Internet Appendix for
"Who are the Value and Growth Investors?"

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This Internet Appendix provides a detailed description of the empirical methodology, verifies the robustness of our empirical results to alternative assumptions, and presents a full-fledged version of the equilibrium model of household portfolio value tilts discussed in the main text.

The roadmap is the following. Section I presents a detailed review of the literature. Section II describes the construction of variables and reports additional summary statistics on the cross-sectional distribution of the value loading. Section III considers alternative definitions of the value ladder and the set of explanatory variables. Section IV expands our analysis of labor income risk hedging. Sections V and VI further examine how our results relate to, respectively, risk-based and sentiment-based explanations of the value premium. Section VII reports a battery of robustness checks. Finally, Section VIII develops the equilibrium model of household portfolio tilts.

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I Literature Review (Appendix to Section 1)

The Introduction of the main text briefly summarizes the literature on the value premium. We now provide a more detailed review. The value premium is one of the best documented facts in asset pricing, which has proven to be remarkably persistent over time and across markets.[1] These strong empirical findings have received a number of theoretical explanations.

I.A Systematic Risk

Fama and French (1992, 1995) propose that the value premium is a compensation for a form of systematic risk other than market portfolio return risk. Several possibilities have been considered for the precise nature of this alternative risk (Cochrane 1999). Unlike growth stocks, value stocks exhibit high sensitivity to aggregate *labor income* and *consumption* shocks. Conditional versions of the CAPM and the C-CAPM based on these variables have therefore had success in explaining the value premium (Jagannathan and Wang 1996, Lettau and Ludvigson 2001, Petkova and Zhang 2005).[2,3] Value stocks are also highly exposed to long-run macroeconomic risk (Bansal, Dittmar, and Lundblad 2005, Gulen, Xing, and Zhang 2011, Hansen, Heaton, and Li 2008),[4] or displacement risk (Garleanu, Kogan, and Panageas 2012, Kogan, Papanikolaou, and Stoffman 2013).

The excess returns of value stocks over growth stocks are informative about changes in investment opportunities. Under the Intertemporal Capital Asset Pricing Model (ICAPM, Merton 1973), a factor that forecasts the distribution of future returns also explains the cross-section of

[1] See Asness, Moskowitz, and Pedersen (2013), Ball (1978), Basu (1983), Capaul, Rowley, and Sharpe (1993), Chan, Hamao, and Lakonishok (1991), Fama and French (1993, 1996, 2012), Griffin (2003), Liew and Vassalou (2000), and Rosenberg, Reid, and Lanstein (1985). Some recent work also shows that the strength of the value premium can be improved by refining the sorting methodology (Asness and Frazzini 2013, Barras 2013, Hou, Karolyi, and Kho 2011).

[2] Eiling (2013), Jagannathan, Kubota, and Takehara (1998), Addoum, Korniotis, and Kumar (2013), and Santos and Veronesi (2006) provide further evidence on the relationship between labor income and the value premium. See also Parker and Julliard (2005), Lustig and van Nieuwerburgh (2005), and Yogo (2006) for additional C-CAPM models connecting the value premium to aggregate consumption risk.

[3] Some recent studies, however, bring into question the ability of the conditional CAPM (and the conditional consumption CAPM) to explain the value premium. See Lewellen and Nagel (2006), Nagel and Singleton (2011), Ang and Kristensen (2012), and Roussanov (2013).

[4] See also Bansal, Kiku, Shaliastovich, and Yaron (2014) and Bansal, Dittmar, and Kiku (2009).

risk premia, as Campbell (1996b) emphasizes. Good realizations of the factor are associated with an improvement in investment opportunities. Assets with a negative loading on the factor thus provide a hedge against worsening investment opportunities. Consistent with the logic of the ICAPM, good realizations of the value factor predict high aggregate returns (Campbell and Vuolteenaho 2004) and economic growth (Koijen, Lustig, and Van Nieuwerburgh 2014, Liew and Vassalou 2000) in U.S. and international data. Growth stocks can therefore act as a hedge against adverse financial and economic conditions.

Decompositions of market portfolio returns into cash-flow news and discount-rate news support fundamentals explanations of the value premium (Campbell and Vuolteenaho 2004). Value stocks have considerably higher exposure to the market's cash-flow risk (bad beta) and lower exposure to the market's discount-rate risk (good beta) than growth stocks. In particular, value stocks are strongly exposed to deep recessions and the persistent reductions in aggregate cash flows that they entail (Campbell, Giglio, and Polk 2013). The poor performance of value strategies during the Great Financial Crisis provides recent evidence that value strategies are indeed highly exposed to deep recession risk. Furthermore, the value loadings of individual stocks are primarily driven by their own cash flows, which confirms that the value premium is rooted in fundamentals (Campbell, Polk, and Vuolteenaho 2010). Overall, the empirical asset-pricing evidence suggests that value stocks are exposed to forms of systematic risk other than market portfolio return risk, which can explain, at least partly, the value premium.

I.B Timing of Cash Flows and Production Risks

The different exposures of value and growth stocks to aggregate risk can be explained by the timing of their cash flows and the dynamics of their production processes. It is for instance well known that value stocks have shorter durations than growth stocks (Cornell 1999, Dechow, Sloan, and Soliman 2004). Consequently, value stocks exhibit low sensitivity to discount-rate risk and high sensitivity to cash-flow risk (Lettau and Wachter 2007), which is consistent with the evidence in Campbell and Vuolteenaho (2004).

Structural production-based asset pricing models have also had success in relating the sensitivity of a firm's traded equity to the firm's physical assets and growth options (Berk, Green, and Naik 1999, Gomes, Kogan, and Zhang 2003). Cutting physical capital in bad times entails more adjustment costs that expanding physical capital in good times. Assets in place are therefore riskier than growth options, especially in bad times when the price of risk is high. As a result, value stocks are more sensitive than growth stocks to the business cycle (Zhang 2005).[5]

Human capital is a key complement of physical capital in the production process and is known to explain the value premium in a conditional CAPM context (Jagannathan and Wang 1996). For this reason, researchers have recently developed structural asset-pricing models that explicitly incorporate human capital (Garleanu, Kogan, and Panageas 2012, Parlour and Walden 2011). Sylvain (2013) develops a general equilibrium model with both human and physical capital investment and shows that value stocks endogenously exhibit a high sensitivity to human capital risk.

I.C Cognitive Biases

The success of value investing can also originate from the exuberant overpricing of growth stocks and underpricing of value stocks by irrational investors (DeBondt and Thaler 1985, Lakonishok, Shleifer, and Vishny 1994).[6] These mistakes can be explained by the representativeness heuristic uncovered in the psychological literature, that is the tendency to pay more attention to recent events than Bayesian updating would imply (Kahneman and Tversky 1973). In the context of equity markets, companies that have recently performed well tend to be overpriced growth or "glamour" stocks, while companies that have recently performed poorly tend to be underpriced value stocks.

Overconfidence, that is the tendency to overestimate the accuracy of available information, is a complementary explanation of the cross-section of returns. Overconfident investors overprice

[5] Related channels include operational leverage (Carlson, Fisher, and Giammarino 2004), investment-specific technology (Kogan and Papanikolaou 2014), and the cyclicality of the demand for durable goods (Gomes, Kogan, and Yogo 2009).

[6] See also Barberis and Thaler (2003), La Porta, Lakonishok, Shleifer, and Vishny (1997), and Shleifer (2000).

stocks following positive news and underprice stocks following negative news, so that valuation ratios can predict future returns (Daniel, Hirshleifer, and Subrahmanyam 2001). These behavioral interpretations are consistent with biases in stock analyst expectations (La Porta 1996, La Porta, Lakonishok, Shleifer, and Vishny 1997, Greenwood and Shleifer 2014, Skinner and Sloan 2002) and with the pricing impact of measures of investor sentiment (Baker and Wurgler 2006).

II Data and Summary Statistics (Appendix to Section 2)

II.A Asset Data and Construction of Local Factors

We use stock market data for the 1985 to 2009 period provided by FINBAS, a financial database maintained by the Swedish House of Finance. The universe of assets consists mostly of Swedish mutual funds and all the stocks listed on Swedish, Danish, Norwegian, and Finnish exchanges. We also use Datastream to compute free-float adjusted market shares.

The construction of the factors is based on stocks worth more than 1 Swedish krona with at least 2 years of available data. The Swedish krona traded at 0.1371 U.S. dollar on 30 December 2003, so our threshold filters out very small stocks. We end up with a set of approximately 1,000 stocks, out of which 743 stocks are listed on one of the four major Nordic exchanges in 2003.[7] Table IA.1 provides a brief description of data availability for these four exchanges.

The FINBAS database includes monthly returns, market capitalizations at the semiannual frequency, and book values at the end of each year.[8] The book-value data include the tax reserve allocations that are provided by the Swedish government to help corporations smooth their tax payments over time. We accordingly add 100% of taxed reserves and 74% of untaxed reserves to reported book equity, which corresponds to a corporate tax rate of 26%.

[7] The major Nordic exchanges are the Stockholm Stock Exchange, the Copenhagen Stock Exchange, the Helsinki Stock Exchange, and the Oslo Stock Exchange.

[8] When a stock is listed on multiple exchanges, we eliminate duplicate return observations by using the following set of rules. First, we give priority to return data from the four major Nordic exchanges. Second, we select the exchange(s) for which the book and market values of the stock are both available. Third, if multiple exchanges satisfy the former criteria, we select the return data from the Stockholm Stock Exchange.

The return on the market portfolio is proxied by the SIX return index (SIXRX), a value-weighted index that tracks the aggregate value of all stocks listed on the Stockholm Stock Exchange. The risk-free rate is proxied by the monthly average yield on the one-month Swedish Treasury bill provided by Sveriges Riksbank. The excess return between the market portfolio and the risk-free rate defines the market factor MKT_t.

We construct the local value, size, and momentum factors by following the methodology of Fama and French (1993) and Carhart (1997). That is, we sort the stocks listed on the four major Nordic exchanges into 3 book-to-market portfolios: Low (L), Medium (M), and High (H). The value portfolios are constructed at the end of each December using December book-to-market ratios, with breakpoints equal to the 30th and 70th percentiles. Similarly, we sort the stocks listed on the four major Nordic exchanges into 2 size portfolios: Small (S) and Big (B). The size portfolios are constructed at the end of each June using the end-of-June market equity and a median breakpoint. The momentum portfolios (Low and High) are constructed at the end of each June using the return over the previous 12 months and contain portfolios in the first and tenth deciles. We next define SL_t, SM_t, SH_t, BL_t, BM_t, and BH_t as the returns on the equally-weighted portfolios of all the stocks in each size and book-to-market category. Finally, we define the size factor as $SMB_t = 1/3(SL_t + SM_t + SH_t) - 1/3(BL_t + BM_t + BH_t)$, the value factor as $HML_t = 1/2(SH_t + BH_t) - 1/2(SL_t + BL_t)$, and the momentum factor as the difference between the high and low momentum portfolio returns.

The value premium is substantial in Sweden. Table IA.2 reports summary statistics on the factors over the 1985 to 2009 period. The average return on the HML portfolio is 0.81% per month (excluding transaction costs). This corresponds to an average return of about 10% per year, with a 95% confidence interval between 5% and 15%. These values are consistent with the Sweden estimates in Fama and French (1998) and are also in line with the range of international estimates reported in Liew and Vassalou (2000). The table also shows that the average return on the momentum portfolio MOM_t is significantly positive, while the average return on the size portfolio is insignificant.

Table IA.3 reports the results of simple CAPM regressions applied to six portfolios of stocks sorted by book-to-market and size (Panel A), and two momentum portfolios (Panel B). Alphas and betas are estimated over the full sample period. Consistent with earlier evidence,[9] value stocks have positive CAPM-alphas and have lower market betas than growth stocks.

In Table IA.4, we test if the value factor can predict future economic growth, as in the empirical work of Liew and Vassalou (2000). We regress the annual growth of Gross Domestic Product (GDP) in year $y+1$ on (i) the annual return on the HML portfolio in year y, (ii) the annual return on the market, size, and momentum factors in year y, and (iii) other macro-economic variables in year y. The latter include the short-term interest rate, the term spread, and the growth rate of industrial production. We observe that in most specifications, the value factor predicts future economic growth, which confirms the international evidence in Liew and Vassalou (2000).[10]

In Table IA.5, we show that the value factor can also be used to predict per-capita income growth, the macro factor considered in Section 4 of the main text. Our analysis is based on the LAPS database, a census survey on wages, payroll taxes, and preliminary income tax compiled by Statistics Sweden. We use quarterly data on aggregate income in the private sector, which are publicly available online from 2001 onwards. The value factor predicts both future GDP growth and future income growth.

Overall, the value factor has the same properties in Sweden as in other countries. The value premium is significantly positive and in the range of international estimates reported in Fama and French (1998) and Liew and Vassalou (2000). Value stocks have positive CAPM-alphas and have lower market betas than growth stocks. Furthermore, the good performance of HML is a predictor of future economic growth and income, as the ICAPM suggests. We can therefore reliably use the Swedish household panel to analyze the determinants of value and growth investing.

[9]For instance, Fama and French (1998) show that the value factor helps to explain Swedish stock returns.

[10]Campbell (1996a) and Campbell and Shiller (1998) show that similar patterns of stock market predictability are evident in a panel of countries, including Sweden.

II.B Estimating Asset Loadings

We index time by t and stocks and funds by $i \in \{1,\ldots,I\}$. For every asset i, we estimate the four-factor model:

$$r^e_{i,t} = a_i + b_i MKT_t + v_i HML_t + s_i SMB_t + m_i MOM_t + u_{i,t},$$

where $r^e_{i,t}$ is the monthly excess return on asset i and $u_{i,t}$ is an idiosyncratic return uncorrelated to the factors. The factors are defined at dates $t = 1,\ldots,T$, but many assets are not observed at every t. The estimation follows the standard procedure summarized below.

- We compute

$$W_F = \frac{1}{T}\sum_{t=1}^{T} f_t f_t',$$

  where $f_t = (1, MKT_t, HML_t, SMB_t, MOM_t)'$.

- Let $t_i+1,\cdots,t_i+T_i$ denote the dates when returns on asset i are observed. We estimate the vector of coefficients $\gamma_i = (a_i, b_i, v_i, s_i, m_i)'$ by regressing the asset's excess returns on the factors:

$$\gamma_i = W_F^{-1}\left(\frac{1}{T_i}\sum_{t=t_i+1}^{t_i+T_i} f_t' r^e_{i,t}\right).$$

  The estimated loadings are winsorized at -5 and +5.

We use this method to compute the loadings of stocks and funds with at least 3 months of available data.

II.C Link Between the Value Loading and Other Firm Characteristics

We now investigate the extent to which the value loading correlates to firm characteristics that are easily observable to investors. We consider: the price-to-earnings ratio (P/E), the book-to-market ratio (B/M), financial leverage (D/A), the return on equity (ROE), and the dividend yield. The

P/E ratio is the share price divided by the per-share after-tax net profit.[11] The book-to-market ratio is defined in Section *II.A* of this Internet Appendix. Financial leverage is defined as the ratio of the book value of debt to the sum of the market value of equity and the book value of debt. The ROE is the ratio of after-tax net profit to the previous year's book value of equity.[12] Finally, the average annual dividend yield of each stock is computed as follows. We require a minimum of two annual observations, winsorize the annual dividend yield at 10%, and then compute for each stock the average dividend yield between 1999 and 2007. For each characteristic, we conduct the analysis over the subset of Swedish firms for which sufficient information is available to conduct the computations described above.

Table IA.6, Panel A, reports the median of each characteristic in 2003, as well as the number of firms for which the characteristic is available. We also report the Spearman correlation between the value loading and each characteristic across all the stocks in 2003. The correlations are generally between 0.3 and 0.6 in absolute value. These estimates are consistent with Chordia, Goyal, and Shanken (2015)'s evidence on U.S. stocks between 1963 and 2013.

Panel B reports the average percentile of each statistic for four portfolios of stocks by value loading. There is a clear monotonous relation between the value loading and each characteristic. Value stocks have greater book-to-market ratios, lower P/E ratios, higher leverage, lower ROE, and higher dividend yields compared to growth stocks. The results are consistent with the correlations in Panel A and with U.S. evidence (Chen and Zhang 1998, Fama and French 1993, 1995).

II.D Household Panel Data

The Swedish Income and Wealth Registry is an administrative dataset compiled by Statistics Sweden. Income and demographic variables, such as age, gender, marital status, nationality, birthplace, education, and municipality of residence, are available on December 31 of each year

[11] If the company has multiple classes of shares, the P/E ratio is first defined at the stock level, and we then compute a market-value weighted average for each firm. If the after-tax net profit is negative then the P/E ratio is set to missing.

[12] As with the P/E ratio, the ROE is set to missing if the after-tax net profit is negative, or if the book value of equity is negative.

from 1983 to 2007. For tax purposes, Statistics Sweden and the tax authority had until 2007 a parliamentary mandate to collect highly detailed *wealth* information on every resident. The disaggregated wealth data include the worldwide assets owned by each resident at year-end between 1999 and 2007. Real estate, debt, bank accounts, and holdings of mutual funds and stocks are provided for each property, account or security. Statistics Sweden provides a household identification number for each resident, which allows us to group residents by living units.[13] The household head in a given year is defined as the adult with the highest income during the year.

Our core results are based on a representative sample which we construct as follows.

- We draw 500,000 random individuals from the entire population of residents between 1999 and 2007.
- We select residents between 25 and 85 who head households that participate in the stock market in at least one year over the 1999-2007 sample period.
- We construct household variables for the living units of these residents. Measures of individual income and wealth are aggregated at the household level. Age, gender, education, unemployment, self-employment, and immigration status refer to the household head.
- We keep households that satisfy the following financial requirements: disposable income is strictly positive, financial wealth is at least 1,000 kronor (approximately $140), and total wealth is at least 3,000 kronor (approximately $420).
- We exclude households that satisfy at least one of the following criteria: i) household status is missing for one of the household members, ii) a household-level variable is missing, iii) financial wealth is in the top 0.01% of all remaining observations, or iv) the leverage ratio, defined as the households total debt divided by the households financial and real estate wealth, is higher than 10.
- We exclude households with less than five years of household income data.

