)
State dummies/grew up	Yes	Yes	Yes	Yes	Yes	No	No	No
State dummies/current	No	No	No	No	No	No	Yes	No
Adj. R sq.	0.069	0.071	0.069	0.071	0.074	0.072	0.075	0.091
F	28.8***	26.4***	25.9***	27.9***	24.0***	24.2***	21.7***	20.83***
N	3614	3614	3614	3614	3614	3614	3614	2649

Notes: The left-hand side variable is the computed coefficient of relative risk aversion. Robust standard errors in the regressions. t-statistics in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 6: First Stage Regressions for IV-Estimation

	IV-1	IV-2	IV-3	IV-4	IV-5	IV-6
CA9	0.22***	0.29***	0.39***	0.36***	0.22***	0.19***
	(3.78)	(4.89)	(6.31)	(6.19)	(3.58)	(2.62)
CA10	0.10	0.13*	0.12	0.14*	0.18**	0.18*
	(1.34)	(1.65)	(1.50)	(1.80)	(2.21)	(1.86)
CA11	0.30***	0.33***	0.50***	0.46***	0.38***	0.26**
	(4.03)	(4.32)	(6.49)	(6.42)	(4.58)	(2.47)
CL7	–0.11*	–0.10	–0.16**	–0.15**	–0.27***	–0.29***
	(–1.67)	(–1.48)	(–2.29)	(–2.28)	(–3.81)	(–3.55)
CL8	0.07	0.16**	0.21***	0.16**	–0.06	–0.12
	(1.01)	(2.19)	(2.80)	(2.26)	(–0.82)	(–1.36)
CL9	–0.05	0.00	–0.06	–0.02	–0.12	–0.11
	(–0.60)	(0.02)	(–0.62)	(–0.28)	(–1.38)	(–1.06)
Age	–0.06***	–0.07***	–0.08***	–0.07***	–0.06***	–0.06***
	(–5.52)	(–5.91)	(–6.86)	(–7.16)	(–6.34)	(–5.71)
Age sq./100	0.04***	0.03***	0.05***	0.04***	0.03***	0.02**
	(3.41)	(2.79)	(4.05)	(3.82)	(2.78)	(2.06)
County principal component	0.18***					
	(12.76)					
Black	–0.80***	–0.77***				
	(–15.88)	(–14.88)				
Female	0.05	0.04	–0.11**	–0.08*	–0.02	–0.01
	(0.91)	(0.86)	(–2.19)	(–1.74)	(–0.52)	(–0.31)
Lived with both parents	0.09*	0.09*	0.22***	0.20***	0.17***	0.16***
	(1.82)	(1.75)	(4.30)	(4.13)	(3.42)	(3.40)
Lutheran-Baptist	–0.10**	–0.17***	–0.36***	–0.36***	–0.24***	–0.21***
	(–2.21)	(–3.70)	(–7.76)	(–8.31)	(–5.45)	(–4.69)
Grew up in Midwest/South	0.05	–0.14**	–0.24***	–0.24***		0.12
	(0.75)	(–2.43)	(–3.99)	(–4.38)		(1.25)
Grew up in West	0.29***	0.34***	0.37***	0.41***		0.55***
	(3.59)	(4.19)	(4.45)	(5.38)		(4.80)
Constant	3.54***	3.92***	3.88***	3.68***	3.63***	3.43***
	(12.74)	(14.23)	(13.91)	(15.97)	(15.88)	(13.96)
States dummies/grew up	No	No	No	No	Yes	No
States dummies/father grew up	No	No	No	No	No	Yes
Adj. R sq.	0.265	0.233	0.188	0.178	0.222	0.227
F (CA9 to CL9)	5.98***	10.09***	20.98***	18.66***	7.19***	4.01***
F	110.5***	96.7***	76.1***	84.6***	61.4***	54.0***
N	3515	3515	3515	4264	4264	4264

Notes: The left-hand side variable is parents' education (sum of dummies). CA9, CA10, CA11, CL7, CL8, CL9 are the dummies that capture compulsory schooling laws as proposed by Acemoglu and Angrist (2001) and defined in Appendix A. Robust standard errors in the regressions. t-stats in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 7: Explaining Risk Aversion. Instrumenting for Parents' Education

	OLS	IV-1	IV-2	IV-3	IV-4	IV-5	IV-6
Parents' edu./dummies sum	–0.91***	–2.37	–2.49	–2.33**	–2.99***	–4.95***	–6.11**
	(–4.60)	(–1.19)	(–1.64)	(–2.23)	(–2.75)	(–2.66)	(–2.31)
County principal component	–0.53***	–0.24					
	(–2.90)	(–0.57)					
Age	–0.39***	–0.48***	–0.48***	–0.48***	–0.39***	–0.49***	–0.56***
	(–2.97)	(–2.67)	(–2.93)	(–3.10)	(–2.96)	(–2.98)	(–2.92)
Age sq./100	0.66***	0.72***	0.73***	0.73***	0.63***	0.65***	0.68***
	(4.59)	(4.38)	(4.84)	(4.86)	(4.84)	(4.66)	(4.71)
Black	0.86	–0.42	–0.54				
	(1.32)	(–0.23)	(–0.38)				
Female	1.61***	1.68***	1.68***	1.59***	1.25**	1.09**	1.19**
	(2.68)	(2.75)	(2.78)	(2.64)	(2.40)	(2.01)	(2.12)
Lived with both parents	–0.93	–0.81	–0.80	–0.74	–0.67	–0.31	–0.21
	(–1.51)	(–1.27)	(–1.26)	(–1.13)	(–1.11)	(–0.47)	(–0.28)
Lutheran-Baptist	1.71***	1.54**	1.62**	1.55**	0.83	0.35	0.13
	(3.06)	(2.51)	(2.53)	(2.20)	(1.27)	(0.50)	(0.17)
Grew up in Midwest/South	–1.30*	–1.28*	–1.05	–1.09	–1.21*		–1.11
	(–1.87)	(–1.83)	(–1.46)	(–1.47)	(–1.74)		(–0.97)
Grew up in West	–1.83**	–1.46	–1.50	–1.54	–0.75		0.56
	(–2.09)	(–1.45)	(–1.50)	(–1.64)	(–0.83)		(0.28)
Constant	18.54***	24.06***	23.94***	23.26***	22.92***	26.97***	30.69***
	(6.12)	(3.00)	(3.37)	(4.31)	(4.50)	(3.54)	(3.41)
States dummies/father grew up	No	No	No	No	No	Yes	No
States dummies/grew up	No	No	No	No	No	No	Yes
Adj. R sq.	0.070	0.056	0.053	0.056	0.035	0.063	0.067
F	28.6***	25.5***	26.6***	29.4***	32.3***	40.77***	41.71***
N	3515	3515	3515	3515	4264	4264	4264

Notes: The left-hand side variable is the computed coefficient of relative risk aversion. Instruments: CA and CL dummies (for the respondent's father, when the respondent's father was 15 years old). Definitions in Appendix A. Robust standard errors in the regressions. t-statistics in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 8: Explaining Risk Aversion. Probit and Ordered Logit Results

	Probit	IV-Probit			Ologit	IV-Ologit		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parents' edu./dummies sum	–0.08***	–0.21**	–0.27***	–0.44***	–0.11***	–0.23*	–0.30**	–0.55**
	(–4.39)	(–2.17)	(–2.71)	(–2.69)	(–4.53)	(–1.82)	(–2.20)	(–2.48)
County principal component	–0.04**				–0.08***			
	(–2.56)				(–3.66)			
Age	–0.03**	–0.04***	–0.03**	–0.04***	–0.04**	–0.05**	–0.04**	–0.05***
	(–2.47)	(–2.66)	(–2.46)	(–2.68)	(–2.40)	(–2.49)	(–2.23)	(–2.60)
Age sq./100	0.06***	0.06***	0.05***	0.05***	0.08***	0.09***	0.07***	0.08***
	(3.85)	(4.12)	(4.06)	(4.16)	(3.67)	(4.00)	(3.96)	(4.14)
Black	0.08				0.10			
	(1.32)				(1.18)			
Female	0.14**	0.14**	0.11**	0.10**	0.20***	0.19**	0.15**	0.13**
	(2.55)	(2.55)	(2.34)	(2.07)	(2.59)	(2.52)	(2.37)	(2.01)
Lived with both parents	–0.10*	–0.08	–0.08	–0.04	–0.03	–0.02	0.00	0.05
	(–1.70)	(–1.34)	(–1.38)	(–0.74)	(–0.39)	(–0.20)	(0.01)	(0.60)
Lutheran-Baptist	0.16***	0.14**	0.07	0.03	0.22***	0.22**	0.16**	0.10
	(3.03)	(2.17)	(1.20)	(0.52)	(3.17)	(2.57)	(2.01)	(1.23)
Grew up in Midwest/South	–0.12*	–0.10	–0.12*		–0.15*	–0.09	–0.09	
	(–1.80)	(–1.49)	(–1.75)		(–1.75)	(–0.95)	(–0.97)	
Grew up in West	–0.19**	–0.17*	–0.09		–0.12	–0.09	–0.01	
	(–2.14)	(–1.78)	(–0.99)		(–1.06)	(–0.76)	(–0.09)	
State dummies/grew up	No	No	No	Yes	No	No	No	Yes
Pseudo R sq.	0.055	0.047	0.045	0.057	0.020	0.016	0.016	0.021
χ^2	226.6***	194.1***	225.5***	283.5***	214.2***	172.6***	206.4***	4587.8***
N	3515	3515	4264	4253	3515	3515	4264	4264