[13] In order to protect privacy, Statistics Sweden provided us with a scrambled version of the household identification number.

This method produces an unbalanced panel of 589,561 household-year observations from 1999 to 2007, or approximately 70,000 households per year.

In Section 7 of the main text, we also use data from the Swedish Twin Registry, which is administered by the Karolinska Institute in Stockholm. The registry provides the genetic relationship (fraternal or identical) of each twin pair, and the intensity of communication between the twins. The twin database allows us to identify twin siblings in the Swedish Income and Wealth Registry. We select pairs such that the household of each twin in the pair meets the requirements described above. We end up with a panel of 104,522 observations from 1999 to 2007. In our twin panel, age, gender, unemployment, self-employment, education, and immigration status refer to the twin in the household.

II.E Bank Account Imputation

In Section 2.3.1 of the main text, cash is defined as the sum of bank of account balances and Swedish money market funds. Financial institutions are only required to report the bank account balance at year-end if the account yields more than 100 Swedish kronor during the year (1999 to 2005 period), or if the year-end bank account balance exceeds 10,000 Swedish kronor (2006 and 2007). Calvet, Campbell, and Sodini (2007) report that the imputation problem affects 2,000,000 of the 4,800,000 households in 2002.

When the balance is unreported, we impute it by following a refinement of the methodology in Calvet, Campbell, and Sodini (2007, 2009a, 2009b) and Calvet and Sodini (2014). The method relies on the subsample of individuals for which we observe the bank account balance. We regress the log bank account balance on the following characteristics: age and squared age of household head, household size, log real estate wealth, log household disposable income, square of log household disposable income, and log of financial assets other than bank account balances. We use the regression to estimate the account balances of individual household members, and then impute the household bank account balance by adding up individual estimates. In this procedure, we adjust the intercept of the imputation regression so that the aggregate value of observed and imputed bank account balances in our household panel matches the official aggregate bank account balance of the household sector reported by Statistics Sweden.

II.F Labor Income

We use income data from the Swedish Income and Wealth Registry for the 1983 to 2007 period. Our measure of income for each *individual* is non-financial real disposable income; we convert it to 2000 Swedish kronor prices using the consumer price index published by Statistics Sweden. We compute yearly *household* income by adding up the income earned by all household members in a given tax year. Several filters guarantee the reliability of the results. First, we eliminate years in which the household head is classified as a student. Second, we exclude observations in which the household income is either missing, lower than 6,000 kronor (approximately $840), or ranked in the top 0.05% observations of the sample. Third, we keep only the most recent series of consecutive observations and exclude the first year of the remaining series.[14]

We consider a labor income specification based on Carroll and Samwick (1997) that accounts for the persistence of income shocks. Specifically we assume that the real income of household h in year t, denoted by $L_{h,t}$, satisfies:

$$\log(L_{h,t}) = a_h + b' x_{h,t} + \theta_{h,t} + \varepsilon_{h,t}, \tag{IA-1}$$

where a_h is a household fixed effect, $x_{h,t}$ is a vector of age and retirement dummies, $\theta_{h,t}$ is a persistent component, and $\varepsilon_{h,t}$ is a transitory shock distributed as $\mathcal{N}(0, \sigma^2_{\varepsilon,h})$. The persistent component $\theta_{h,t}$ follows the autoregressive process:

$$\theta_{h,t} = \rho_h \, \theta_{h,t-1} + \xi_{h,t},$$

where $\xi_{h,t} \sim \mathcal{N}(0, \sigma^2_{\xi,h})$ is the persistent shock to income in period t. The Gaussian innovations

[14] Consider for instance a household that goes abroad for a few years, resulting in missing data. We eliminate all the years prior to the missing period. We also exclude the first remaining observation, so that the estimation is not contaminated by an abnormally low income for the year the household returns to Sweden.

$\varepsilon_{h,t}$ and $\xi_{h,t}$ are white noise and are uncorrelated with each other at all leads and lags. In practice, we allow $\sigma^2_{\varepsilon,h}$ and $\sigma^2_{\xi,h}$ to switch to new constant values when the household retires, but we suppress the time dependency of the variances for notational simplicity.

We conduct the estimation separately on bins defined by (i) the immigration dummy, (ii) the gender dummy, and (iii) educational attainment. Five levels of educational attainment are considered: a) incomplete high school education, b) high school diploma, c) incomplete three-year (general or vocational) university program, d) undergraduate degree, and e) postgraduate education, so that there are overall $2 \times 2 \times 5 = 20$ household bins. We estimate the fixed-effects estimators of a_h and b in each bin. For each household, we then compute the maximum likelihood estimators of ρ_h, $\sigma^2_{\varepsilon,h}$, and $\sigma^2_{\xi,h}$ using the household's income residual series. If the household is retired, we conduct the estimation on retirement income if at least 5 years of retirement income data are available; otherwise we drop the household to avoid estimation problems.

In the portfolio choice literature (e.g., Cocco, Gomes, and Maenhout (2005)), it is customary to assume that the household observes the transitory and persistent components of income. Since the characteristics $x_{h,t}$ are deterministic, log labor income $\log(L_{h,t})$ then has stochastic component

$$\eta_{h,t} = \xi_{h,t} + \varepsilon_{h,t}, \tag{IA-2}$$

and conditional variance

$$\sigma^2_h = \mathrm{Var}_{t-1}\left[\log(L_{h,t})\right] = \sigma^2_{\xi,h} + \sigma^2_{\varepsilon,h}.$$

We call σ_h the *conditional volatility of income* and use it as a measure of income risk throughout the main text. In this Internet Appendix, we also report the effects of the persistent and transitory volatilities $\sigma_{\xi,h}$ and $\sigma_{\varepsilon,h}$.

II.G Human Capital

We define expected human capital as

$$HC_{h,t} = \sum_{n=1}^{T_h} \Pi_{h,t,t+n} \frac{\mathbb{E}_t(L_{h,t+n})}{(1+r)^n}, \tag{IA-3}$$

where T_h denotes the difference between 100 and the age of household h at date t, and $\Pi_{h,t,t+n}$ denotes the probability that the household head h is alive at $t+n$ conditional on being alive at t. We make the simplifying assumption that no individual lives longer than 100. The survival probability is estimated using the life tables for men and women provided by Statistics Sweden. The discount rate is set equal to $r = 5\%$ per year.

For every household h, we compute the expected income $\mathbb{E}_t(L_{h,t+n})$ from our estimates of equation (IA-1). Consider a retired household. Since

$$\mathbb{E}_t(L_{h,t+n}) = \exp(a_h + b'x_{h,t+n})\, \mathbb{E}_t[\exp(\theta_{h,t+n} + \varepsilon_{h,t+n})],$$

we infer that

$$\mathbb{E}_t(L_{h,t+n}) = \exp\left[a_h + b'x_{h,t+n} + (\rho_h)^n \theta_{h,t} + \frac{1}{2}\sigma^2_{\varepsilon,h} + \frac{1}{2} Var_t(\theta_{h,t+n})\right],$$

where

$$Var_t(\theta_{h,t+n}) = \sigma^2_{\xi,h} \sum_{j=0}^{n-1} (\rho_h)^{2j}.$$

If the household is not retired, we use estimated income parameters to compute human capital before retirement, and imputed parameters[15] to compute human capital over the retirement period. We winsorize human capital at 50 million Swedish kronor (approximately $6 million).

[15] If there are less than 5 years of retirement observations, the standard deviations $\sigma_{\varepsilon,h}$ and $\sigma_{\xi,h}$ are set equal to 80% of their pre-retirement values, which captures the typical reduction in real income risk at retirement.

II.H Industry Sectors

Our definition of industry sectors is based on the SNI classification, the Swedish equivalent of the North American Standard Industrial Classification (SIC). The SNI codes are provided at the 5-digit level. The Swedish household panel uses the 1991 SNI classification for the 1999 to 2001 period, the 2002 SNI classification for the 2002 to 2006 period, and the 2007 SNI classification for 2007. For the years 1999, 2000, 2001, and 2007, we convert the industry codes in the panel into 2002 SNI codes by using the transition tables from the Statistics Sweden website. We also create an additional code for households whose industry code is missing.

In the baseline regression, the industry fixed effect is the 2-digit SNI code of the household head. We employ the 1-digit code of each adult household member to determine if a stock is professionally close.

II.I Market Shares of Growth and Value Stocks Held by Households

For a majority of Swedish firms, a substantial fraction of traded equity is held by the Swedish household sector, as Figure 1 and Section 2.4 of the main text show. We now assess if there exist ownership differences between growth and value firms. In Figure IA.1, we double-sort Swedish firms by market capitalization and value factor exposure, and then illustrate for each size-loading bucket the fraction of equity directly held by households. The figure reveals that household shares of growth, neutral and value firms are approximately the same within each size bucket.

II.J Cross-Sectional Distribution of Household Tilts

Section 2.5 of the main text documents that the value loading exhibits substantial heterogeneity across households. We now verify that these results are also evident in key investor subgroups. In Table IA.7, we report the distribution of the value loading for direct stockholders sorted by the number of firms that they own. The dispersion is high in all subgroups. Even among households owning directly more than five stocks, the difference between the 10th and 90th percentiles of the risky portfolio loading is approximately equal to unity, implying an expected return differential of the same size as the value premium.

The cross-sectional dispersion of the value loading is highly significant. In Table IA.8, we report the standard errors of the loadings reported in Table II of the main text and Table IA.7 of this Internet Appendix. We observe that the standard errors are all an order of magnitude smaller than the value loadings themselves. Thus, the dispersion of the value loading across households has high statistical significance.

III Life-Cycle Variation in the Value Tilt (Appendix to Section 3)

III.A Alternative Definitions of the Value Ladder

In Section 3.1 of the main text, we document life-cycle variation in the value loading of the risky and stock portfolios held by households. The value ladders plotted in Figure 2 are based on wealth-weighted age groups. In Figure IA.2 of this Internet Appendix, we illustrate the value ladders based on equally-weighted age groups (solid lines). We also plot the predicted equally-weighted loadings based on age, financial characteristics, and human capital (dotted lines), as is further explained in Section *III.E*. The charts look relatively similar to Figure 2.

III.B Age, Cohort, and Time Effects

This Section discusses how the value ladder presented in Section 3.1 relates to age, cohort, and time effects. In order to aid the analysis, we consider specifications of household portfolio value loadings of the form:

$$v_{h,t} = \Phi(t, B_h, A_{h,t}) + \lambda' x_{h,t} + \varepsilon_{h,t}, \tag{IA-4}$$

where t denotes the year of observation, B_h is the birth year of household h, $A_{h,t}$ is the age of household h in year t, $x_{h,t} \in \mathbb{R}^p$ is a vector of characteristics, $\varepsilon_{h,t}$ is a measurement error, and

$\Phi(\cdot)$ is a deterministic function of year, birthyear, and age. We do not specify the functional form of $\Phi(\cdot)$ for now, but at the end of the Section we discuss in greater detail the linear and dummy variable specifications.

Since age can be obtained by subtracting the birth year from the observation year:

$$A_{h,t} = t - B_h, \tag{IA-5}$$

the model (IA-4) is not identified, as Ameriks and Zeldes (2004) emphasize. We can therefore drop one of the variables, for instance age, from the set of explanatory variables in order to obtain better identification. That is, we let $\varphi(t, B_h) \equiv \Phi(t, B_h, t - B_h)$ and write the dependent variable as

$$v_{h,t} = \varphi(t, B_h) + \lambda' x_{h,t} + \varepsilon_{h,t}. \tag{IA-6}$$

We can similarly remove the observation year or the birth year to obtain better identified structures.

We now consider the implication of additional restrictions, which appear to hold in our household panel of value loadings (see Figure 2 and Table VI in the main text).

Restriction R1. *For every time lag Δt, the conditional expectation of the left-hand side variable is the same for (i) a household born in year $B_h - \Delta t$ observed in year $t - \Delta t$, and (ii) a household born in year B_h observed in year t.*

Restriction R2. *In every cohort, the average vector of characteristics varies linearly in age.*

We can then write

$$\varphi(t - \Delta t, B_h - \Delta t) = \varphi(t, B_h) \tag{IA-7}$$

for every admissible set of values. We infer that there exists a unique function ψ such that

$$\varphi(t, B_h) = \psi(t - B_h)$$

for all t and B_h. By (IA-5), the value loading is then a function of age and characteristics: $v_{h,t} = \psi(A_{h,t}) + \lambda' x_{h,t} + \varepsilon_{h,t}$.

Linear Case. We assume that the original model (IA-4) is defined by the linear function:

$$\Phi(t, B_h, A_{h,t}) = \alpha + \beta t + \gamma B_h + \delta A_{h,t}. \quad \text{(IA-8)}$$

Restriction R1 implies that

$$\gamma = -\beta, \quad \text{(IA-9)}$$

so that household loadings satisfy

$$v_{h,t} = \alpha + (\beta + \delta) A_{h,t} + \lambda' x_{h,t} + \varepsilon_{h,t}.$$

In the linear case, the value ladder can only be observed if $\gamma = -\beta$, that is if cohort effects and time effects offset each other in exactly the right way. This is extremely unlikely in a general model. Or, perhaps more plausibly, the value loading is driven by age, $A_{h,t}$, and the vector of characteristics, $x_{h,t}$, but not by cohort and time fixed effects.

Put slightly differently, one can entertain three alternative views. First, consistent with the earlier literature, one may consider general time, cohort, and age effects, under which the vector $(\beta, \gamma, \delta, \lambda)$ can take any value in $\mathbb{R}^{p+3}$. The value ladder only arises on a subset of measure zero of the parameter space, defined by (IA-9). Thus, the general model is unlikely to generate the value ladder. Second, one may consider that time and cohort effects both drive value loadings, but time and cohorts must offset each other exactly, as specified by (IA-9). While this second model generates the value ladder, it is challenging to find an economic justification for it. Third, one can consider that the value loading is driven only by age and the vector of characteristics, in which case the value ladder arise with probability one. This third view is consistent with the portfolio-choice literature on investment horizon effects (Lynch 2001, Jurek and Viceira 2011) and seems the most plausible to us.[16]

[16] As Section 3.4 of the main text explains, the value ladder is based on the *demeaned* loadings of participating households.

Specification with Dummy Variables. We now consider the model with time and cohort dummy variables:

$$v_{h,t} = \alpha_t + \gamma_{B_h} + \delta A_{h,t} + \lambda' x_{h,t} + \varepsilon_{h,t}.$$

Restrictions R1 and R2 imply that $\alpha_{t-\Delta t} + \gamma_{B_h - \Delta t} = \alpha_t + \gamma_{B_h}$. We infer that the sum $\alpha_t + \gamma_{B_h}$ depends only on $t - B_h$, which in turn implies that the time and cohort effects are affine functions with opposite slopes:

$$\alpha_t = \alpha_0 + \beta t, \tag{IA-10}$$

$$\gamma_{B_h} = \gamma_0 - \beta B_h. \tag{IA-11}$$

We are back to the linear case and conclude that the most plausible interpretation of Restrictions R1 and R2 is that the value loading is driven by age and the vector of characteristics, but not by time and cohort effects.

Link with Macroeconomic Experience. Malmendier and Nagel (2011) develop a model of risk-taking in which (i) a cohort's fixed effect is the weighted average return on an asset class (equity or bonds) during the cohort's lifespan, and (ii) time and age effects are well identified and can be flexibly estimated. The discussion in this section shows that a similar approach would not explain the value ladder. Indeed if cohort fixed effects were driven by market returns over time different periods, then cohort fixed effects would not be deterministic linear functions of cohort birth years, conditions (IA-10) and (IA-11) would not hold, and the value ladder would not be observed. This analysis suggests that the value ladder is more likely due to age effects than to macroeconomic experience.

We demean the data in order to adjust for turnover in the stock universe and the corresponding time variation in the loading of aggregate equity, which simultaneously affect all investors. We emphasize that our demeaning procedure consists of subtracting the average loading of *all* households in year t (including new participants). By contrast, a demeaning procedure based on the average loading of *maintained participants* might generate inconsistent results, as the linear model illustrates. Indeed, under this alternative scheme, equation (IA-8) would imply that a household's demeaned loading depends on the birth year but is independent of age, so that a linear value ladder would not arise. A proper demeaning procedure should therefore include households other than maintained participants, consistent with our discussions on intergenerational effects and the economic importance of entry and exit.

III.C Full Version of Table V

In Table V, Panel A, and Section 3.2 in the main text, we regress the financial portfolio's value loading on the leverage ratio, log residential real estate, log commercial real estate, the leverage ratio interacted with log residential real estate, the leverage ratio interacted with log commercial real estate, and the other baseline characteristics. Each interaction term is the product of demeaned leverage with demeaned real estate holdings, where demeaning is conducted year by year. Due to space constraints, we only report a limited set of coefficients in the main text. Table IA.9 of this Internet Appendix reports the full regression results.

Similarly, Table V, Panel B, of the main text partially reports regressions of the value loading on a dummy variable for having children and dummy variable for having twins, along with all the baseline characteristics. The estimation is conducted on a sample that includes all newborn twins. The full regression results are reported in Table IA.10 of this Internet Appendix.

III.D Decomposition of the Value Ladder and Economic Significance

In Table VI and Section 3.3 of the main text, we assess how of age and financial characteristics contribute to the value ladder. We consider a 30-year old, a 50-year old, and a 70-year old investor to which we assign the average wealth-weighted (VW) characteristics of their age group in 2003. The characteristics are reported in Table IA.11. When a characteristic is used in logarithmic form in the baseline regression, we first compute the VW average of the log characteristic and then take the exponential to facilitate the interpretation of the results.[17]

We obtain similar results when we consider equally-weighted (EW) averages instead of VW averages. Specifically, Table IA.12 reports EW averages for all three age groups and Table IA.13 imputes the resulting life-cycle migration predicted by the baseline coefficients in Table III. Similar to the results in Table VI, we see that (i) age and financial characteristics continue to explain the value ladder, (ii) the respective contribution of age remains about 60%, and (iii) the

[17]By Jensen's inequality, the averages of highly heterogeneous quantities, such as residential and commercial real estate holdings, take smaller values in Table IA.11 than in Table I.

migration remains linear in age.