Notes: Instruments: Dummies for compulsory schooling laws (when the respondents' father was 15 years old). In the Probit specification the left-hand side variable is 1 if the respondent's risk aversion is the highest value and 0 otherwise. Robust standard errors in the regressions. t-statistics in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 9: Explaining Risk Aversion. Parents' Risk Tolerance in a Matched Sample

	OLS					Probit				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Parents' edu./dummies sum	–0.54					–0.07**				
	(–1.57)					(–2.18)				
Mother college		–1.79*	–1.52	–1.55	–1.56		–0.30***	–0.25**	–0.25**	–0.27**
		(–1.95)	(–1.59)	(–1.35)	(–1.30)		(–3.25)	(–2.51)	(–2.13)	(–2.21)
Parents' risk tolerance	–1.75*	–1.95**	–2.13**	–2.04	–2.23*	–0.24**	–0.24**	–0.28**	–0.37***	–0.38***
	(–1.72)	(–1.97)	(–2.04)	(–1.58)	(–1.75)	(–2.31)	(–2.33)	(–2.51)	(–2.66)	(–2.76)
County principal component				–1.34***	–1.36***				–0.10**	–0.10**
				(–2.70)	(–2.72)				(–1.97)	(–1.98)
Own education (no. years)					0.02					0.02
					(0.09)					(0.74)
Age	0.07	0.09	0.06	–0.02	–0.02	0.00	0.00	0.00	–0.01	–0.01
	(0.99)	(1.38)	(0.85)	(–0.19)	(–0.23)	(0.15)	(0.29)	(0.13)	(–0.55)	(–0.74)
Female	1.32	1.54	1.43	3.31**	3.42***	0.08	0.10	0.09	0.26**	0.26**
	(1.29)	(1.54)	(1.41)	(2.57)	(2.64)	(0.84)	(1.05)	(0.92)	(2.11)	(2.08)
Lived with both parents	–2.19*	–2.83**	–2.40**	–2.71**	–2.60*	–0.14	–0.20*	–0.20*	–0.25**	–0.26**
	(–1.82)	(–2.47)	(–2.04)	(–2.05)	(–1.94)	(–1.23)	(–1.90)	(–1.81)	(–2.03)	(–2.03)
Lutheran-Baptist	2.02**	2.01**	1.87*	1.90	1.84	0.11	0.10	0.12	0.08	0.08
	(2.00)	(2.06)	(1.86)	(1.54)	(1.48)	(1.15)	(1.06)	(1.23)	(0.71)	(0.70)
Regional dummies/grew up	Yes	Yes	No	No	No	Yes	Yes	No	No	No
State dummies/grew up	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Adj. R sq./pseudo R sq.	0.016	0.023	0.052	0.079	0.083	0.017	0.024	0.068	0.090	0.093
F	2.69***	3.44***	3.05***	4.28***	3.79***					
χ^2						20.49***	28.34***	82.92***	82.7***4	84.54***
N	859	891	891	664	657	859	891	885	660	653

Notes: Parents risk tolerance is a dummy variable equal to 1 if either the father of the mother reports a risk aversion lower than 1.5. In the OLS specification the left-had side variable is the computed coefficient of relative risk aversion. In the Probit specification the left-hand side variable is 1 if the respondent's risk aversion is one of the two highest values and 0 otherwise (roughly a 50-50 split of the sample). Robust standard errors in the regressions. t-statistics in parentheses. *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 10: Explaining Risk Aversion. Business Ownership and Family Income in a Matched Sample

	OLS				Probit		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parents' edu./dummies sum	–1.30***	–1.24***	–1.05***	–1.26***	–0.11***	–0.09***	–0.12***
	(–4.39)	(–4.36)	(–3.37)	(–3.88)	(–3.96)	(–3.18)	(–3.84)
County principal component	–1.07***	–1.08***	–1.07***	–0.93**	–0.10***	–0.10***	–0.07**
	(–2.81)	(–2.94)	(–2.88)	(–2.33)	(–2.90)	(–2.84)	(–1.98)
Yrs fam. owned business (7-13)		–0.42*	–0.41*		–0.06**	–0.06**	
		(–1.84)	(–1.75)		(–2.27)	(–2.20)	
Log fam. income (avg. 7-13)				–0.48			–0.03
				(–0.66)			(–0.42)
Black	–0.02						
	(–0.02)						
Age	0.02						
	(0.25)						
Female	2.06**	2.00**	2.24***	2.12**	0.24***	0.28***	0.26***
	(2.37)	(2.35)	(2.59)	(2.24)	(3.14)	(3.51)	(2.99)
Lived with both parents	–1.92**	–1.83**	–1.68*	–1.79	–0.10	–0.08	–0.13
	(–2.01)	(–1.99)	(–1.80)	(–1.62)	(–1.15)	(–1.01)	(–1.29)
Lutheran-Baptist	1.54*	1.45*	1.46*	1.11	0.06	0.06	0.03
	(1.70)	(1.68)	(1.68)	(1.17)	(0.70)	(0.80)	(0.36)
Own education (no. years)			–0.29			–0.02	
			(–1.39)			(–1.00)	
Constant	10.31**	11.66***	14.62***	14.66*	0.50	0.69*	0.68
	(2.54)	(3.87)	(3.87)	(1.90)	(1.40)	(1.68)	(0.93)
State dummies/grew up	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R sq./ pseudo R sq.	0.044	0.047	0.047	0.05	0.049	0.052	0.052
F	7.87***	9.81***	8.63***	5.83***			
χ^2					92.00***	95.31***	82.37***
N	1382	1386	1365	1194	1380	1359	1186

Notes: The two family level variables refer to the period when the risk aversion respondent was 7 to 13 years of age. In the OLS specification the left-hand side variable is the computed coefficient of relative risk aversion. In the Probit specification the left-hand side variable is 1 if the respondent's risk aversion is one of the two highest values and 0 otherwise (roughly a 50-50 split of the sample). Robust standard errors in the regressions. t-statistics in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 11: Explaining Risk Aversion. Parents' Attitudes in a Matched Sample (OLS)

	(1)	(2)	(3)	(4)
Parents' planning score	–0.25	–0.16	–0.11	
	(–1.06)	(–0.68)	(–0.47)	
Parents' trust/hostility score	–0.55*	–0.44	–0.49*	–0.56**
	(–1.93)	(–1.56)	(–1.73)	(–1.98)
Leader	–1.64**	–1.40*	–1.50**	–1.59**
	(–2.29)	(–1.94)	(–2.06)	(–2.20)
Parents hope college for kids	–1.34*	–1.01	–0.85	
	(–1.85)	(–1.37)	(–1.13)	
Parents' edu./dummies sum		–0.74**	–0.62**	–0.67**
		(–2.54)	(–2.01)	(–2.23)
County principal component	–1.06***	–0.94***	–0.88***	–0.88***
	(–3.39)	(–2.96)	(–2.76)	(–2.76)
Own education (no. years)			–0.20	–0.25
			(–1.10)	(–1.37)
Age	0.07	0.05	0.06	0.06
	(1.52)	(1.00)	(1.19)	(1.21)
Female	2.19***	2.31***	2.54***	2.59***
	(2.74)	(2.88)	(3.13)	(3.21)
Lived with both parents	–1.18	–1.15	–1.11	–1.21
	(–1.25)	(–1.23)	(–1.17)	(–1.29)
Lutheran-Baptist	1.30	1.29	1.25	1.28
	(1.59)	(1.57)	(1.52)	(1.56)
Black	0.51	0.04	0.11	0.13
	(0.49)	(0.04)	(0.10)	(0.12)
State dummies/grew up	Yes	Yes	Yes	Yes
Adj. R sq.	0.043	0.046	0.046	0.047
F	6.3***	6.7***	6.3***	7.5***
N	1810	1810	1786	1786

Notes: The left-hand side variable is the coefficient of relative risk aversion. Robust standard errors in the regressions. t-statistics in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 12: IV Regressions of Volatility of Head's Idiosyncratic Labor Income on Risk Aversion and Demographic Controls

	(1)	(2)
Risk aversion/10	–0.07***	–0.08***
	(–2.59)	(–2.92)
Black	0.05***	0.04***
	(3.51)	(3.01)
Female	–0.05***	–0.06***
	(–2.69)	(–2.97)
Age/10	–0.01	–0.00
	(–1.40)	(–0.65)
Age sq./100	0.92**	0.75*
	(2.08)	(1.65)
Own education (no. years)	–0.01***	–0.01***
	(–4.00)	(–2.80)
Married	–0.08***	–0.06***
	(–4.88)	(–3.41)
Family size	0.00	0.00
	(0.95)	(0.80)
Log net worth (avg. 1984–1994)		–0.10***
		(–3.98)
Log income (avg. 1990–1995)		–0.00*
		(–1.76)
Constant	0.69***	0.63***
	(6.42)	(5.69)
F	9.40***	11.34***
N	2522	2502