In Table IA.14, we re-estimate the decomposition when the interaction between real estate and leverage is taken into account. This decomposition is based on the regression results of Table IA.9. Consistent with intuition, the combination of higher real estate wealth with lower leverage generates a substantial increase in the value tilt over the life-cycle. For example, if we consider the migration of the loading in the risky portfolio between ages 30 and 50, the combined effect of real estate and leverage in Table IA.14 explains about 9% of the observed change in the tilt. By contrast, in Table VI (which ignores the interaction), the combined effect of real estate and leverage only explains 2% of the observed change in the tilt.

III.E Predicted Value Ladder

In Section 3.3 of the main text, we show that age and financial characteristics largely explain the empirical variation in the value loadings of cohorts, as the predicted and empirical ladders in Figure 2 illustrate. In this Section, we explain the construction of the predicted value ladder, verify that our results are robust to including all observable characteristics, and provide goodness-of-fit statistics.

The predicted cohort loadings are based on the baseline regression coefficients reported in Table III of the main text, which are computed at the household level. The construction of the cohort loadings makes them directly comparable to the empirical loadings in Figure 2 of the main text, as we now explain. That is, we compute a cohort's characteristic in year t as the wealth-weighted average of all households in the cohort, and we then demean it to control for changes in the composition of the Swedish stock market. A cohort's predicted value loading each year corresponds to the product of the cohort's characteristics and the selected coefficients from Table III of the main text, in addition to the regression intercept. The predicted values in the main specification only consider the variables related to the household economic circumstances that vary over the life cycle, i.e., age, human capital, income, financial wealth, commercial and residential real estate wealth, and leverage.

In Figure IA.3, we plot an alternative specification of the predicted ladder, which is based on *all* the regression coefficients in Table III of the main text. The predicted ladder looks very similar to its equivalent in Figure 2 of the main text.

In Table IA.15, we report the explanatory power of the predicted ladder. For each cohort, we regress the observed average loading on the predicted loading on over the 1999 to 2007 sample period, and tabulate the corresponding R^2 coefficient.[18] The last column reports the average R^2 across cohorts. Panel A considers the main specification (Figure 2 of the main text). Panel B considers the alternate specification (Figure IA.3). The adjusted R^2 coefficients are substantial. They are highest in Panel A, which only considers characteristics as age, human capital, and other financial variables.

III.F Portfolio Tilts of New Participants

As Section 3.4 explains, one would like to check that the value ladder is not the mechanical consequence of exogenous drifts to which stockmarket participants are passively exposed. A natural identification strategy is to consider new participants in the year they enter risky asset markets. In Table IA.16, we regress the value loading of new participants on their characteristics. The results are consistent with the baseline regression.

IV Systematic Labor Income Risk and the Value Tilt (Appendix to Section 4)

IV.A Definition of Household Income Sensitivity to the Macro Factor

We define the income exposure to systematic factors at the industry level as follows. For each of the 70 two-digit sectors, let $L_{s,t} = \sum_{i=1}^{N_{s,t}} L_{i,t}/N_{s,t}$ denote per capita income, where $N_{s,t}$ is the

[18]We do not report the R^2 coefficient for households with a head between 70 and 74 in 1999 because the data become sparse in later years of the sample.

number of individual workers in sector s in year t and $L_{i,t}$ represent individual non-financial disposable income (as defined in Section *II.F* of this Internet Appendix). In order to obtain accurate estimates, we compute $L_{s,t}$ using all the workers in the sector, regardless of whether or not these workers are included in the random panel defined in Section *II.D* of this Internet Appendix. The annual growth rate of per capita income in the sector is then

$$\ell_{s,t} = \log(L_{s,t}) - \log(L_{s,t-1}). \tag{IA-12}$$

We naturally exclude from these calculations workers for whom industry sector data is missing, which removes about 3% of observations. We similarly define the growth rate of per-capita nonfinancial income in the economy, which we denote by $\overline{\ell_t}$.

For each sector, we estimate the sensitivity of sectoral income growth, $\ell_{s,t}$, to aggregate income by running the regression: $\ell_{s,t} = \alpha_s + \varphi_s \overline{\ell_t} + \varepsilon_{s,t}$.

Finally, we map back the estimates of sector-income betas to each household based on the sector the working adults work in. If the household includes two working individuals, we estimate the household sensitivity to the factor by

$$\varphi_{h,t} = \omega_{h,1,t}\, \varphi_{h,1,t} + \omega_{h,2,t}\, \varphi_{h,2,t} \tag{IA-13}$$

where $\varphi_{h,1,t}$ and $\varphi_{h,2,t}$ denote the sensitivities of the sectors in which household members 1 and 2 are employed, and $\omega_{h,1,t} = L_{h,1,t}/(L_{h,1,t} + L_{h,2,t})$ and $\omega_{h,2,t} = 1 - \omega_{h,1,t}$ are the shares of household income earned by household members 1 and 2 at time t. The motivation for this definition is the following. When individual growth rates are small, household income grows approximately at the rate

$$\log \frac{L_{h,1,t+1} + L_{h,2,t+1}}{L_{h,1,t} + L_{h,2,t}} \approx \omega_{h,1,t} \log \frac{L_{h,1,t+1}}{L_{h,1,t}} + \omega_{h,2,t} \log \frac{L_{h,2,t+1}}{L_{h,2,t}}, \tag{IA-14}$$

so that (IA-13) holds.

IV.B A Unified Factor Structure

In this Section, we develop a factor model of individual income under which the procedures discussed in Section *IV.A* consistently estimate the sensitivity of household income to the macro factor. We assume that *individual* labor income satisfies the usual specification

$$\log(L_{i,t}) = a_i + b' x_{i,t} + \theta_{i,t} + \varepsilon_{i,t},$$

where the persistent component satisfies the first-order autoregression

$$\theta_{i,t} = \rho_i \theta_{i,t-1} + \xi_{i,t}.$$

The innovation at date t of individual labor income growth is therefore

$$\eta_{i,t} = \xi_{i,t} + \varepsilon_{i,t}.$$

We assume that for every individual i working in sector s, the individual labor income innovation is the sum of a sectoral component and an idiosyncratic component:

$$\eta_{i,t} = \eta^*_{s,t} + u_{i,t},$$

where $u_{i,t}$ is uncorrelated to $\eta^*_{s,t}$. Under this restriction, the income of all workers in the sector has the same exposure to the sectoral factor, with a loading equal to unity. The restriction is for instance satisfied if the persistent and transitory components of income satisfy $\xi_{i,t} = \xi^*_{s,t} + v_{i,t}$ and $\varepsilon_{i,t} = \varepsilon^*_{s,t} + w_{i,t}$, where the random variables $\xi^*_{s,t}$, $v_{i,t}$, $\varepsilon^*_{s,t}$, and $w_{i,t}$ are mutually uncorrelated Gaussians.[19]

Under this structure, the exposure of *individual* income growth to various factors can be measured by estimating the exposure of the *sectors* to the factors. The aggregation procedure at the household level, given by (IA-13), is also sensible in this framework.

[19] Campbell, Cocco, Gomes, and Maenhout (2001) develop a theoretical model with a similar structure in which they assume a common economy-wide permanent component: $\xi^*_{s,t} = \xi^*_t$, and no common transitory component: $\varepsilon^*_{s,t} = 0$ in household income.

We can verify the validity of this factor structure by testing if individual loadings are equal to unity. Specifically, we estimate the sector-level income innovation:

$$\eta_{s,t} = \frac{1}{N_{s,t}} \sum_{i}^{N_{s,t}} \eta_{i,t}. \tag{IA-15}$$

on our core sample of individuals. For every worker, we then regress the individual income innovation on the sector innovation by running the regression:

$$\eta_{i,t} = \phi_i \eta_{s,t} + u_{i,t},$$

where s is the employment sector of worker i. Let π_0 denote the proportion of individuals who satisfy the null hypothesis

$$\mathbf{H_0}: \ \phi_i = 1.$$

We estimate π_0 by adopting the False Discovery Rate (FDR) method of Benjamini and Hochberg (1995), which incorporates the expected proportion of incorrect rejections ("false discoveries") that naturally occur in the context of multiple testing. As in Storey (2002) and Barras, Scaillet, and Wermers (2010), we estimate π_0 from the distribution of p-values by computing

$$\hat{\pi}_0 = \frac{N(\lambda^*)}{N} \frac{1}{1-\lambda^*}$$

where λ^* is a given threshold, $N = 270,201$ is the population of individuals in our core sample, and $N(\lambda^*)$ is the number of individuals with a p-value exceeding the threshold. With a threshold λ^* of 0.6, we obtain a proportion π_0 of 79.84%. Consistent with theory and earlier applications in different contexts (e.g., Barras Scaillet and Wermers 2010), the estimate of π_0 is almost insensitive to the choice of the threshold λ^* and remains contained between 78% and 82% as the threshold varies between 0.4 and 0.9. Therefore, the vast majority of workers have a loading ϕ_i that does not statistically differ from unity, which validates the approach followed in Section *IV.A*.

IV.C Full Version of Table VIII

In Table VIII, Panel B, and Section 4.2 in the main text, we regress the value tilt on the systematic component of sector-level income shocks, along with all the other baseline characteristics. The component is computed by following the methodology described in Section *IV.A* of this Internet Appendix. We report the full regression results in Table IA.17.

IV.D Systematic and Idiosyncratic Income Risk

This section investigates the respective roles of the idiosyncratic and systematic components of household income risk. In Table IA.18, we provide summary statistics on the total standard deviation and idiosyncratic share of the stochastic component of income, $\eta_{h,t}$. Specifically, we regress the stochastic component on the pricing factors: $\eta_{h,t} = \lambda'_{\eta,h} f_t + \omega_{h,t}$, and report the idiosyncratic share $Var(\omega_{h,t})/Var(\eta_{h,t})$. The idiosyncratic share is high and close to 80%, regardless of whether or not the household is retired. We obtain similar results when we decompose the persistent and transitory components of $\eta_{h,t}$.

In Table VIII and Section 4.2 in the main text, we show that high exposure to aggregate income shocks induces a growth tilt. One potential concern is that our measure of income volatility at the household-level already picks up systematic exposure. As Table IA.18 shows, the bulk of these income shocks are idiosyncratic, so that the collinearity between systematic risk and volatility is unlikely to be a concern. In Table IA.19, we confirm this intuition by regressing the value tilt on idiosyncratic household income volatility instead. The results are nearly identical to Table VIII in the main text.

IV.E Alternative Definitions of Industry Risk Exposures

We have henceforth estimated systematic risk exposures from the time series of per-capita industry income growth rates. We observe that these growth rates contain both predictable and unpredictable components, while only the unpredictable component might matter to an agent. We now provide an alternative specification that controls for expected income growth. Specifically, we consider the sectoral shocks $\eta_{s,t}$, defined in equation (IA-15), and map back the estimates of sectoral income exposures to each household as in Section *IV.A*. Table IA.20 reports the results of the regression with these new alternative measures of sector-level income exposures. The baseline results remain valid under this alternative definition.

As Liew and Vassalou (2000) and Table IA.4 show, the HML factor is a leading indicator of future economic growth. This result motivates us to use the exposure of income to lagged HML as measure of systematic risk, which we obtain by running the regression

$$\ell_{s,t} = a_s + b_s HML_{t-1} + \varepsilon_{s,t}. \tag{IA-16}$$

Similar to equation (IA-13), we then define the value loading of household h as the weighted average loading of the sectors in which household members are working: $b_{h,t} = \omega_{h,1,t}\, b_{h,1,t} + \omega_{h,2,t}\, b_{h,2,t}$.[20] Table IA.21 reports how the value loading of sectoral income, $b_{h,t}$, affects portfolio value loadings. The impact is strongly negative for the risky and fund portfolios. Thus, the results of Table IA.17 are robust to alternative definitions of industry risk exposures.

IV.F Value Loadings of Households Sorted by Age and Industry

In Table IX and Section 4.3 of the main text, we report the average value loadings of the *risky* portfolios held by households sorted by age and industry sensitivity. Table IA.22, Panel A, reports similar results for *stock* portfolios. Consistent with the main text, the value loading of the stock portfolio increases across age groups and decreases with industry sensitivity, the loading spread across industry sensitivity groups tends to decline with age, and the value ladder is steeper in more cyclical industries, just as the hedging motive implies.

In Table IA.22, Panel B, we report the results of a reverse sort. That is, we sort households by the value loading of the risky or stock portfolio and report the average labor income sensitivity in

[20] Note that we could also consider specifications with the four pricing factors. Since income growth is strongly correlated across sectors, however, the loadings of sectoral income growth on the four factors are highly collinear and we therefore focus on the univariate specification (IA-16).

each portfolio bucket. The industry sensitivity is lower among households with higher portfolio value tilts, as one expect from our earlier results.

Tables IX and IA.22 both consider *equal-weighted* averages. In Table IA.23, we consider instead *value-weighted* average loadings for the risky portfolio (Panel A) and the stock portfolio (Panel B). The table confirms all our previous results. Thus, the relationship between the value loading and industry sensitivity holds for both stock and risky portfolios and is also robust to various weighting schemes.

IV.G Value Ladder Across Industries

Figure 3 of Section 4.3 in the main text shows how the value ladder of the *risky* portfolio varies across industries. In Figure IA.4, we similarly illustrate how the value ladder of the *stock* portfolio varies across industries. Consistent with the results in the main text, the ladder of the stock portfolio is steeper in more cyclical industries. Furthermore, the ladders of less cyclical and more cyclical industries join for older households, as the hedging motive implies.

V Relation to Risk-Based Theories (Appendix to Section 5)

V.A Background Risk

In Section 5.2 of the main text, we show that the baseline results on family size, income risk, self-employment, and immigration status all give empirical support to the link between effective risk tolerance, background risk, and the value loading. We now provide additional evidence.

Income Volatility. The level of income risk in Sweden is substantial despite the important social welfare system. Table I of the main text reports that the average volatility of household real disposable income is 16% per year. Floden and Lindé (2001) and Betermier, Jansson, Parlour, and Walden (2012) also document high levels of income volatility in Sweden.[21] Section *IV.D*

[21] Complementary evidence from Holmlund and Storrie (2002) shows a sharp rise in fixed-term contracts following the recession of the early 1990's, accounting for up to 70% of new hires in Sweden by the late 1990's.

and Table IA.18 show that the bulk of income shocks are idiosyncratic and Table IA.19 verifies that idiosyncratic income volatility induces a growth tilt.[22]

Immigration and Self-Employment Status. Immigrants and entrepreneurs exhibit a growth tilt, presumably because of substantial idiosyncratic risk in employment and business assets. For instance, Lemaître (2007) provides a detailed description of the hurdles faced by immigrants in the Swedish labor market. In Tables IA.24 and IA.25, we use our data set to provide additional evidence. We report summary statistics on the socioeconomic and portfolio characteristics of households with an immigrant head (first column) or a nonimmigrant head (second column), and households headed by an entrepreneur (third column) or an employee (fourth column).

Immigrants are on average less wealthy, face higher income risk, are more likely to be unemployed and are less educated than nonimmigrants. The rate of unemployment is 11% for immigrants, as compared 7% for non-immigrants, in 2003. Immigrants also select financial portfolios with lower risky shares and lower value loadings than other households, consistent with theory.

Like immigrants, self-employed households also face particularly high levels of income risk. The income volatility of self-employed households is estimated at 29% per year, as compared to 16% for the average household (Table IA.24). Private businesses are also characterized by high failure rates and high risk in capital returns, which are primarily idiosyncratic (Moskowitz and Vissing-Jørgensen 2002).

V.B Intergenerational Effects

In Section 5.3 of the main text, we argue that the value ladder has a natural interpretation in an overlapping generations equilibrium context. The evidence in Table IA.26 supports this inter-

[22] The Table includes both the idiosyncratic income volatility and the exposure to aggregate income risk in order to disentangle the background risk channel from the hedging channel. It could be that our measure of idiosyncratic income risk picks up undetected systematic risk. We do not rule out this channel. However, we note that our measure of aggregate income risk seems to pick up the bulk of systematic income shocks across sectors. Moreover, as we show in Section *IV.B*, there is relatively little within-sector heterogeneity in the exposure to the income risk of each sector.

pretation. We investigate how the portfolios of new investors and pre-existing participants are impacted by age.

Specifically, we regress the value loading on cumulative age dummies, cumulative age dummies for new entrants, and all characteristics other than age. The cumulative age dummies common to all participants are strictly positive and almost all significant. Moreover, the relationship between a participants age and its value loading is approximately linear, consistent with our baseline specification and the value ladder.

The dummy variable for new entrants aged 30 or more is significantly negative. The other age dummies of new entrants are insignificant. Since the age dummy coefficients are cumulative, these results imply that (i) all new entrants have a significant bias toward growth stocks and (ii) age does not impact the difference between the tilt of preexisting participants and the tilt of new entrants. Thus, the value ladder of new entrants is located below and is parallel to the value ladder of preexisting participants.

VI Relation to Sentiment-Based Theories (Appendix to Section 6)

VI.A Overconfidence

In Section 6 of the main text, we interpret the effects of gender, self-employment, and immigration status on the value loading as possible evidence of overconfidence by investors. We now investigate the extent to which overconfident investors drive our other results. In Table IA.27, we reestimate the baseline regression on the subsample of households with a male head. Similarly in Tables IA.28 and IA.29, we reestimate the regressions on households with, respectively, a self-employed or an immigrant head. The baseline results hold in all subsamples, which implies that the main relationships between the value tilt and household financial characteristics are unlikely to be driven by overconfidence alone.