Notes: Income and demographic data are drawn from the 1969–1997 annual family files of the PSID. Idiosyncratic head's income is the residual from the cross sectional regression of household head's real income on education of the head, the household's state of residence, a second degree polynomial in the head's age, and head's race. For each year, cross sectional regressions are performed for seven age groups: heads of age 24–29, heads of age 30–35,..., heads of age 60–65. The sample is restricted to households with heads of age 24–65. Female and single heads are included. We drop observations with an absolute percentage change in income residual greater than or equal to 200% or with head's real labor income below 1,000 1982-1984 dollars. The standard deviation of idiosyncratic head's income is calculated for the heads with more than four observations on income residuals over the time span of 1969–1997. Average income is the average of the sum of head's and wife real income and their combined real transfer income over the time span of 1990–1995. Average real net worth is the average of the household net worth (exclusive of business net wealth) in 1984, 1989, and 1994. Instruments for risk aversion are the sum of the father and mother high school and college dummies; the county principal component to measure the quality of the 'neighborhood' where the head grew up; a dummy for the region where the head grew up; and a dummy for whether the head lived with both parents during childhood. Robust standard errors in the regressions. t-statistics in parentheses.

*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 13: The Volatility of Permanent Shocks Estimated from the Dynamics of Idiosyncratic Head's Labor Income. Sample Split by Predicted Values of Risk Aversion

	$q=0$		$q=1$	
	Less RA	More RA	Less RA	More RA
	(1)	(2)	(3)	(4)
St. dev. of permanent shocks, σ_P	0.32	0.28	0.30	0.26
	(0.02)	(0.005)	(0.02)	(0.006)
Goodness of fit	27.95	50.50	32.71	39.48
Degrees of freedom	25	25	25	25
p-value of the model	0.31	0.002	0.14	0.03
Number of households (N)	1669	1678	1669	1678
N×T	17181	25062	17181	25062
p-value for H_0 of no difference in perm. var. in (1) and (2)	1.0%			
p-value for H_0 of no difference in perm. var. in (3) and (4)	2.6%			

Notes: Households are split into two sub-samples. The first sub-sample consists of households below the 50th percentile of predicted risk aversion; the second sub-sample consists of households above the 50th percentile of predicted risk aversion. Predicted values of risk aversion are obtained from a regression of risk aversion on head's sex and race, a second degree polynomial in head's age, the sum of the father and mother high school and college dummies, the principal component for the county where the head grew up when he/she was a child, a dummy for the region where the head grew up, and a dummy for whether the head lived with both parents during childhood. For the unobserved components income model $\Delta\ \tilde{y}_{it} = \epsilon^P_{it} + (1-L)\theta_q(L)\epsilon^T_{it}$, σ_P—the standard deviation of the permanent shocks—is identified from the following moment condition (equation 5 in Meghir and Pistaferri (2004), p.8): $E[\Delta\tilde{y}_{it}\Sigma^{(1+q)}_{k=-(1+q)}\Delta\tilde{y}_{it+k}]$, where $\Delta\tilde{y}_{it}$ is the first difference in head's log-idiosyncratic income, ϵ^P_{it} is the permanent innovation, ϵ^T_{it} is the transitory innovation, and q is the pre-estimated order of the auto-covariance in the transitory component of log-idiosyncratic head's income (zero if $q=0$, one if $q=1$). The model is estimated by the equally weighted minimum distance (EWMD) method, where the weighting matrix is the identity matrix. We discard the empirical counterparts of the moment for the first and the last time periods of our sample, since we do not have enough data to form complete empirical moments for these periods. Data are drawn from the 1969–1997 annual family files of the PSID. Income data are residuals from cross-sectional regressions of real labor income of the head of a household on the head's education, the household's state of residence, second degree polynomial in the head's age, and race. For each year, cross sectional regressions are performed for seven age groups: heads of age 24–29, heads of age 30–35,..., heads of age 60–65. We restrict the sample to households with heads of age 24–65. Female and single heads are included. We drop observations with an absolute percentage change in income residual greater than or equal to 200% or with the head's real labor income below 1,000 1982–1984 dollars.

Table 14: The Volatility of Permanent Shocks Estimated from the Dynamics of Idiosyncratic Household Income. Sample Split by Predicted Values of Risk Aversion

	$q = 0$		$q = 1$	
	Less RA	More RA	Less RA	More RA
	(1)	(2)	(3)	(4)
St. dev. of permanent shocks, σ_P	0.26	0.21	0.24	0.19
	(0.01)	(0.004)	(0.01)	(0.005)
Goodness of fit	31.06	63.49	39.38	72.12
Degrees of freedom	25	25	25	25
p-value of the model	0.19	3.39×10^{-5}	0.03	1.85×10^{-6}
Number of households (N)	1637	1664	1637	1664
N×T	15161	23114	15161	23114
p-value for H_0 of no difference in perm. var. in (1) and (2)	0.0%			
p-value for H_0 of no difference in perm. var. in (3) and (4)	0.08%			

Notes: The specifications are identical to those of Table 13 substituting "household" for "head" everywhere. A household contributes an observation on income difference if it has a stable family composition between year t and year $t-1$. A household is present in our final sample if it has at least one non-missing income difference.