One potential explanation for this result is that biases such as overconfidence have limited impact on the overall financial portfolio. For example, Calvet, Campbell, and Sodini (2007) document that immigrants bear more idiosyncratic risk in their financial portfolios. However, since immigrants have lower risky shares, the volatility of the financial wealth of these households does not substantially differ from the financial wealth volatility of other households. Table IA.25 correspondingly shows that the volatility of the risky portfolio is 24% for immigrants vs. 22% non-immigrants, while the volatility of the total portfolio is 9% for both household categories. Analogous results hold for entrepreneurs.

VII Identification and Robustness Checks (Appendix to Section 7)

VII.A Stock Characteristics

We now present the robustness checks with respect to stock characteristics discussed in Section 7.1 of the main text.

VII.A.1 Popular and Professionally Close Stocks

We verify that popular and professionally close stocks are unlikely to explain the relationships between the value tilt and financial characteristics. In the first two sets of columns of Table IA.30, we reestimate the baseline regression on (1) household portfolios of popular stocks and (2) household portfolios of non-popular stocks. For both portfolios, characteristics have the same impact as in the baseline regressions.[23] We next consider professionally close stocks, which represent 16% of household stock portfolios. In columns (3) and (4) of Table IA.30, we show that the baseline results are also valid in household portfolios of professionally close stocks and in household portfolios of other stocks.

In Table IA.31, we reestimate the baseline regression separately on seven subsamples. We consider the seventy 2-digit sectors defined by the Swedish classification. We sort the sectors

[23] One complementary result in Table IV is that the baseline results holds among the wealthy subgroup of investors holding at least 5 firms, who do not have a bias for popular stocks.

by the value loading of employees owning only one stock, and rerun the baseline regression on (1) the subsample of households in the top fifteen growth sectors and (2) the subsample of households in the top fifteen value sectors. We next sort the 2-digit sectors by the loading of income on HML (as defined in Section *IV.E*), and reestimate the baseline regression on (3) the subsample of households in the bottom fifteen sectors and (4) households in the top fifteen sectors. We also consider (5) the fifteen sectors with the smallest shares of professionally close stocks and (6) the fifteen sectors with the highest shares. Column (7) focuses on public sector employees. Quite strikingly, the results obtained from every subsample are consistent with the baseline results obtained from the full sample.

An interesting implication of Table IA.31 is that the age coefficient is positive in all investor groups. In particular, households working in value industries do *not* shift their portfolios toward growth over the life-cycle as their financial portfolios expand. Thus, the relationship between age and the value loading is unlikely to be driven by mean reversion, which confirms the interpretation of the value ladder developed the main text.

Table IA.32 focuses on households that own stock portfolios with either 0% or 100% in professionally close stocks, and Table IA.33 considers households with either 0% or 100% in popular firms. Our baseline results are valid in eleven out of the twelve groups.

The exception is the subsample of households with stock portfolios fully invested in popular firms, for which financial wealth is negatively related to the value tilt. This unusual result is likely due to a selection effect. Households fully invested in popular firms typically own 1 or 2 stocks, are less wealthy and have a smaller stock portfolio share than other households. As they become richer, these households usually invest in a larger number of firms and drop out of the 100% popular stock portfolio subsample. The remaining wealthy households have a preference for popular growth stocks such as Ericsson and Telia, thus driving the negative cross-sectional correlation between the value loading and financial wealth in the 100% popular subsample.

VII.A.2 Dividends

We verify that dividends do not drive our results by considering dividend-sorted portfolios, which we construct as follows. First, we compute the annual dividend yield of each stock as in Section *II.C* of this Internet Appendix. Second, we define for every household two portfolios of directly-held stocks: the portfolio of stocks with zero dividend yields ('no-dividend stocks') and the portfolio of stocks whose average yields are above 2% ('high-dividend stocks'). These portfolios represent, respectively, 50% and 30% of all firms traded on the Swedish stock exchanges. The portfolio of no-dividend stocks provides the cleanest control because all its stocks have exactly the same dividend yield.

In columns (1) and (2) of Table IA.34, we reestimate the baseline regression on the sub-portfolio of no-dividend stocks and on the sub-portfolio of high-dividend stocks. The baseline results hold in both portfolios and are therefore unlikely to be driven by dividend yields.

VII.A.3 Taxes

We investigate the potential impact of taxes by considering two identification methods. First, the wealth tax, which was levied on Swedish households until 2007, applied to stocks in the A list of the Stockholm Stock Exchange but not to the smaller stocks in the O list. The O list includes approximately 230 stocks and is updated each year. Columns (3) and (4) of Table IA.34 show that our main results hold for both A stocks and O stocks.

Second, until the end of 2004, Swedish households were levied inheritance and gift taxes at death. As with the wealth tax, O-listed stocks were tax-exempt (Du Rietz, Henrekson, and Waldenström 2015). In Table IA.35, we reestimate the baseline regression over the subperiod that follows the repeal of the inheritance tax (2005-2007). The results are nearly identical to the ones obtained for the entire sample period (1999-2007). These findings confirm that tax optimization strategies are unlikely to drive our baseline results.

VII.A.4 Firm Age

A possible interpretation of the value ladder is that young households invest in young firms and old households invest in old firms, without consideration of HML loadings. This mechanism is unlikely to explain our baseline results for two main reasons. First, since we use unconditional estimates of firm loadings, our results cannot be contaminated by exogenous changes in firm value tilts between 1999 and 2007. Consequently, the value ladder in Figure 2 of the main text shows that the shares of value stocks increase over time in household portfolios. Second, we consider all the firms traded on Nordic exchanges in 2007. We construct the "young" portfolio as the set of stocks that have been listed for less than 10 years, and the "old" portfolio as the set of firms that have listed for at least 20 years. The young and old portfolios respectively contain 50% and 30% of all stocks. In columns (5) and (6) of Table IA.34, we re-estimate the baseline regression on the young stock and old stock sub-portfolios. The baseline results hold for both types of stocks.

VII.B Investor Characteristics

We now present the robustness checks related to investor characteristics discussed in Section 7.2 of the main text.

VII.B.1 Experience and Sophistication

One may be concerned that the age variable simply proxies for financial market experience. Naive new investors might purchase overpriced growth stocks, learn that these stocks are bad deals, and then progressively migrate toward value stocks as time goes by.[24] In Table IA.36, we control for learning effects by considering a measure of experience, the number of years since entry. We focus on 2007 risky asset market participants and regress the 2007 value loading on

[24] The psychology literature documents that cognitive biases attenuate with experience in sufficiently regular environments (Hogarth 1987, Kahneman 2011, Oskamp 1965). Malmendier and Nagel (2011) provide some evidence that younger or less experienced investors are especially likely to extrapolate from recent financial data.

the experience measure, age, the value loading in the year of entry, and the other usual characteristics in 2007. The coefficient on the number of years since entry is significantly *negative* for all portfolios, which is inconsistent with the simple learning story. Thus, financial market experience, measured by the number of years in risky asset markets, induces a growth tilt and, more importantly, cannot explain away the positive link between age and the value tilt. In a recent study, Campbell, Ramadorai, and Ranish (2014) consider an Indian brokerage data set containing highly detailed information on individual trades, but no socioeconomic characteristics. They show that the returns experienced by a household drive its future portfolio style. Our results indicate that the number of years spent on financial markets cannot explain away the relationship between age and value investing.

Table IA.36 also sheds light on the dynamics of the portfolio tilt during the participation period. The value loading in the entry year has a positive and strongly significant impact on the value loading in 2007, as one might expect. Furthermore, the effects of other characteristics remain significant and are consistent with our earlier results when we control for the initial loading. This suggests that the value loading is not simply driven by the initial portfolio in the year of entry, but also depends on financial and demographic characteristics in the subsequent participation period.

The experience variable used in Table IA.36 is defined as the number of years when the household participates in risky asset markets, which may be highly correlated with age. In Table IA.37, we control for potential multicollinearity problems by removing age from the regression. The impact of the financial experience variable remains significantly negative.

The Swedish Income and Wealth Registry provides the participation status between 1999 and 2007. The experience variable used in Table IA.36 is therefore bounded by the length of the panel. We now distinguish between households participating throughout the panel (for which the entry year is unknown) and households entering after 1999 (for which the entry year is known). In columns (1) to (3) of Table IA.38, we regress the value loading on the number of participation years if entry occurs after 1999, the 1999 participation dummy, and the other characteristics. In columns (4) to (6) of Table IA.38, we focus on households that join the market after 1999. The negative relationships between experience and the value loading hold in all six regressions. In Table IA.39, we exclude the age variable from the six regressions and verify once again that our results are not contaminated by multicollinearity.

In Section 5.2 of the main text, we argue that financial wealth does not seem to act as a proxy for financial sophistication. In Tables IA.40 and IA.41, we re-run the baseline regression for specific groups of households sorted each year by their levels of past financial wealth or education. The results are similar across all groups. Thus our baseline results cannot be attributed to cross-sectional heterogeneity in financial sophistication and experience.

VII.B.2 Latent Heterogeneity

The baseline regressions include household characteristics and yearly, industry, and county fixed effects. We now use the twin panel to verify that the characteristics do not merely proxy for latent traits or family background. For example, since twins have similar expected inheritance, one may be concerned that differences in own financial wealth and human capital of each twin no longer explain their respective portfolio loadings. We show that this is not the case.

In Table IA.42, we estimate the specification:

$$v_{k,1,t} = \alpha_{k,t} + b' x_{k,1,t} + e_{k,1,t}, \quad \text{(IA-17)}$$

$$v_{k,2,t} = \alpha_{k,t} + b' x_{k,2,t} + e_{k,2,t}, \quad \text{(IA-18)}$$

where $v_{k,j,t}$ denote the value loading of sibling $j \in \{1,2\}$ in pair k at date t, $\alpha_{k,t}$ is a yearly pair fixed effect, $x_{k,j,t}$ denotes the vector of yearly characteristics of sibling j, and $e_{k,j,t}$ is an orthogonal error. The yearly twin pair fixed effect captures the impact of time, such as age or stock market performance, as well as similarities between the twins, such as common genetic makeup, family background, upbringing, and expected inheritance. Since twin siblings have the same age, the twin regression naturally controls for cohort effects.[25]

The coefficients of the twin regressions are consistent with the baseline results. The table also reveals that yearly twin pair fixed effects are quantitatively important. The *adjusted* R^2 reaches 13% for the risky portfolio and 23% for the stock portfolio, which substantially improves on the baseline 2% (risky portfolio) and 4% (stock portfolio) estimates reported in Table III. The *nonadjusted* R^2 coefficients in Table IA.42 are even higher and close to 60% for all portfolios. The difference between adjusted and nonadjusted R^2 is of course due to the large number of fixed effects in the twin specification (IA-17)–(IA-18).

We consider a more parsimonious model that only includes twin pair fixed effects, α_k^*, and year fixed effects, δ_t. That is, the new specification imposes the separability restriction

$$\alpha_{k,t} = \alpha_k^* + \delta_t.$$

The restricted model is specified by $K+T$ fixed effects, while the unrestricted twin regression is specified by $K \times T$ fixed effects. Table IA.43 reports the results of the restricted estimation. The coefficients are similar to the ones obtained in Table IA.42. The unadjusted R^2 coefficient is slightly lower than in the unrestricted case. Due to the smaller number of fixed effects, however, the adjusted R^2 is now about 40%, which substantially improves on the unrestricted twin regression.

In Table IA.44, we re-run the twin regression on the subsample of identical twins, who have the same genes. We use yearly twin-pair fixed effects in columns (1) to (3), and yearly fixed effects in columns (4) to (6). We lose some statistical significance in the first estimation, which is due to the smaller sample size and the higher correlation of characteristics between identical twins, but the regressions remain otherwise largely unchanged.

[25]Calvet and Sodini (2014) apply this methodology to the determinants of the risky share. Cesarini, Dawes, Johannesson, Lichtenstein, and Wallace (2009), Cesarini, Johannesson, Lichtenstein, Örjan Sandewall, and Wallace (2010), and Barnea, Cronqvist, and Siegel (2010) also use twins to investigate risk-taking.

VII.B.3 Communication and Genes

The choice of the value tilt might result from discussions with neighbors, colleagues, or relatives, irrespective of the households own financial situation (Hong, Kubik, and Stein 2004, Massa and Simonov 2011). The regressions with twin pair fixed effects control for unobserved sources of heterogeneity, but do not address the concern that socioeconomic characteristics no longer influence the tilt within the subset of twins who communicate frequently.

In Table IA.45, we classify a twin pair as "high communication" if the frequency of mediated communication and the frequency of unmediated communication are both above the median, and as "low communication" otherwise. We sort twin pairs into communication bins, and reestimate in each bin the baseline regression with year, industry and county fixed effects. The reported regressions are generally consistent with the baseline results. In Table IA.46, we obtain similar coefficients when we include yearly twin pair fixed effects. Thus, communication does not drive the relationship between the value tilt and socioeconomic variables.

The large R^2 of the twin regressions in Table IA.42 might suggest that value investing has genetic origins. Cronqvist, Siegel, and Yu (2015) consider a genetic model of the value loading, in which the value loading $v_{k,s}$ of sibling s in pair k is assumed to be the sum of a genetic component, $a_{k,s}$, a common component, c_k, and an idiosyncratic component, $\varepsilon_{k,s}$:

$$v_{k,s} = a_{k,s} + c_k + \varepsilon_{k,s}.$$

The main identification condition is that the twin correlation of the genetic component, $Corr(a_{k,1}; a_{k,2})$, is 1 for identical twins and $1/2$ for fraternal twins. Under this model, the contribution of the genetic component to the cross-sectional variance of the value loading satisfies

$$\frac{Var(a_{k,s})}{Var(v_{k,s})} = 2(\rho_I - \rho_F), \tag{IA-19}$$

where ρ_I denotes the twin correlation of the value loading among identical siblings, and ρ_F denotes the twin correlation among fraternal siblings. This equation serves as the basis for estimation. Cronqvist, Siegel, and Yu (2015) attribute 30% of the value loading to the genetic component.

Table IA.47 confirms these earlier results, but shows that they are highly sensitive to communication. The genetic share reaches 35% for frequent communicators but disappears almost entirely among infrequent communicators, with estimates that do not exceed 1% across specifications.[26] Thus, the model used by Cronqvist, Siegel, and Yu (2015) is severely misspecified because a truly genetic component should not depend on communication.

The sensitivity of the genetic decomposition is related to one of its well-known shortcomings, namely that it neglects interactions between genetic and environmental variables. Interactions between nature and nurture are known to be empirically important in medicine and experimental psychology (Ridley 2003). The modern view in these fields is that genes cause a predisposition to certain behaviors or diseases, which develop only in particular environments. Table IA.47 shows that the clean dichotomy between nature and nurture is equally elusive in the context of value investing.

VII.C Other Robustness Checks

We now present the miscellaneous robustness checks discussed in Section 7.3 of the main text.

VII.C.1 Assessing the Multicollinearity of Household Characteristics

One might be concerned that the baseline regression in Table III of the main text includes multicollinear or redundant explanatory variables. In Tables IA.48 to IA.50, we verify that multicollinearity is not a cause for concern by regressing the value loading on different combinations of the characteristics (financial, human capital, demographics). The estimates remain stable

[26] The estimator of the genetic share (IA-19) is the rescaled difference between two sample correlations. It can therefore take negative values if the estimate of ρ_I is lower than the estimate of ρ_F in a particular sample. In fact, under the null hypothesis

$$H_0: \rho_I = \rho_F,$$

the estimator of the genetic share converges asymptotically to a centered normal as the number of pairs goes to infinity. *Negative* estimates of the so-called genetic share are then asymptotically as likely as positive estimates.

across the different specifications for all three portfolios.

VII.C.2 Reverse Causality Between Financial Wealth and the Value Loading

In the main text, we have interpreted the positive relationship between financial and the value loading as evidence that financial wealth induces a value tilt in household portfolios. One may worry, however, about the reverse causality between financial wealth and the value tilt. Indeed, since there is a value premium, the financial wealth of value investors should grow more quickly on average than the wealth of growth investors, which could explain the positive cross-sectional relationship between the value loading and financial wealth.

In Table IA.51, we control for such effects by regressing the value loading on lagged financial wealth and other characteristics. The coefficient on lagged financial wealth is positive and strongly significant. In Table IA.52, we verify that our baseline results remain valid when we include both the lagged value loading and lagged financial wealth. Thus, reverse causality between financial wealth and the value tilt does not seem to be a source of concern.

VII.C.3 Persistent and Transitory Components of Income Risk

The baseline regressions in Table III of the main text indicate that the income of value investors has low conditional volatility. As Section *II.F* explains, our results are based on total conditional volatility, which is determined by both transitory and persistent shocks. We now verify that our baseline results are not solely driven by one type of shock. In Tables IA.53 and IA.54, we replace the total conditional volatility with, respectively, the persistent shock volatility and the transitory shock volatility. Both forms of volatility are associated with a growth tilt.

VII.C.4 Alternative Definitions of the Household Income Process

The labor income process is defined and estimated at the household level throughout the main text and this Internet Appendix. Since household composition changes over time, labor income series are sometimes substantially longer for individual household members than for the household unit itself. For this reason, we now consider an alternative specification based on individual series.

The household income process is constructed as follows. We assume that individual non-financial disposable income and human capital are specified as in Sections *II.F* and *II.G* of this Internet Appendix. The household's human capital is then defined as the sum of the human capital estimates of its members. If the household includes two working individuals with respective income volatilities σ_1 and σ_2, we define the household conditional income volatility as:

$$\sigma_{h,t} = \sqrt{\omega_{h,1,t}^2 \sigma_1^2 + \omega_{h,2,t}^2 \sigma_2^2}, \tag{IA-20}$$

where $\omega_{h,1,t} = L_{h,1,t}/(L_{h,1,t} + L_{h,2,t})$ and $\omega_{h,2,t} = 1 - \omega_{h,1,t}$ denote, respectively, the share of household income earned by household members 1 and 2 at time t. As the loglinear approximation of log household income growth (IA-14) implies, the volatility (IA-20) is a first-order approximation of the conditional standard deviation of log household income when individual incomes are uncorrelated and have low volatilities σ_1 and σ_2.

We estimate the alternative specification on a panel of households subject to the following data requirements. The income of every adult household member satisfies the basic conditions imposed on household income in Section *II.D* of this Internet Appendix. We also consider three additional filters to avoid estimation issues. First, we discard households that come out of retirement. Second, if an adult other than the head has fewer than 5 years of income data, we model only the human capital and income risk of the head. Third, we filter out a household if a retired member other than the head has less than 5 years of pre-retirement income data or less than 5 years of post-retirement data. These additional filters only impact a small group of households.

In Table IA.55, we regress the household value loading on these alternative measures of income risk and human capital as well as other characteristics. The results are consistent with the baseline regression in Table III of the main text. Thus, the main findings of the paper are the same regardless of whether the income process is defined at the household or at the individual level.

VII.C.5 Households vs. Individuals

The age, gender, education and immigration variables used throughout the main text and this Internet Appendix refer to the household head. In Table IA.56, we verify that the baseline results on the subsample of households headed by a single adult, which indicates that our findings do not depend on the definition of the household.

VII.C.6 Exposure to the Size Factor

Since the majority of growth stocks are also small stocks, one might worry that Table III of the main text is more informative about the size loading than about the value loading. We now investigate the joint implications of size and value for our core results. We note that the sample correlation between the HML and SMB Swedish factors is -0.037 over the 1985 to 2009 sample period, which suggests that size is unlikely to be a confounding factor. In Table IA.57, we verify this intuition by regressing the value loading on the baseline characteristics and the size loading of the risky portfolio as an additional control. The baseline results are unchanged when we control for size.

VII.C.7 Exposure to the Global Value Factor

All the results presented until now are based on Swedish asset pricing factors. One may ask if the baseline results also hold under a global asset pricing model. In Table IA.58, we reestimate the value loading of assets and investors using U.S. factors and verify that our baseline results are unchanged. Thus, the main conclusions of the paper remain the same whether the value factor has local or global origins, consistent with the global equilibrium model discussed in Section *VIII.E*.

VIII An Equilibrium Model of the Value Tilt

In this Section, we develop an equilibrium model of the value tilt based on Merton (1973)'s ICAPM. We summarize key features of the model in Section 5.4 of the main text.

VIII.A Setup

We consider an infinite-horizon continuous-time economy with multiple assets and state variables. As in Merton (1973), the economy is defined by

$$d\boldsymbol{y}_t = \boldsymbol{\mu_y}(\boldsymbol{y}_t)dt + \boldsymbol{\sigma_y}(\boldsymbol{y}_t)d\boldsymbol{z_t},$$
$$d\boldsymbol{R}_t = \boldsymbol{\mu}(\boldsymbol{y}_t)dt + \boldsymbol{\sigma}(\boldsymbol{y}_t)d\boldsymbol{z_t},$$

where:

- $\boldsymbol{y}_t$ is a K-dimensional vector of state variables;
- $d\boldsymbol{R}_t$ denotes the I-dimensional column vector of asset returns;
- $\boldsymbol{z}_t$ is an $(I+K)$-dimensional Brownian motion with zero drift and an instantaneous variance-covariance matrix equal to the identity matrix: $\mathbb{E}_t(d\boldsymbol{z_t}d\boldsymbol{z_t'}) = \boldsymbol{I}\,dt$;
- $\boldsymbol{\sigma_y}(\cdot)$ is a $K \times (I+K)$ matrix driven by the state vector;
- $\boldsymbol{\sigma}(\cdot)$ is an $I \times (I+K)$ matrix also driven by the state vector.

Agents can trade the risky assets $i \in \{1, \cdots, I\}$ and a riskless asset with instantaneous rate of return r, to which we refer as asset $i = 0$. The interest rate is assumed to be constant for expositional simplicity. As is standard in the ICAPM, the dynamics of $\boldsymbol{y_t}$ and $\boldsymbol{R_t}$ are exogenous to the model.[27]

We find it useful to introduce the following notation. Let $\boldsymbol{\mu_t} = \boldsymbol{\mu}(\boldsymbol{y}_t)$ denote the vector of expected returns on risky assets at t, and let $\boldsymbol{\Sigma}_t = \boldsymbol{\sigma}(\boldsymbol{y_t})\boldsymbol{\sigma}(\boldsymbol{y_t})'$ denote the instantaneous variance-

[27] See Cochrane (2007) for a detailed discussion of the ICAPM.

covariance matrix. The $I \times K$ matrix containing the multivariate-regression coefficients of the K state innovations on the I return innovations is

$$\boldsymbol{\beta}_t' = \boldsymbol{\Sigma}_t^{-1}\boldsymbol{\sigma}(\boldsymbol{y}_t)\boldsymbol{\sigma}_{\boldsymbol{y}}(\boldsymbol{y}_t)' = (\boldsymbol{\beta}_{1,t}', \cdots, \boldsymbol{\beta}_{K,t}'), \tag{IA-21}$$

where $\boldsymbol{\beta}_{k,t}'$ denotes the k^{th} column vector of $\boldsymbol{\beta}_t'$.

The tangency portfolio

$$\boldsymbol{\tau}_t = \frac{\boldsymbol{\Sigma}_t^{-1}(\boldsymbol{\mu}_t - r\mathbf{1})}{\mathbf{1}'\boldsymbol{\Sigma}_t^{-1}(\boldsymbol{\mu}_t - r\mathbf{1})} \tag{IA-22}$$

is the portfolio with the highest Sharpe ratio, as is familiar from the CAPM. The normalizing constant in (IA-22) is the performance measure:

$$\mathbf{1}'\boldsymbol{\Sigma}_t^{-1}(\boldsymbol{\mu}_t - r\mathbf{1}) = \frac{\mu_{\tau,t} - r}{\sigma_{\tau,t}^2}, \tag{IA-23}$$

where $\mu_{\tau,t} = \boldsymbol{\mu}_t'\boldsymbol{\tau}_t$ and $\sigma_{\tau,t}^2 = \boldsymbol{\tau}_t'\boldsymbol{\Sigma}_t\boldsymbol{\tau}_t$ denote, respectively, the drift and variance of the tangency portfolio.[28] The mimicking portfolio for state variable k,

$$\boldsymbol{x}_{k,t} = \frac{\boldsymbol{\beta}_{k,t}'}{\mathbf{1}'\boldsymbol{\beta}_{k,t}'}, \tag{IA-24}$$

provides the greatest absolute correlation with the k^{th} state variable, as is familiar in the ICAPM (see, e.g., Ingersoll (1987)).[29] Finally, for every $k \in \{1, \cdots, K\}$, we define $\boldsymbol{f}_{k,t}$ as the difference

[28]The result can be derived as follows. The tangency portfolio has excess drift

$$\mu_{\tau,t} - r = (\boldsymbol{\mu}_t - r\mathbf{1})'\boldsymbol{\tau}_t = \frac{(\boldsymbol{\mu}_t - r\mathbf{1})'\boldsymbol{\Sigma}_t^{-1}(\boldsymbol{\mu}_t - r\mathbf{1})}{\mathbf{1}'\boldsymbol{\Sigma}_t^{-1}(\boldsymbol{\mu}_t - r\mathbf{1})}.$$

The instantaneous variance of the tangency portfolio, $\sigma_{\tau,t}^2 = \boldsymbol{\tau}_t'\boldsymbol{\Sigma}_t\boldsymbol{\tau}_t$, therefore satisfies

$$\sigma_{\tau,t}^2 = \frac{(\boldsymbol{\mu}_t - r\mathbf{1})'\boldsymbol{\Sigma}_t^{-1}(\boldsymbol{\mu}_t - r\mathbf{1})}{[\mathbf{1}'\boldsymbol{\Sigma}_t^{-1}(\boldsymbol{\mu}_t - r\mathbf{1})]^2} = \frac{\mu_{\tau,t} - r}{\mathbf{1}'\boldsymbol{\Sigma}_t^{-1}(\boldsymbol{\mu}_t - r\mathbf{1})},$$

which implies that (IA-23) holds.

[29]That is,

$$\boldsymbol{x}_{k,t} = \arg\max_{\boldsymbol{w} \in \mathbb{R}^I} |Corr(\boldsymbol{w}'d\boldsymbol{R}_t; dy_{k,t})|$$

subject to $\mathbf{1}'\boldsymbol{w} = 1$. The sign of the correlation between the return on portfolio $x_{k,t}$ and state variable k is not known in general. The portfolio $\boldsymbol{x}_{k,t}$ is frequently referred to as the "hedge portfolio" for state variable k. As in Cochrane (2007), we use instead the term "mimicking portfolio" because hedging against adverse realizations of state variable k may involve either a long or a short position in the portfolio $\boldsymbol{x}_{k,t}$.

between the k^{th} mimicking portfolio and the tangency portfolio:

$$\boldsymbol{f_{k,t}} = \boldsymbol{x_{k,t}} - \boldsymbol{\tau_t}. \tag{IA-25}$$

The portfolios $\boldsymbol{f_{k,t}}$ are long-short portfolios whose shares add up to zero: $\mathbf{1}'\boldsymbol{f_{k,t}} = 0$. We find it convenient to arrange them into the $I \times K$ matrix $\boldsymbol{f_t} = [\boldsymbol{f_{1,t}}, \cdots, \boldsymbol{f_{K,t}}]$. As we will see in Section *VIII.C*, the long-short portfolios act as pricing factors and therefore play an important role in the cross-section of returns.

The continuous-time economy is populated at every instant t by a non-empty set of agents $\mathcal{H}_t$. Each agent receives a stochastic income flow L_t^h, which is a deterministic function of the state vector y_t. Stochastic labor income is not considered in Merton (1973)'s original formulation but is included in Breeden (1979)'s version of the ICAPM. We assume that agents have finite lives but impose no particular structure on their life spans, so the model can accommodate a wide range of overlapping generations models.

VIII.B Optimal Portfolio Selection

At every instant of his life, each agent h maximizes expected utility from consumption and final bequest,

$$\mathbb{E}_t \left\{ \int_t^{T_h} U^h(c_t^h, t)dt + B^h \left[W^h(T_h), T_h, y(T_h) \right] \right\},$$

where T_h is agent h's time of death, U^h is the utility of consumption, and B^h is the utility of terminal wealth.

The agent selects at every instant the optimal rate of consumption, c_t^h, the risky share, w_t^h, and the share of the risky portfolio invested in each risky asset, $\omega_{i,t}^h$, where $i = 1, \cdots, I$. We stack the shares into the I-dimensional column vector $\boldsymbol{\omega_t^h}$, which satisfies $\mathbf{1}'\boldsymbol{\omega_t^h} = 1$. Wealth evolves as:

$$dW_t^h = [W_t^h r + W_t^h (w_t^h \boldsymbol{\omega_t^h})'(\boldsymbol{\mu_t} - r\mathbf{1}) + L_t^h - c_t^h]dt + W_t^h\,(w_t^h \boldsymbol{\omega_t^h})'\boldsymbol{\sigma_t} d\boldsymbol{z}_t.$$

We denote by $J^h(W^h, \boldsymbol{y}, t)$ the indirect utility of wealth at date t.

As in Ingersoll (1987), we consider the *market-adjusted coefficient of risk tolerance*:

$$D_t^h = \frac{\mu_{\tau,t} - r}{\sigma_{\tau,t}^2} \frac{1}{\gamma_t^h}, \tag{IA-26}$$

where $\gamma_t^h = -W_t^h J_{WW}^h / J_W^h$ is the local curvature of the value function,

Proposition 1 (Optimal portfolio) *The optimal shares of risky assets in agent h's complete financial portfolio are given by*

$$w_t^h \boldsymbol{\omega_t^h} = D_t^h \boldsymbol{\tau_t} + \sum_{k=1}^K \eta_{k,t}^h \boldsymbol{x_{k,t}} = \underbrace{\left(D_t^h + \sum_{k=1}^K \eta_{k,t}^h \right)}_{w_t^h} \underbrace{\left(\boldsymbol{\tau_t} + \sum_{k=1}^K \frac{\eta_{k,t}^h}{w_t^h} \boldsymbol{f_{k,t}} \right)}_{\boldsymbol{\omega_t^h}}, \tag{IA-27}$$

where $\eta_{k,t}^h$ denotes the market-adjusted sensitivity to state k:

$$\eta_{k,t}^h = -\frac{J_{Wk}^h}{W_t^h J_{WW}^h} \mathbf{1}' \boldsymbol{\beta'_{k,t}}. \tag{IA-28}$$

Furthermore the optimal consumption plan $c^h(W, \boldsymbol{y}, t)$ satisfies the envelope conditions

$$J_{WW}^h = U_{cc}^h \frac{\partial c^h}{\partial W} \quad \textit{and} \quad J_{Wk}^h = U_{cc}^h \frac{\partial c^h}{\partial y_k} \tag{IA-29}$$

for every $k \in \{1, \ldots, K\}$.

Proof. As Breeden (1979) shows, the Hamilton-Jacobi-Bellman equation implies that the vector of optimal weights satisfies

$$w_t^h \boldsymbol{\omega_t^h} = -\frac{J_W^h}{W_t^h J_{WW}^h} \boldsymbol{\Sigma_t^{-1}} (\boldsymbol{\mu_t} - r\mathbf{1}) - \boldsymbol{\beta'_t} \frac{\boldsymbol{J_{Wy}^h}}{W_t^h J_{WW}^h},$$

where $\boldsymbol{J_{Wy}^h}$ is the $K \times 1$ column-vector of the derivatives of the marginal utility of wealth with respect to the elements of state variable vector $\boldsymbol{y}$. We immediately infer from equations (IA-22), (IA-23), (IA-26) and (IA-28) that $w_t^h \boldsymbol{\omega_t^h} = D_t^h \boldsymbol{\tau_t} + \sum_{k=1}^K \eta_{k,t}^h \boldsymbol{x_{k,t}}$. Hence $w_{h,t} = D_t^h + \sum_{k=1}^K \eta_{k,t}^h$. We use (IA-25) to substitute out $\boldsymbol{x_{k,t}}$ and infer that (IA-27) holds. Finally, equation (IA-29) is a direct implication of the envelope theorem. ∎

The agent invests in the riskless asset, the tangency portfolio and the K mimicking portfolios. The coefficients D_t^h and $\eta_{k,t}^h$, $k = 1, \cdots, K$, represent the shares of financial wealth invested in each of the $K+1$ risky portfolios. Their sum is therefore the agent's risky share. We now discuss the magnitude of these coefficients.

The market-adjusted risk-tolerance coefficient, D_t^h, is the share of financial wealth invested in the tangency portfolio. By (IA-26), it takes a high value if the agent has high risk tolerance, or if the tangency portfolio has a high Sharpe ratio and low volatility.

The market-adjusted state sensitivities, $\eta_{k,t}^h$, coincide with the optimal shares of financial wealth invested in (or borrowed from) the mimicking portfolios $\boldsymbol{x_{k,t}}$. Their effect on the agent's risky share can be either positive or negative depending on how the state variables affect the agent's utility. For instance, assume that a high realization of the k^{th} state variable is good news:

$$\frac{\partial c^h}{\partial y_k} > 0 \quad \text{and} \quad J_{Wk}^h < 0, \tag{IA-30}$$

which will be the typical scenario throughout the Section. By (IA-28), the sign of the portfolio share $\eta_{k,t}^h$ is then driven by the sign of $\mathbf{1}'\boldsymbol{\beta}'_{\boldsymbol{k,t}}$, that is by the sign of the regression coefficients of factor k on the I assets. We consider two cases.

E1 Risky assets co-move positively with the state ($\mathbf{1}'\boldsymbol{\beta}'_{\boldsymbol{k,t}} > 0$). The state is for instance a measure of aggregate consumption or aggregate income, which co-varies positively with asset prices. It is then optimal for the agent to reduce his exposure to the k^{th} state by *shorting* the k^{th} mimicking portfolio $\boldsymbol{x_{k,t}}$, that is $\eta_{k,t}^h < 0$.

E2 Risky assets co-move negatively with the factor ($\mathbf{1}'\boldsymbol{\beta}'_{\boldsymbol{k,t}} < 0$). The state is for instance a discount rate or market price of risk, which co-varies negatively with asset prices. It is then optimal for the agent to reduce his exposure to the state by taking a *long* position in the k^{th} mimicking portfolio $\boldsymbol{x_{k,t}}$, that is $\eta_{k,t}^h > 0$.

We will consider both cases in the application to the value premium presented in Section *VIII.F*.

We now turn to the composition of the *risky* portfolio. By equation (IA-27), the risky portfolio is the sum of the tangency portfolio and a linear combination of the K long-short portfolios $\boldsymbol{f_{k,t}}$. This result is useful because it closely ties the ICAPM results to the empirical results in the main text. The agent's optimal loading on the k^{th} long-short portfolio,

$$\frac{\eta^h_{k,t}}{w^h_t} = \frac{\eta^h_{k,t}}{D^h_t + \sum_{k'=1}^{K} \eta^h_{k',t}},$$

is a function of the state-k sensitivity, $\eta^h_{k,t}$, relative to (i) the sensitivities to other states, $\eta^h_{k',t}$, $k' \neq k$, and (ii) the market-adjusted risk tolerance, D^h_t. Thus, for given risk sensitivities $\eta^h_{k,t}$, the composition of the risky portfolio is strongly impacted by the hedging motive if the risky portfolio represents a small fraction of household wealth, as is the case if the agent has high risk aversion (Ingersoll 1987). In the next section, we investigate the constraints that equilibrium imposes on investor portfolio tilts.

VIII.C Asset Pricing

We now derive the implications of market clearing for asset holdings and risk premia. We henceforth focus on risky portfolios, which is a slight departure from the literature. Let $\boldsymbol{m_t} \in \mathbb{R}^I$ denote the market portfolio of risky assets, which satisfies $\mathbf{1}'\boldsymbol{m_t} = 1$.