Table 15: Further Summary Statistics

Variable Name	Mean	Std. Dev.	Min.	Max.	N
St. dev. of head's idiosyncr. inc.	0.35	0.21	0.04	1.23	2522
Ever owned a business (1969–1996)	0.40	0.49	0	1	3363
Business incidence (1969–1996)†	0.16	0.36	0	1	46009
Ever self-employed (1969–1996)	0.26	0.44	0	1	3411
Self-employed (1969–1996)†	0.12	0.32	0	1	44510
Stock wealth relative to financial assets	0.21	0.33	0	1	2556
Stock wealth relative to gross assets	0.09	0.20	0	1	2878
Stock wealth relative to net worth	0.09	0.64	0	35	3723
Average household income/100*	326.19	180.29	28.06	1654.37	3699
Log average household income*	5.64	0.57	3.33	7.41	3699
Average net worth/100*	8198.44	14510.67	–3838.759	594633.30	3723
Log average net worth*	7.95	2.68	–8.25	13.30	3723
Family size*	3.01	1.44	1	9	3723
Own education (no. years)*	13.13	2.51	1	17	3723
Whether married*	0.66	0.47	0	1	3723

Notes: †Statistics defined for respective pooled cross-sections. *Statistics correspond to the sample used in column (3) of Table 16. Our measure of net worth excludes business wealth.

Table 16: Pooled IV-Tobit Regressions of Household Portfolio Share in Stocks on Risk Aversion and Demographics

	Stock/FA (1)	Stock/GA (2)	Stock/NW (3)	Stock/FA (4)	Stock/GA (5)	Stock/NW (6)
Risk aversion/10	–0.20***	–0.15***	–0.52**	–0.18***	–0.13***	–0.44*
	(–3.33)	(–3.82)	(–2.01)	(–2.78)	(–3.09)	(–1.78)
Black	–0.14***	–0.10***	–0.35**	–0.14***	–0.09***	–0.33**
	(–3.99)	(–4.36)	(–2.22)	(–3.91)	(–4.35)	(–2.20)
Female	–0.07	–0.05	–0.07	–0.05	–0.05	–0.04
	(–0.93)	(–1.18)	(–0.65)	(–0.70)	(–1.05)	(–0.39)
Age	0.03***	0.01***	0.04*	0.02**	0.01**	0.02
	(2.81)	(2.64)	(1.67)	(2.33)	(2.08)	(1.22)
Age sq./100	–0.02*	–0.01*	–0.02	–0.01	–0.01	–0.01
	(–1.93)	(–1.66)	(–1.09)	(–1.59)	(–1.24)	(–0.58)
Own education (no. years)	0.08***	0.05***	0.16**	0.07***	0.05***	0.14**
	(11.03)	(11.41)	(2.45)	(10.15)	(10.58)	(2.39)
Married	0.14**	0.04	0.32*	0.11*	0.01	0.21
	(2.50)	(1.08)	(1.66)	(1.91)	(0.40)	(1.30)
Family size	–0.04***	–0.03***	–0.07**	–0.05***	–0.03***	–0.08**
	(–2.95)	(–3.40)	(–2.02)	(–3.40)	(–3.90)	(–2.22)
1994	0.16***	0.09***	0.19**	0.17***	0.09***	0.23**
	(4.89)	(4.73)	(2.25)	(5.18)	(5.17)	(2.39)
1999	–0.07	–0.02	–0.25*	–0.03	0.00	–0.14
	(–1.62)	(–0.81)	(–1.83)	(–0.75)	(0.05)	(–1.37)
Stock/FA$_{t-1}$	0.37***			0.31***		
	(6.67)			(5.49)		
Stock/GA$_{t-1}$		0.22***			0.20***	
		(3.31)			(3.03)	
Stock/NW$_{t-1}$			0.02			0.01
			(1.43)			(0.49)
Log income (avg. 1984–1998)				0.09**	0.07***	0.23***
				(2.19)	(2.69)	(2.52)
Log net worth (avg. 1984–1999)				0.02**	0.01*	0.05**
				(2.33)	(1.91)	(2.09)
Constant	–1.77***	–1.08***	–3.36**	–2.25***	–1.41***	–4.58**
	(–8.31)	(–8.17)	(–2.27)	(–8.24)	(–8.73)	(–2.47)
Pseudo LL	–7066.23	–7207.63	–9288.73	–7012.65	–7137.29	–9202.75
χ^2	488.78***	378.09***	22.47**	513.00***	414.04***	12.26
N	2910	3271	3723	2893	3247	3699