Proposition 2 (Market portfolio) *In equilibrium, the market portfolio satisfies*

$$\boldsymbol{m}_t = \boldsymbol{\tau_t} + \sum_{k=1}^{K} \frac{\eta^m_{k,t}}{w^m_t} \boldsymbol{f_{k,t}}, \qquad \text{(IA-31)}$$

where $\eta^m_{k,t}$ denotes the wealth-weighted average of investor tolerance to state variable k:

$$\eta^m_{k,t} = \frac{\sum_{h \in \mathcal{H}_t} W^h_t \eta^h_{k,t}}{\sum_{h \in \mathcal{H}_t} W^h_t}, \qquad \text{(IA-32)}$$

D^m_t is the wealth-weighted measure of risk tolerance:

$$D^m_t = \frac{\sum_{h \in \mathcal{H}_t} W^h_t D^h_t}{\sum_{h \in \mathcal{H}_t} W^h_t},$$

and w_t^m is the aggregate risky share:

$$w_t^m \equiv \frac{\sum_{h\in\mathcal{H}_t} W_t^h w_t^h}{\sum_{h\in\mathcal{H}_t} W_t^h} = D_t^m + \sum_{k=1}^{K} \eta_{k,t}^m.$$

Proof. In equilibrium, the market portfolio coincides with the wealth-weighted demand for risky assets:

$$\boldsymbol{m_t} = \frac{\sum_{h\in\mathcal{H}_t} w_t^h W_t^h \boldsymbol{\omega_t^h}}{\sum_{h\in\mathcal{H}_t} w_t^h W_t^h}. \tag{IA-33}$$

We note that

$$\sum_{h\in\mathcal{H}_t} w_t^h W_t^h \boldsymbol{\omega_t^h} = \sum_{h\in\mathcal{H}_t} w_t^h W_t^h \left(\boldsymbol{\tau_t} + \sum_{k=1}^{K} \frac{\eta_{k,t}^h}{w_t^h} \boldsymbol{f_{k,t}}\right) = \left(\sum_{h\in\mathcal{H}_t} w_t^h W_t^h\right)\boldsymbol{\tau_t} + \sum_{k=1}^{K}\left(\sum_{h\in\mathcal{H}_t} W_t^h \eta_{k,t}^h\right)\boldsymbol{f_{k,t}}.$$

Hence (IA-31) is satisfied. Since

$$w_t^m = \frac{\sum_{h\in\mathcal{H}_t} W_t^h \left(D_t^h + \sum_{k=1}^{K} \eta_{k,t}^h\right)}{\sum_{h\in\mathcal{H}_t} W_t^h} = D_t^m + \sum_{k=1}^{K} \eta_{k,t}^m,$$

we conclude that the proposition holds. ■

The market portfolio can differ from the tangency portfolio. The aggregate investor selects a portfolio with a suboptimal Sharpe ratio in order to hedge against adverse variation in the states.

We now derive a multi-beta asset pricing equation similar to Breeden (1979), which shows that the model has $K+1$ pricing factors: the market $\boldsymbol{m_t}$ and the K long-short portfolios $\boldsymbol{f_{k,t}}$. Let $\mu_{m,t}$ denote the expected return on the market portfolio and let $\boldsymbol{\mu_{f,t}}$ denote the vector of expected returns on the pricing portfolios at t.

Proposition 3 (Excess returns) *The excess returns on risky assets satisfy*

$$\boldsymbol{\mu_t} - r\mathbf{1} = \boldsymbol{\beta'_{i,m}}\left(\mu_{m,t} - r\right) + \boldsymbol{\beta'_{i,f}}\left(\boldsymbol{\mu_{f,t}} - r\mathbf{1}\right), \tag{IA-34}$$

where $\left[\boldsymbol{\beta'_{im}}, \boldsymbol{\beta'_{if}}\right]'$ is the $(K+1)\times I$ matrix of multiple-regression betas of returns on the market portfolio $\boldsymbol{m_t}$ and the pricing portfolios $\boldsymbol{f_{k,t}}$ $(k = 1, \cdots, K)$.

Proof. By (IA-22) and (IA-23), the vector of excess returns satisfies $\boldsymbol{\mu_t} - r\mathbf{1} = (\mu_{\tau,t} - r)\sigma_{\tau,t}^{-2}\boldsymbol{\Sigma}_t\boldsymbol{\tau_t}$. We use (IA-31) to substitute out the tangency portfolio:

$$\boldsymbol{\mu_t} - r\mathbf{1} = A_t \boldsymbol{\Sigma_t} \left(w_t^m \boldsymbol{m_t} - \sum_{k=1}^{K} \eta_{k,t}^m \boldsymbol{f_{k,t}} \right), \tag{IA-35}$$

where $A_t = (\mu_{\tau,t} - r)/(w_t^m \sigma_{\tau,t}^2)$. Let $\boldsymbol{\Sigma_{im}} = \boldsymbol{\Sigma_t m_t}$ denote the $I \times 1$ covariance vector between the I assets and the market portfolio, $\boldsymbol{\Sigma_{if}} = [\boldsymbol{\Sigma_t}\ \boldsymbol{f_{1,t}}, \cdots, \boldsymbol{\Sigma_t}\ \boldsymbol{f_{K,t}}]$ the $I \times K$ covariance matrix between the assets and the long-short portfolios, and let $\boldsymbol{\Sigma_{i,mf}} = [\boldsymbol{\Sigma_{im}}, \boldsymbol{\Sigma_{if}}]$. We can then re-express equation (IA-35) in vector form:

$$\boldsymbol{\mu_t} - r\mathbf{1} = A_t \boldsymbol{\Sigma_{i,mf}} \begin{pmatrix} w_t^m \\ -\boldsymbol{\eta_t^m} \end{pmatrix}, \tag{IA-36}$$

where $\boldsymbol{\eta_t^m}$ is the $K \times 1$ vector of all the $\eta_{k,t}^m$.

From (IA-36), we can express the risk premium on the market $\boldsymbol{m_t}$ and the portfolios $\boldsymbol{f_{k,t}}$ as:

$$\begin{pmatrix} \mu_{m,t} - r \\ \boldsymbol{\mu_{f,t}} - r\mathbf{1} \end{pmatrix} = A_t \boldsymbol{\Sigma_{mf,mf}} \begin{pmatrix} w_t^m \\ -\boldsymbol{\eta_t^m} \end{pmatrix} \tag{IA-37}$$

where $\boldsymbol{\Sigma_{mf,mf}}$ is the $(K+1) \times (K+1)$ covariance matrix of the market and long-short portfolio returns. We infer that

$$A_t \begin{pmatrix} w_t^m \\ -\boldsymbol{\eta_t^m} \end{pmatrix} = \boldsymbol{\Sigma_{mf,mf}^{-1}} \begin{pmatrix} \mu_{m,t} - r \\ \boldsymbol{\mu_{f,t}} - r\mathbf{1} \end{pmatrix} \tag{IA-38}$$

We plug (IA-38) into (IA-36) and obtain

$$\boldsymbol{\mu_t} - r\mathbf{1} = \boldsymbol{\beta'_{i,mf}} \begin{pmatrix} \mu_{m,t} - r \\ \boldsymbol{\mu_{f,t}} - r\mathbf{1} \end{pmatrix}, \tag{IA-39}$$

where $\boldsymbol{\beta_{i,mf}} = \boldsymbol{\Sigma_{mf,mf}^{-1}} \boldsymbol{\Sigma'_{i,mf}}$. We let $\boldsymbol{\beta'_{i,mf}} = [\boldsymbol{\beta'_{im}}, \boldsymbol{\beta'_{if}}]'$ and conclude that the proposition holds. ■

VIII.D Equilibrium Portfolio Tilts and Factor Loadings

In an early paper on the ICAPM, Long (1974) investigates the equilibrium properties of *complete* financial portfolios. In this section, we derive related results on the cross-section of *risky* portfolios, which readily tie to the empirical results in the main text.

In the standard CAPM, the risky portfolio of every agent coincides with the market portfolio. In a multifactor setup, agents may exhibit equilibrium deviations from the market portfolio, which depend on their respective levels of risk tolerance and exposures to the K states.

Proposition 4 (Equilibrium portfolio tilts) *In equilibrium, the tilt of the risky portfolio held by each agent $h \in \mathcal{H}_t$ is given by*

$$\boldsymbol{\omega}_t^h - \boldsymbol{m}_t = \sum_{k=1}^{K} v_{k,t}^h \, \boldsymbol{f}_{k,t}, \tag{IA-40}$$

where

$$v_{k,t}^h = \frac{\eta_{k,t}^h}{w_t^h} - \frac{\eta_{k,t}^m}{w_t^m} \tag{IA-41}$$

is the agent's loading on the k^{th} factor. Furthermore, the aggregate tilt on each factor is equal to zero: $\sum_{h=1}^{H} w_t^h W_t^h v_{k,t}^h = 0$ for all k.

Proof. We know from (IA-27) that the risky portfolio of agent h satisfies

$$\boldsymbol{\omega}_t^h = \boldsymbol{\tau}_t + \sum_{k=1}^{K} \frac{\eta_{k,t}^h}{w_t^h} \boldsymbol{f}_{k,t} \tag{IA-42}$$

We subtract the market portfolio, given by (IA-31), from the agent's risky portfolio (IA-42), and obtain that (IA-40) and (IA-41) hold. Furthermore, equation (IA-41) implies that

$$\sum_{h=1}^{H} w_t^h W_t^h v_{k,t}^h = \sum_{h=1}^{H} W_t^h \eta_{k,t}^h - \frac{\eta_{k,t}^m}{w_t^m} \left(\sum_{h=1}^{H} w_t^h W_t^h \right) = \sum_{h=1}^{H} W_t^h \eta_{k,t}^h - \eta_{k,t}^m \left(\sum_{h=1}^{H} W_t^h \right),$$

and we conclude from definition (IA-32) that the proposition holds. ■

Equation (IA-40) highlights that an agent tilts away from the market portfolio if his relative state sensitivity, $\eta_{k,t}^h / w_t^h$, differs from the relative sensitivity of the aggregate agent, $\eta_{m,t}^h / w_t^m$.

Recall that for every agent h, the ratio $\eta^h_{k,t}/w^h_t$ indicates how much the agent chooses to deviate from the tangency portfolio. By (IA-31), the ratios $\eta^m_{k,t}/w^m_t$ control the market portfolio's deviation from efficiency. Therefore, agents have a tilt relative to the market portfolio if their mix of $\boldsymbol{\tau_t}$ and $\boldsymbol{f_{k,t}}$ differs from the mix of the aggregate investor.

Overall, the ICAPM economy has the following properties. Investors earn excess returns for bearing market risk or any of the state risks. The market portfolio is a modified version of the tangency portfolio that includes a hedge for each state risk. Investors can choose risky portfolios other the market portfolio in equilibrium. Based on their risk tolerance and sensitivity to state risk, some investors tilt toward the high-state risk stocks and hold the premium, while other investors prefer to tilt away and hedge further.

VIII.E Local and Foreign Investors

It is natural to ask if the results of the previous sections hold when financial markets are integrated and foreign investors can potentially affect the cross-sectional distribution of the value tilt. Consider the general setting developed in the previous sections and suppose that the set of agents $\mathcal{H}_t$ is partitioned into a subset $\mathcal{H}^L_t$ of *local* investors and a subset $\mathcal{H}^F_t$ of *foreign* investors. All agents have the same unrestricted access to all assets. There may be systematic differences in wealth and preferences across the two groups but we impose no particular structure.

The global model yields two main insights. First, *within* a group, the cross-section of equilibrium tilts is driven by the levels of risk tolerance and sensitivity to state risk of agents within the group. To illustrate this point, consider two local investors i and j. By (IA-27), their tilts differ by

$$\boldsymbol{\omega^i_t} - \boldsymbol{\omega^j_t} = \sum_{k=1}^{K} \left(\frac{\eta^i_{k,t}}{w^i_t} - \frac{\eta^j_{k,t}}{w^j_t} \right) \boldsymbol{f_{k,t}} \tag{IA-43}$$

Therefore, differences in portfolio tilts among local investors are driven by differences in their risk tolerance and sensitivity to state risk.

Second, domestic and foreign investors can have different average tilts if there exist systematic differences in their risk profiles. Consider the local and foreign aggregate investors (L and F) holding the aggregate portfolios of, respectively, local and foreign investors. Their risky portfolios are by definition given by:

$$\boldsymbol{\omega_t^L} = \frac{\sum_{h\in\mathcal{H}_t^L} w_t^h W_t^h \boldsymbol{\omega_t^h}}{\sum_{h\in\mathcal{H}_t^L} w_t^h W_t^h}, \quad \boldsymbol{\omega_t^F} = \frac{\sum_{h\in\mathcal{H}_t^F} w_t^h W_t^h \boldsymbol{\omega_t^h}}{\sum_{h\in\mathcal{H}_t^F} w_t^h W_t^h}.$$

The tilt of the local aggregate investor is directly related to differences in preferences with the aggregate foreign investor, as we now show.

Proposition 5 (Tilt of local investors) *The risky portfolio of the local investor satisfies:*

$$\boldsymbol{\omega_t^L} - \boldsymbol{m}_t = (1-s_t^L) \sum_{k=1}^{K} \left(\frac{\eta_{k,t}^L}{w_t^L} - \frac{\eta_{k,t}^F}{w_t^F} \right) \boldsymbol{f_{k,t}} \tag{IA-44}$$

where $s_t^L = \sum_{h\in\mathcal{H}_t^L} w_t^h W_t^h / \sum_{h\in\mathcal{H}_t} w_t^h W_t^h$ *is the proportion of risky assets held by local investors, and*

$$D_t^i = \frac{\sum_{h\in\mathcal{H}_t^i} W_t^h D_t^h}{\sum_{h\in\mathcal{H}_t^i} W_t^h}, \quad \eta_{k,t}^i = \frac{\sum_{h\in\mathcal{H}_t^i} W_t^h \eta_{k,t}^h}{\sum_{h\in\mathcal{H}_t^i} W_t^h}, \quad w_t^i = D_t^i + \sum_{k=1}^{K} \eta_{k,t}^i,$$

for each $i \in \{L,F\}$.

For example, if local investors are more exposed to the state variable than foreign investors, they tilt their risky portfolios toward low-state risk stocks, whereas foreign investors have opposite tilts.

Proof. As in Proposition 2, the portfolio of each aggregate agent satisfies:

$$\boldsymbol{\omega_t^i} = \boldsymbol{\tau_t} + \sum_{k=1}^{K} \frac{\eta_{k,t}^i}{w_t^i} \boldsymbol{f_{k,t}}, \quad i = L,F \tag{IA-45}$$

The tilt of the local aggregate agent is:

$$\boldsymbol{\omega_t^L} - \boldsymbol{m}_t = \boldsymbol{\omega_t^L} - [s_t^L \boldsymbol{\omega_t^L} + (1-s_t^L)\boldsymbol{\omega_t^F}] = (1-s_t^L)(\boldsymbol{\omega_t^L} - \boldsymbol{\omega_t^F}),$$

and we conclude from (IA-45) that the proposition holds. ■

VIII.F Application to the Value Premium

We now apply the multi-factor setting to value and growth investing. We consider a specification with $K = 2$ states: aggregate income L_t and the market price of risk λ_t.[30] This section is not a quantitative exercise but shows how to incorporate the relationships between the value tilt and variables such as age, wealth, human capital, and income risk in a general equilibrium setting. The risky assets are equities and their number I remains arbitrary. We denote by

$$\hat{\boldsymbol{z}}_t = \begin{pmatrix} z_{1,t} \\ \vdots \\ z_{I,t} \end{pmatrix}$$

the vector containing the first I components of the Brownian motion, so that $\boldsymbol{z_t} = (\hat{\boldsymbol{z}}_t', z_{I+1,t}, z_{I+2,t})'$.

Aggregate labor income is assumed to satisfy:

$$\frac{dL_t}{L_t} = \mu_L dt + \sigma_L \left[\boldsymbol{\rho}_L' d\hat{\boldsymbol{z}}_t + \sqrt{1 - \|\boldsymbol{\rho}_L\|^2}\, dz_{I+1,t} \right],$$

where $\boldsymbol{\rho_L}$ is the $I \times 1$ vector of correlations between L_t and $\hat{\boldsymbol{z}}_t$. All agents are subject to the common aggregate income shock. The market price of risk is assumed to follow an Ornstein-Uhlenbeck process:

$$d\lambda_t = \kappa(\bar{\lambda} - \lambda_t)\, dt + \sigma_\lambda \left[\boldsymbol{\rho}_\lambda' d\hat{\boldsymbol{z}}_t + \sqrt{1 - \|\boldsymbol{\rho}_\lambda\|^2}\, dz_{I+2,t} \right],$$

where $\boldsymbol{\rho_\lambda}$ is the $I \times 1$ vector of correlations between λ_t and $\hat{\boldsymbol{z}}_t$.

We assume that the risky assets are stocks and the dynamics of returns $\boldsymbol{R_t} = (R_t^1, \ldots R_t^I)'$ are specified by

$$dR_{i,t} = \mu_{i,t} dt + \sigma_i\, dz_{i,t}.$$

where $\mu_{i,t} = r + \sigma_i \lambda_t$. Stocks have constant volatilities but have time-varying drifts, which are driven by the time-varying market price of risk. We observe that each stock is perfectly corre-

[30] See Cochrane (2011) for a recent review of the economic mechanisms driving time-variation in the market price of risk.

lated with a component of $\hat{\boldsymbol{z}}_t$, so that only $\hat{\boldsymbol{z}}_t$ is spanned by the assets. Markets are complete if $\|\boldsymbol{\rho_\lambda}\| = \|\boldsymbol{\rho_L}\| = 1$, and are incomplete otherwise. Since the vectors $\boldsymbol{\rho_L}$ and $\boldsymbol{\rho_\lambda}$ that define the state dynamics have heterogeneous components, stocks can have different exposures to λ_t and L_t.

The risky assets are composed of value and growth stocks. Consistent with prior literature, we assume that growth stocks provide a better hedge against both state variables than value stocks. That is, growth stocks co-vary more negatively with discount rate news (Campbell and Vuolteenaho 2004) and are less positively correlated to labor income growth (Fama and French 1995) than value stocks.

The factor portfolios $\boldsymbol{f_{L,t}}$ and $\boldsymbol{f_{\lambda,t}}$ are related to the HML portfolio because they involve long-short positions in stocks exposed to the factors. However, the signs of their positions differ. As we discussed in case E1 of Section *VIII.B*, labor income growth is *positively* correlated to the typical stock and is most correlated to value stocks; the factor portfolio $\boldsymbol{f_{L,t}}$ is therefore long on value stocks and short on growth stocks, just like HML. By contrast, as in case E2, discount rate news are *negatively* correlated with the typical stock and are most negatively correlated with growth stocks; as a result, the factor portfolio $\boldsymbol{f_{\lambda,t}}$ is long on growth stocks and short on value stocks, unlike HML. For simplicity, we therefore define $\boldsymbol{f^*_{\lambda,t}} = -\boldsymbol{f_{\lambda,t}}$ as the short version of $\boldsymbol{f_{\lambda,t}}$. Both $\boldsymbol{f_{L,t}}$ and $\boldsymbol{f^*_{\lambda,t}}$ are positively related to HML. We also denote by $\beta^*_{i,\lambda} = -\beta_{i,\lambda}$ the regression coefficient of asset i on $\boldsymbol{f^*_{\lambda,t}}$.

We now turn to the hedging demand of individual investors. By the envelope condition (IA-29), we know that

$$J^h_{WL} = U^h_{cc}\frac{\partial c^h}{\partial L} \quad \text{and} \quad J^h_{W\lambda} = U^h_{cc}\frac{\partial c^h}{\partial \lambda}. \tag{IA-46}$$

We therefore infer that

$$J^h_{WL} < 0 \quad \text{and} \quad J^h_{W\lambda} < 0$$

for every $h \in \mathcal{H}_t$ under a wide range of utility functions and labor income specifications. For instance, when every agent receives a fraction of aggregate income and aggregate income is tradable, individual labor income can be sold off and the proceeds are a safe component of financial wealth, so that $\partial c^h/\partial L > 0$ and $J^h_{WL} < 0$ (Merton 1971).[31] Similarly, Wachter (2002) considers a complete-market version of our setup with individual isoelastic utility $U^h(c) = e^{-\rho_h t} c^{1-\gamma_h}/(1-\gamma_h)$, and shows that $J^h_{W\lambda} < 0$ if $\gamma_h > 1$.

As (IA-28) shows, the sign of the hedging demands also depends on the sign of the covariance between the assets and the factors, so that $\eta^h_{L,t} < 0$ and $\eta^h_{\lambda,t} > 0$. For this reason, we henceforth use absolute values to facilitate the interpretation of the results, and note that high values of $|\eta^h_{L,t}|$ and $|\eta^h_{\lambda,t}|$ both correspond to high sensitivity to state risk. The equilibrium cross-section of risk premia and portfolio holdings can then be summarized as follows.

$$\text{Risk Premia:} \qquad \mu^e_{i,t} = \beta_{i,m}\,\mu^e_{m,t} + \beta_{i,L}\,\mu^e_{L,t} + \beta^*_{i,\lambda}\,\mu^e_{\lambda^*,t},$$

$$\text{Market Portfolio:} \qquad \boldsymbol{m_t} = \boldsymbol{\tau_t} - \frac{|\eta^m_{L,t}|}{w^m_t}\,\boldsymbol{f_{L,t}} - \frac{|\eta^m_{\lambda,t}|}{w^m_t}\,\boldsymbol{f^*_{\lambda,t}},$$

$$\text{Risky Portfolio:} \qquad \boldsymbol{\omega^h_t} = \boldsymbol{m_t} + \left(\frac{|\eta^m_{L,t}|}{w^m_t} - \frac{|\eta^h_{L,t}|}{w^h_t}\right)\boldsymbol{f_{L,t}} + \left(\frac{|\eta^m_{\lambda,t}|}{w^m_t} - \frac{|\eta^h_{\lambda,t}|}{w^h_t}\right)\boldsymbol{f^*_{\lambda,t}},$$

where $\mu^e_{i,t}$ denotes the excess return on asset i, $\mu^e_{m,t}$ the excess return on the market portfolio, $\mu^e_{L,t}$ the excess return on $f_{L,t}$, and $\mu^e_{\lambda^*,t}$ the negative of the excess return on $f_{\lambda,t}$,

Value stocks earn a premium for being highly exposed to λ_t and L_t. However, since growth stocks provide a hedge against adverse realizations of the state, market participants are willing to give up part of the value premium and choose a market portfolio that is more tilted toward growth stocks than the tangency portfolio. The decision to choose a value tilt depends on three ingredients.

1. A low sensitivity to aggregate income shocks (low $|\eta^h_{L,t}|$). The sensitivity is low if the household has decumulated its stock of human capital stock or receives a labor income that is relatively insensitive to aggregate income shocks.

2. A low sensitivity to discount shocks (low $|\eta^h_{\lambda,t}|$). The sensitivity is low if the household has a short horizon and thus a low need to hedge changes in the investment opportunity set.

[31] More generally, the inequalities $J^h_{WL} < 0$ and $\partial c^h/\partial L > 0$ hold when aggregate income is partially diversifiable and the economy satisfies mild regularity conditions (see, e.g., Duffie, Fleming, Soner and Zariphopoulou 1997 and Viceira 2001).

3. A low curvature of the value function (low $\gamma_t^h = -W_t^h J_{WW}^h / J_W^h$) and therefore a high risky share (high w_t^h). This can arise if the felicity function U^h exhibits low risk aversion, or if the household holds substantial liquid wealth, earns safe incomes, and has low debt.[32]

As Cochrane (2007) puts it, since some investors tilt their portfolios toward value stocks to enjoy the value premium, other investors must have a growth tilt. These growth investors are aware of the performance benefits of value investing but prefer to stay away from value stocks because they are already highly sensitive to state risk. The high sensitivity of growth investors can stem from high risk aversion or high exposure to state-risk (high $|\eta_{L,t}^h|$ and $|\eta_{\lambda,t}^h|$), for instance because they are young, work in cyclical sectors, or have weak balance sheets.

[32] See Campbell and Viceira (2000) and the references therein.

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Table IA.1
Summary Statistics on the Main Nordic Exchanges

This table reports summary statistics on the four main Nordic exchanges: Copenhagen (CSE), Helsinki (HEX), Oslo (OSE), and Stockholm (SSE). For each exchange, we report periods of data availability, the number of listed stocks, the aggregate market capitalization of all listed stocks, and the average market capitalization of a stock listed on the exchange. Stocks listed on multiple exchanges are assigned to a single exchange by following the rules stated in Section II.A of this Internet Appendix. Market values are computed at the end of 2003. The bottom row reports the total number of stocks listed on all four exchanges, the aggregate market capitalization of the exchanges, and the average market capitalization of a company listed on one of the main Nordic exchanges.

Exchange	Available Equity Data		Number of Listed	Aggregate Market Value	Average Market Value
	Market	Book	Stocks	($ Billion)	($ Million)
Copenhagen Stock Exchange	1993+	2002+	195	121	677
Helsinki Stock Exchange	1986+	1987-1999, 2005+	127	75	640
Oslo Stock Exchange	1985+	2000+	164	87	609
Stockholm Stock Exchange	1985+	1985+	257	437	1,813
Total			743	720	1,049

Table IA.2
Summary Statistics on the Swedish Factors

The table reports the average and standard deviation of the market, value, size, and momentum factors in monthly and annualized units. We also report the standard error in monthly units and the confidence interval in annualized units. The construction of the factors is described in Section II.A of this Internet Appendix. The estimates are based on monthly returns from 1985 to 2009, market capitalizations at the semiannual frequency, and book values at the end of each year provided by FINBAS.

	Monthly			Annualized			
	Mean	Standard Deviation	Standard Error	Mean	Standard Deviation	95% Confidence Interval	
						Lower Bound	Upper Bound
Market portfolio return (MKT)	0.79%	6.52%	0.38%	9.90%	22.59%	0.54%	20.05%
Value factor (HML)	0.81%	3.40%	0.20%	10.16%	11.78%	5.18%	15.37%
Size factor (SMB)	-0.16%	1.62%	0.09%	-1.90%	5.61%	-4.06%	0.30%
Momentum factor (MOM)	1.79%	6.49%	0.38%	23.73%	22.48%	13.34%	34.98%

Table IA.3
CAPM Analysis of the Pricing Portfolios

The table reports CAPM regressions of the pricing portfolios on market excess returns. We compute the CAPM alpha, CAPM beta, and sample mean return for size and book-to-market portfolios in Panel A, and for momentum portfolios in Panel B. The construction of the portfolios is described in Section II.A of this Internet Appendix. The estimates are based on monthly real returns from 1985 to 2009, market capitalizations at the semiannual frequency, and book values at the end of each year provided by FINBAS. All portfolios are equally-weighted and rebalanced annually. The size portfolios (Small and Big) are constructed at the end of each June using the end-of-June market equity. The book-to-market portfolios (High, Medium, and Low) are constructed at the end of each December using December book-to-market ratios. The momentum portfolios (Low and High) are constructed at the end of each June using the return over the past 12 months. The market excess return is proxied by the difference between the return on the Stockholm Stock Exchange SIXRX index and the yield on the 1-month Swedish Treasury bill.

Panel A: CAPM Regression of the Size and Book-to-Market Portfolios

	CAPM Alpha			CAPM Beta			Sample Mean Return		
	Low	Medium	High	Low	Medium	High	Low	Medium	High
Small	-0.008	-0.001	0.002	0.964	0.890	0.812	0.003	0.009	0.012
Big	-0.035	0.001	0.006	1.002	0.886	0.889	0.007	0.011	0.016

Panel B: CAPM Regression of the Momentum Portfolios

	CAPM Alpha	CAPM Beta	Sample Mean Return
Low	-0.001	1.006	-0.003
High	0.001	0.739	0.015

Table IA.4
Forecasting GDP Growth with Pricing and Macro Factors

This table replicates the analysis of Liew and Vassalou (2000) in the context of Sweden. We report regressions of Gross Domestic Product (GDP) growth in year *t* on pricing and macro factors in year *t*-1 between 1987 and 2009. The variables MKT, HML, SMB and MOM denote the Fama-French-Carhart pricing factors. TB denotes the 1-month Treasury bill yield, TERM is the difference between the yield on a ten-year government bond and the TB rate, and IDP is the growth rate of industrial production. We use quarterly data from 1994 onwards and annual data from 1987 to 1994. IDP growth is only available since 2002. The t-statistics are corrected for heteroskedasticity and serial correlation, up to three lags, using the Newey and West (1987) estimator.

	Dependent Variable: GDP Growth													
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
MKT	0.05	4.87							0.06	5.22	0.05	4.51	0.06	4.90
HML			0.00	0.12					0.03	2.41			0.03	2.43
SMB					0.06	1.56					-0.01	-0.35	-0.02	-0.56
MOM							0.00	-0.51						
Adjusted R^2	0.34		-0.01		0.01		-0.01		0.39		0.33		0.38	

	Dependent Variable: GDP Growth											
	(8)		(9)		(10)		(11)		(12)		(13)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
MKT	0.05	4.65	0.07	4.38	0.04	4.08	0.04	2.27	0.05	4.32	0.06	3.29
HML	0.03	2.16	0.12	4.13					0.03	2.13	0.10	2.96
SMB					-0.03	-0.67	-0.18	-3.23	-0.03	-1.00	-0.11	-1.43
TB	0.04	0.55	0.52	1.76	0.05	0.61	0.85	2.19	0.05	0.70	0.44	1.35
TERM	0.67	4.18	0.77	0.95	0.74	3.82	2.73	4.27	0.71	4.03	1.13	1.31
IDP			-0.07	-0.83			0.19	2.48			0.02	0.18
Adjusted R^2	0.48		0.73		0.44		0.68		0.48		0.75	

Table IA.5
Forecasting Aggregate Income Growth with Pricing and Macro Factors

We report regressions of aggregate income growth in year *t* on pricing and macro factors in year *t*-1. The analysis is conducted for the quarterly real income growth in the private sector series between 2001 and 2009 compiled by Statistics Sweden. The variables MKT, HML, SMB and MOM denote the Fama-French-Carhart pricing factors. TB denotes the 1-month Treasury bill yield, TERM is the difference between the yield on a ten-year government bond and the TB rate, and IDP is the growth rate of industrial production. IDP growth is only available since 2002. The t-statistics are corrected for heteroskedasticity and serial correlation, up to three lags, using the Newey and West (1987) estimator.

	Dependent Variable: Aggregate Income Growth													
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
MKT	0.06	8.36							0.06	8.60	0.06	7.85	0.06	8.32
HML			-0.01	-0.94					0.02	2.34			0.02	2.15
SMB					0.08	1.29					0.00	0.01	0.04	0.58
MOM							-0.01	-1.39						
Adjusted R^2	0.61		-0.02		0.00		0.00		0.63		0.60		0.62	

	Dependent Variable: Aggregate Income Growth											
	(8)		(9)		(10)		(11)		(12)		(13)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
MKT	0.05	6.57	0.04	3.50	0.04	5.26	0.03	2.56	0.05	6.37	0.04	2.93
HML	0.04	4.28	0.04	1.73					0.04	3.90	0.04	1.42
SMB					-0.03	-0.69	-0.03	-0.92	0.01	0.44	-0.01	-0.22
TB	-1.12	-3.81	-1.21	-3.65	-0.74	-2.43	-1.06	-2.95	-1.11	-3.82	-1.21	-3.55
TERM	-0.64	-1.82	-0.55	-1.22	-0.06	-0.15	0.10	0.24	-0.64	-1.82	-0.52	-0.97
IDP			0.05	0.96			0.12	2.50			0.06	0.76
Adjusted R^2	0.78		0.77		0.71		0.75		0.78		0.76	

Table IA.6
Stock Characteristics

This table reports summary statistics on stock characteristics (Panel A) and their links to the value loading (Panel B). We consider the price-to-earnings ratio (P/E), the book-to-market ratio (B/M), the debt-to-asset ratio (D/A), the return on equity (ROE), and the dividend yield. The D/A ratio is computed using market values. Panel A reports the median of each characteristic and its Spearman correlation with the value factor, as well the number of firms for which sufficient data are available to compute the characteristic. Panel B reports the average percentile of the characteristic for four portfolios of stocks sorted by value loading. All characteristics are computed in 2003.

Panel A: Summary Statistics of Stock Characteristics

	P/E	B/M	D/A	ROE	Div. Yield
Median	17.35	0.49	0.36	0.03	0.01
Spearman correlation with value loading	-0.32	0.36	0.32	-0.07	0.60
Sample size	170	303	300	166	316

Panel B: Average Characteristic Percentiles of Stocks Sorted by Value Loading

	Percentiles				
	P/E	B/M	D/A	ROE	Div. Yield
Value loading quartile:					
1 (Growth)	67.7%	38.6%	39.2%	53.4%	27.7%
2	57.4%	42.8%	44.4%	51.3%	39.5%
3	46.7%	52.3%	52.1%	50.6%	61.5%
4 (Value)	41.2%	63.9%	63.1%	46.1%	69.8%

Table IA.7
Cross-Sectional Distribution of the Value Loading
Investor Subgroups

The table reports summary statistics on the cross-sectional distribution of the value loading at the end of 2003 for some of the main household subsamples and portfolios used in the paper. For each group, the columns report (i) the value-weighted and equal-weighted means, (ii) the 10^{th}, 25^{th}, 50^{th}, 75^{th}, and 90^{th} percentiles, and (iii) the spread between the top and bottom deciles.

	Value Loading							
	Means		Cross-Sectional Distribution					Spread
	Value-Weighted	Equal-Weighted	10th	25th	50th	75th	90th	(90th - 10th)
All participants								
- Risky portfolio	-0.26	-0.30	-0.94	-0.46	-0.18	0.00	0.10	1.04
- Stock portfolio	-0.36	-0.58	-1.20	-1.09	-0.53	0.11	0.39	1.58
- Fund portfolio	-0.18	-0.20	-0.57	-0.30	-0.14	0.00	0.08	0.65
Fundholders								
- Risky portfolio	-0.25	-0.25	-0.71	-0.40	-0.17	-0.01	0.09	0.80
- Stock portfolio	-0.35	-0.57	-1.17	-1.06	-0.52	0.10	0.38	1.55
- Fund portfolio	-0.18	-0.20	-0.57	-0.30	-0.14	0.00	0.08	0.65
Direct stockholders								
- Risky portfolio	-0.28	-0.38	-1.07	-0.61	-0.24	-0.02	0.11	1.18
- Stock portfolio	-0.36	-0.58	-1.20	-1.09	-0.53	0.11	0.39	1.58
- Fund portfolio	-0.19	-0.22	-0.58	-0.33	-0.16	-0.03	0.07	0.65
Direct stockholders with 1 or 2 stocks								
- Risky portfolio	-0.27	-0.38	-1.11	-0.65	-0.23	0.01	0.11	1.22
- Stock portfolio	-0.64	-0.62	-1.14	-1.14	-1.00	0.11	0.44	1.58
- Fund portfolio	-0.17	-0.21	-0.58	-0.31	-0.14	-0.01	0.07	0.65
Direct stockholders with 3 or 4 stocks								
- Risky portfolio	-0.29	-0.41	-1.05	-0.62	-0.28	-0.05	0.10	1.16
- Stock portfolio	-0.49	-0.59	-1.37	-1.07	-0.54	0.03	0.36	1.73
- Fund portfolio	-0.18	-0.22	-0.57	-0.33	-0.16	-0.04	0.06	0.63
Direct stockholders with 5+ stocks								
- Risky portfolio	-0.28	-0.38	-0.98	-0.56	-0.25	-0.05	0.10	1.08
- Stock portfolio	-0.32	-0.48	-1.30	-0.83	-0.33	0.02	0.25	1.56
- Fund portfolio	-0.21	-0.24	-0.60	-0.35	-0.18	-0.06	0.03	0.63

Table IA.8
Cross-Sectional Distribution of the Value Loading
Standard Errors

This table reports standards errors for the value loading mean and percentiles reported in Table II of the main text and in Table IA.7 of this Internet Appendix.