Notes: In columns (1)-(2), the dependent variable is the ratio of household gross wealth in stocks to the value of household financial assets (FA); in columns (3)-(4)—the ratio of household gross wealth in stocks to the value of household gross assets (GA); in columns (5)-(6)—the ratio of household gross wealth in stocks to household net worth (NW) exclusive of business wealth. In the regressions of columns (3)-(6), we drop households with negative net worth. For each year—1984, 1989, 1994 or 1999—the value of gross assets is calculated as the sum of the value of stocks, mutual funds, investment trusts, money in checking and savings accounts, money market funds, certificates of deposit, government savings bonds, treasury bills, other savings or assets, such as bonds, rights in a trust or estate, cash value in a life insurance policy, valuable collections for investment purposes, and the gross value of main housing. Financial assets are calculated as gross assets less the gross value of housing. The instruments for risk aversion are the sum of the father and mother high school and college dummies; the principal component for the county where the head grew up when he/she was a child; a dummy for the region where the head grew up. Households that reported having a business in at least one year out of 1984, 1989, 1994 or 1999 have been removed from the sample. We restrict the sample to households with heads of age 24 and above. Clustering robust standard errors in the regressions. t-statistics in parentheses.

*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 17: Pooled IV-Tobit Regressions of Household Portfolio Share in Stocks on Risk Aversion and Demographics. Households with Stable Family Composition between 1984–1999

	Stock/FA (1)	Stock/GA (2)	Stock/NW (3)	Stock/FA (4)	Stock/GA (5)	Stock/NW (6)
Risk aversion/10	–0.32**	–0.19***	–0.85*	–0.27**	–0.15**	–0.74
	(–2.92)	(–3.17)	(–1.73)	(–2.36)	(–2.46)	(–1.49)
Black	–0.12**	–0.08***	–0.38*	–0.11**	–0.07***	–0.34*
	(–2.27)	(–2.83)	(–1.81)	(–2.22)	(–2.80)	(–1.74)
Female	0.03	0.00	–0.15	0.05	0.01	–0.08
	(0.26)	(0.01)	(–0.70)	(0.43)	(0.13)	(0.36)
Age	0.04**	0.02**	0.06*	0.03**	0.01*	0.03
	(2.56)	(2.47)	(1.66)	(1.98)	(1.85)	(1.10)
Age sq./100	–0.02*	–0.01	–0.03	–0.02	–0.01	–0.01
	(–1.80)	(–1.57)	(–1.07)	(–1.38)	(–1.13)	(–0.48)
Own education (no. years)	0.07***	0.05***	0.19**	0.06***	0.04***	0.16**
	(6.94)	(8.16)	(2.14)	(6.13)	(7.32)	(2.02)
Married	0.21*	0.06	0.37	0.14	0.02	0.20
	(1.95)	(1.05)	(1.27)	(1.27)	(0.37)	(0.78)
Family size	–0.07**	–0.04***	–0.18*	–0.07**	–0.04***	–0.18*
	(–2.50)	(–2.95)	(–1.81)	(–2.50)	(–2.99)	(–1.75)
1994	0.09**	0.05**	0.18	0.11***	0.06***	0.22*
	(2.27)	(2.45)	(1.58)	(2.65)	(2.89)	(1.79)
1999	–0.13**	–0.04	–0.40*	–0.11*	–0.03	–0.34*
	(–2.14)	(–1.27)	(–1.79)	(–1.84)	(–0.99)	(–1.67)
Stock/FA$_{t-1}$	0.39***			0.33***		
	(4.25)			(3.80)		
Stock/GA$_{t-1}$		0.23**			0.22**	
		(2.37)			(2.40)	
Stock/NW$_{t-1}$			0.01			–0.00
			(0.39)			(–0.10)
Log income (avg. 1984–1998)				0.09	0.06*	0.19
				(1.37)	(1.86)	(1.31)
Log net worth (avg. 1984–1999)				0.05***	0.02**	0.15**
				(2.60)	(2.25)	(2.00)
Constant	–1.72***	–1.03***	–3.76**	–2.30***	–1.40***	–5.19**
	(–4.91)	(–5.33)	(–2.18)	(–5.55)	(–6.27)	(–2.43)
Pseudo LL	–4277.39	–4304.41	–5640.57	–4230.55	–4248.59	–5573.35
χ^2	246.65***	201.54***	6.57	283.81***	243.38***	12.52
N	1772	1993	2197	1759	1976	2180

Notes: See notes to Table 16. Only households with stable family composition during 1984–1999 are included in this table. Clustering robust standard errors in the regressions. t-statistics in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 18: Pooled-IV Probit Regressions of Business Incidence on Risk Aversion and Demographics. Cross Sectional and Pooled Samples

	Business Incidence Cross Section		Business Incidence Pooled	
	(1)	(2)	(3)	(4)
Risk aversion	–0.06***	–0.05***	–0.04***	–0.04***
	(–8.00)	(–7.88)	(–3.23)	(–3.40)
Black	–0.25***	–0.26***	–0.47***	–0.43***
	(–2.60)	(–2.70)	(–4.90)	(–4.48)
Female	–0.36***	–0.35***	–0.33***	0.28**
	(–2.84)	(–2.85)	(–2.66)	(2.29)
Age/10	0.30*	0.08	0.58***	0.45***
	(1.76)	(0.43)	(4.35)	(3.38)
Age sq./100	0.00	0.02	–0.03*	–0.02
	(0.17)	(1.21)	(–1.77)	(–1.22)
Own education (no. years)	0.01	0.01	0.03*	0.03
	(0.89)	(0.62)	(1.75)	(1.43)
Married	0.03	0.00	0.14**	0.11*
	(0.39)	(0.01)	(2.53)	(1.87)
Family size	0.02	0.02	0.03**	0.03**
	(1.03)	(1.01)	(2.04)	(2.13)
Log income (avg. 1984–1994)		–0.01		–0.05
		(–0.29)		(–0.95)
Log net worth (avg. 1984–1996)		0.03***		0.05***
		(4.18)		(5.41)
Constant	–0.92	–0.38	–2.32***	–2.10***
	(–1.61)	(–0.63)	(–4.13)	(–3.30)
Time dummies	N/A	N/A	Yes	Yes
Pseudo LL	–15646.03	–15062.13	–205653.54	–204244.17
χ^2	1425.48***	1292.11***	1126.00***	1222.03***
N	3363	3234	46009	45728

Notes: In columns (1) and (2), the dependent variable equals one if the household owns a business in any year during 1969–1996 and equals zero otherwise. In columns (3) and (4), the dependent variable equals one in the years that the household owns a business and equals zero otherwise. In the cross-sectional regressions of columns (1) and (2), the independent variables are measured in 1996. In the pooled regressions of columns (3) and (4), the independent variables are measured as of the reporting year. The sample is restricted to households with heads of age 24 and above. The instruments for risk aversion are the sum of the father and mother high school and college dummies; the principal component for the county where the head grew up when he/she was a child, a dummy for the region where the head grew up, and a dummy for whether the head lived with both parents during childhood. Robust (clustering) standard errors in the (pooled) regressions. t-statistics in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table 19: Pooled IV-Probit Regressions of Being Self-Employed on Risk Aversion and Demographics. Cross Sectional and Pooled Samples

	Self-Employment Cross Section		Self-Employment Pooled	
	(1)	(2)	(3)	(4)
Risk aversion	–0.04***	–0.05***	–0.04**	–0.05***
	(–4.44)	(–6.43)	(–2.44)	(–3.83)
Black	–0.28***	–0.28***	–0.48***	–0.41***
	(–2.95)	(–3.06)	(–3.69)	(–3.24)
Female	–0.31***	–0.35***	–0.31**	–0.29*
	(–2.68)	(–2.97)	(–2.03)	(–1.88)
Age/10	0.34**	0.22	0.39***	0.28**
	(1.99)	(1.15)	(2.77)	(2.07)
Age sq./100	–0.00	0.01	–0.00	0.00
	(–0.02)	(0.49)	(–0.24)	(0.09)
Own education (no. years)	–0.02	–0.00	–0.01	0.00
	(–1.52)	(–0.12)	(–0.39)	(0.03)
Married	–0.13	–0.04	0.09	0.13**
	(–1.59)	(–0.56)	(1.33)	(2.14)
Family size	0.03*	0.03*	0.02	0.02
	(1.75)	(1.78)	(1.28)	(1.17)
Log income (avg. 1984–1994)		–0.23***		–0.25***
		(–3.95)		(–3.57)
Log net worth (avg. 1984–1996)		0.03***		0.07***
		(3.83)		(4.54)
Constant	–1.03*	0.24	–1.70***	–0.45
	(–1.80)	(0.47)	(–2.60)	(–0.78)
Time dummies	N/A	N/A	Yes	Yes
Pseudo LL	–15692.25	–15102.65	–196547.32	–195210.23
χ^2	478.57***	615.97***	712.54***	1007.58***
N	3411	3283	44510	44268

Notes: The specifications are identical to those of Table 17 with "self-employed" substituted for "owns a business" everywhere. Robust (clustering) standard errors in the (pooled) regressions. t-statistics in parentheses.
*** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.