	Standard Error of Value Loading Statistics						
	Means		Percentiles				
	Value-Weighted	Equal-Weighted	10th	25th	50th	75th	90th
All participants							
- Risky portfolio	0.015	0.002	0.006	0.003	0.001	0.001	0.000
- Stock portfolio	0.018	0.004	0.008	0.003	0.009	0.001	0.003
- Fund portfolio	0.004	0.001	0.004	0.002	0.001	0.001	0.000
Fundholders							
- Risky portfolio	0.015	0.002	0.005	0.003	0.002	0.000	0.001
- Stock portfolio	0.018	0.005	0.007	0.004	0.010	0.004	0.003
- Fund portfolio	0.004	0.001	0.004	0.002	0.001	0.001	0.000
Direct stockholders							
- Risky portfolio	0.017	0.003	0.006	0.005	0.003	0.002	0.000
- Stock portfolio	0.018	0.004	0.008	0.003	0.009	0.001	0.003
- Fund portfolio	0.005	0.002	0.005	0.002	0.002	0.002	0.001
Direct stockholders with 1 or 2 stocks							
- Risky portfolio	0.011	0.007	0.013	0.011	0.006	0.004	0.005
- Stock portfolio	0.015	0.010	0.024	0.005	0.016	0.010	0.010
- Fund portfolio	0.004	0.004	0.013	0.006	0.004	0.003	0.003
Direct stockholders with 3 or 4 stocks							
- Risky portfolio	0.021	0.007	0.013	0.011	0.006	0.004	0.005
- Stock portfolio	0.022	0.010	0.024	0.005	0.016	0.010	0.010
- Fund portfolio	0.004	0.004	0.013	0.006	0.004	0.003	0.003
Direct stockholders with 5+ stocks							
- Risky portfolio	0.026	0.005	0.012	0.007	0.004	0.003	0.004
- Stock portfolio	0.027	0.007	0.015	0.010	0.008	0.005	0.006
- Fund portfolio	0.007	0.003	0.009	0.004	0.003	0.002	0.003

Table IA.9

Full Version of Table V, Panel A

Real Estate Interacted with Leverage

This table reports the full version of Table V, Panel A, in the main text. We regress the value loading on (i) residential real estate, (ii) residential real estate interacted with leverage, (iii) commercial real estate, (iv) commercial real estate interacted with leverage, and (v) all the other characteristics of the baseline regression, and year, industry, and county fixed effects. The value loading is computed at the level of the risky portfolio in column (1), the stock portfolio in column (2), and the fund portfolio in column (3). The computations are based on the fixed random sample of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.015	10.47	0.045	13.83	0.012	13.37
Log residential real estate	0.000	1.37	0.003	3.79	0.000	-0.44
Log commercial real estate	0.001	2.01	0.007	9.87	0.000	-0.88
Log residential real estate × Leverage ratio	-0.001	-4.28	-0.004	-4.88	0.000	-1.40
Log commercial real estate × Leverage ratio	-0.001	-3.13	0.000	-0.45	-0.001	-3.48
Leverage ratio	-0.012	-4.11	-0.040	-5.10	-0.004	-2.29
Human Capital and Income Risk						
Log human capital	-0.049	-8.88	-0.097	-8.85	-0.020	-6.28
Log income	-0.046	-11.33	-0.043	-5.60	-0.029	-12.91
Self-employment dummy	-0.033	-4.22	-0.035	-2.47	-0.011	-2.52
Unemployment dummy	-0.018	-4.02	-0.022	-2.06	-0.005	-1.98
Conditional income volatility	-0.350	-21.66	-0.330	-10.73	-0.115	-13.18
Demographic Characteristics						
Age	0.003	15.91	0.009	23.24	0.001	5.53
Male household head dummy	-0.062	-18.52	-0.106	-13.61	-0.013	-5.87
High school dummy	-0.014	-3.38	-0.035	-3.44	-0.006	-2.14
Post-high school dummy	-0.016	-4.61	0.016	2.02	-0.015	-6.88
Economics education dummy	-0.027	-5.88	-0.011	-1.04	-0.014	-4.73
Immigration dummy	-0.066	-11.13	-0.135	-10.33	-0.003	-0.95
Family size	0.036	24.78	0.025	7.61	0.017	19.29
Adjusted R^2	2.39%		3.98%		0.95%	
Number of observations	589,561		331,693		523,798	

Table IA.10
Full Version of Table V, Panel B
Impact of New Children

This table reports the full version of Table V, Panel B in the main text. We regress the value loading on (i) a dummy for having at least one child during the year, (ii) a dummy for having twins who were born between 1999 and the year, and (iii) all the other characteristics of the baseline regression, and year, industry, and county fixed effects. The value loading is computed at the level of the risky portfolio in column (1), the stock portfolio in column (2), and the fund portfolio in column (3). The estimation is conducted on a sample of households that includes all newborn twins. All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.012	6.02	0.093	19.73	0.007	5.73
Log residential real estate	0.000	-0.41	0.001	1.11	0.000	-0.09
Log commercial real estate	0.001	3.21	0.008	7.89	0.001	1.94
Leverage ratio	0.000	-0.19	-0.008	-1.58	0.000	0.43
Human Capital and Income Risk						
Log human capital	-0.041	-5.08	-0.089	-5.16	-0.020	-4.42
Log income	-0.013	-2.36	-0.023	-2.20	-0.009	-2.47
Self-employment dummy	-0.050	-4.53	-0.049	-2.15	-0.011	-1.65
Unemployment dummy	-0.018	-2.92	-0.042	-2.51	0.003	0.94
Conditional income volatility	-0.306	-14.92	-0.353	-8.39	-0.074	-5.91
Demographic Characteristics						
Age	0.003	11.79	0.011	15.56	0.001	6.38
Male household head dummy	-0.089	-19.16	-0.120	-10.38	-0.020	-6.87
High school dummy	-0.020	-2.78	-0.052	-2.56	-0.014	-3.03
Post-high school dummy	-0.032	-6.82	0.012	1.07	-0.021	-7.12
Economics education dummy	-0.032	-5.37	-0.016	-1.14	-0.015	-4.18
Immigration dummy	-0.085	-9.97	-0.143	-7.65	-0.002	-0.38
New Child Dummies						
Dummy for having children	0.087	17.21	0.028	2.17	0.026	8.20
Dummy for having twins	-0.020	-2.63	-0.039	-1.83	-0.006	-1.15
Adjusted R^2	1.90%		3.10%		0.50%	
Number of observations	324,964		169,021		293,636	

Table IA.11
Economic Significance
Wealth-Weighted Average Characteristics Used in Table VI

This table reports average characteristics, weighted by household financial wealth, of households headed by 30-, 50-, or 70-year olds at the end of 2003. When a characteristic is used in logarithmic form in the baseline regression, we compute the weighted average of the log characteristic and then take the exponential to facilitate the interpretation of the results.

	Average Characteristics		
	30-Year-Old Head	50-Year-Old Head	70-Year-Old Head
Financial Characteristics			
Financial wealth ($)	62,690	146,087	229,339
Residential real estate ($)	12,990	58,102	22,048
Commercial real estate ($)	1	3	105
Leverage ratio	0.46	0.17	0.04
Human Capital and Income Risk			
Human capital ($)	1,254,133	791,714	390,411
Income ($)	49,412	55,824	67,979
Self-employment dummy	0.05	0.06	0.31
Unemployment dummy	0.07	0.05	0.00
Conditional income volatility	0.17	0.18	0.18
Demographic Characteristics			
Age	30	50	70
Male household head dummy	0.68	0.69	0.98
High school dummy	0.94	0.84	0.67
Post-high school dummy	0.50	0.45	0.02
Economics education dummy	0.18	0.12	0.16
Immigration dummy	0.06	0.06	0.01
Family size	3.21	2.24	1.81

Table IA.12
Economic Significance
Equal-Weighted Average Characteristics

This table reports the equal-weighted average characteristics of a household with a 30-year-old head, a 50-year-old head, or a 70-year-old head at the end of 2003. When a characteristic is used in logarithmic form in the baseline regression, we first compute the equal-weighted average of the log characteristic and then take the exponential to facilitate the interpretation of the results.

	Average Characteristics		
	30-Year-Old Head	50-Year-Old Head	70-Year-Old Head
Financial Characteristics			
Financial wealth ($)	15,866	32,015	66,833
Residential real estate ($)	4,694	17,378	8,022
Commercial real estate ($)	0	1	6
Leverage ratio	0.91	0.41	0.06
Human Capital and Income Risk			
Human capital ($)	1,125,745	679,393	271,022
Income ($)	41,149	42,743	41,190
Self-employment dummy	0.03	0.04	0.36
Unemployment dummy	0.09	0.06	0.00
Conditional income volatility	0.15	0.17	0.17
Demographic Characteristics			
Age	30	50	70
Male household head dummy	0.65	0.64	0.88
High school dummy	0.93	0.78	0.52
Post-high school dummy	0.38	0.35	0.08
Economics education dummy	0.13	0.11	0.12
Immigration dummy	0.08	0.08	0.04
Family size	3.13	2.04	1.72

Table IA.13
Economic Significance
Imputation with Equal-Weighted Characteristics

This table reports the impact on the value loading of life-cycle variation in age and financial characteristics. We use as benchmarks a 30-year old household head, a 50-year-old household head, and a 70-year old household head, to which we assign the equal-weighted average characteristics reported in Table IA.12. The impact of changes in characteristics is assessed using the baseline regression coefficients in Table III. All variables are described in Table A.

	Risky Portfolio		Stock Portfolio		Fund Portfolio	
	30→50	50→70	30→50	50→70	30→50	50→70
Observed change in value loading	0.06	0.13	0.27	0.28	0.01	0.06
Predicted change						
Financial Characteristics						
Log financial wealth	0.012	0.013	0.035	0.037	0.008	0.009
Log residential real estate	0.001	0.000	0.004	-0.003	0.000	0.000
Log commercial real estate	0.001	0.002	0.007	0.012	0.000	0.000
Leverage ratio	0.000	0.000	0.004	0.003	0.000	0.000
Human Capital and Income Risk						
Log human capital	0.026	0.048	0.052	0.095	0.011	0.019
Log income	-0.002	0.002	-0.002	0.002	-0.001	0.001
Self-employment dummy	0.000	-0.011	-0.001	-0.012	0.000	-0.004
Unemployment dummy	0.000	0.001	0.001	0.001	0.000	0.000
Conditional income volatility	-0.005	-0.002	-0.005	-0.002	-0.002	-0.001
Demographic Characteristics						
Age	0.055	0.055	0.177	0.177	0.012	0.012
Male household head dummy	0.000	-0.015	0.001	-0.025	0.000	-0.003
High school dummy	0.002	0.004	0.005	0.009	0.001	0.002
Post-high school dummy	0.000	0.004	0.000	-0.004	0.000	0.004
Economics education dummy	0.001	0.000	0.000	0.000	0.000	0.000
Immigration dummy	0.000	0.003	0.000	0.005	0.000	0.000
Family size	-0.039	-0.011	-0.027	-0.008	-0.018	-0.005
Change due to age and wealth characteristics	**0.093**	**0.118**	**0.277**	**0.322**	**0.030**	**0.041**
Fraction due to age	**58.86%**	**46.22%**	**63.71%**	**54.95%**	**38.36%**	**27.80%**
Fraction due to financial characteristics	**14.52%**	**11.63%**	**18.09%**	**15.03%**	**29.73%**	**22.58%**
Fraction due to human capital and income	**26.62%**	**42.14%**	**18.20%**	**30.02%**	**31.92%**	**49.62%**

Table IA.14
Economic Significance
Interaction of Real Estate and Leverage

This table reports the impact on the value loading of life-cycle variation in age, real estate interacted with leverage, and other financial characteristics. We use as benchmarks a 30-year old household head, a 50-year-old household head, and a 70-year old household head, to which we assign the average wealth-weighted characteristics of households in their cohorts at the end of 2003. The impact of changes in characteristics is assessed using the regression coefficients in Table IA.9. All variables are described in Table A.

	Risky Portfolio		Stock Portfolio		Fund Portfolio	
	30→50	50→70	30→50	50→70	30→50	50→70
Observed change in value loading	0.09	0.14	0.23	0.25	0.02	0.04
Predicted change						
Financial Characteristics						
Log financial wealth	0.013	0.007	0.038	0.020	0.010	0.005
Log residential real estate	0.001	0.000	0.004	-0.003	0.000	0.000
Log commercial real estate	0.001	0.002	0.009	0.024	0.000	-0.001
Log residential real estate × Leverage ratio	0.001	0.000	0.002	0.001	0.000	0.000
Log commercial real estate × Leverage ratio	0.001	0.003	0.000	0.001	0.000	0.002
Leverage ratio	0.004	0.002	0.012	0.005	0.001	0.001
Human Capital and Income Risk						
Log human capital	0.023	0.035	0.045	0.068	0.009	0.014
Log income	-0.006	-0.009	-0.005	-0.008	-0.004	-0.006
Self-employment dummy	0.000	-0.008	0.000	-0.009	0.000	-0.003
Unemployment dummy	0.000	0.001	0.000	0.001	0.000	0.000
Conditional income volatility	-0.004	0.001	-0.003	0.001	-0.001	0.000
Demographic Characteristics						
Age	0.054	0.054	0.175	0.175	0.012	0.012
Male household head dummy	-0.001	-0.018	-0.001	-0.031	0.000	-0.004
High school dummy	0.001	0.002	0.004	0.006	0.001	0.001
Post-high school dummy	0.001	0.007	-0.001	-0.007	0.001	0.006
Economics education dummy	0.002	-0.001	0.001	0.000	0.001	-0.001
Immigration dummy	0.000	0.003	0.001	0.006	0.000	0.000
Family size	-0.035	-0.015	-0.024	-0.011	-0.016	-0.007
Change due to age and wealth characteristics	**0.091**	**0.093**	**0.279**	**0.283**	**0.028**	**0.027**
Fraction due to age	**60.06%**	**58.39%**	**62.75%**	**61.88%**	**40.53%**	**42.22%**
Fraction due to financial characteristics	**21.05%**	**13.86%**	**23.17%**	**16.93%**	**39.44%**	**26.75%**
Fraction due to human capital and income	**18.88%**	**27.75%**	**14.08%**	**21.20%**	**20.02%**	**31.03%**

Table IA.15
Explanatory Power of the Baseline Regression for the Value Ladder

This table investigates the explanatory power of the baseline *household*-level regressions for the *cohort*-level value ladders illustrated in Figure 2 of the main text. For each cohort, we regress the observed average value loading on the predicted loading over the 1999 to 2007 sample period, and tabulate the corresponding R^2 coefficient. The last column reports the average R^2 across cohorts. We build the predicted values so that they are directly comparable to the observed loadings in Figure 2. We compute a cohort's average characteristic in year t as the wealth-weighted average of all households in the cohort, which we then demean to control for changes in the composition of the Swedish stock market. A cohort's predicted value loading each year corresponds to the product of the cohort's characteristics with the selected coefficients from Table III in the main text plus the regression intercept. In Panel A, we predict the value loading using age, financial and real estate wealth, leverage, human capital and income. In Panel B, we predict the value loading using all the variables in Table III. The first cohort contains households with a head aged between 30 and 34 in 1999, while the oldest cohort has a head aged between 65 and 69 in 1999. All computations are based on the fixed random sample of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix

Panel A: Age, Human Capital, and Other Financial Characteristics

	Cohort R^2								Average
	30	35	40	45	50	55	60	65	R^2
Risky portfolio	74.63%	52.07%	57.32%	67.83%	73.18%	89.16%	49.28%	65.82%	66.16%
Stock portfolio	39.11%	34.54%	80.36%	84.94%	87.46%	96.25%	83.53%	83.81%	73.75%

Panel B: All Characteristics

	Cohort R^2								Average
	30	35	40	45	50	55	60	65	R^2
Risky portfolio	67.62%	58.03%	51.10%	8.57%	54.65%	75.40%	2.16%	63.86%	47.67%
Stock portfolio	35.55%	36.93%	77.33%	80.00%	85.77%	94.20%	77.26%	82.88%	71.24%

Table IA.16
Panel Regression of the Value Loading on Characteristics
New Participants

This table reports pooled regressions of a new participant's value loading on socioeconomic characteristics and year, industry, and county fixed effects. We conduct the estimation on households that enter the stock market between 1999 to 2007 in the representative sample defined in Section II.D of this Internet Appendix. All variables are measured in the year of entry and are fully described in Table A.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.015	2.25	0.106	6.82	0.014	3.78
Log residential real estate	-0.002	-1.46	-0.001	-0.43	-0.001	-0.99
Log commercial real estate	0.000	0.13	0.009	2.27	0.000	0.39
Leverage ratio	0.015	4.98	0.037	3.79	0.000	-0.22
Human Capital and Income Risk						
Log human capital	-0.036	-1.49	-0.059	-1.26	-0.005	-0.38
Log income	-0.048	-2.12	-0.041	-0.87	-0.018	-1.95
Self-employment dummy	-0.189	-4.51	-0.243	-3.43	0.001	0.08
Unemployment dummy	-0.029	-1.42	-0.126	-2.20	0.012	1.10
Conditional income volatility	-0.328	-5.99	-0.253	-2.21	-0.065	-2.11
Demographic Characteristics						
Age	0.001	2.08	0.007	4.38	0.000	1.08
Male household head dummy	-0.109	-7.88	-0.126	-3.57	-0.020	-2.37
High school dummy	0.005	0.30	0.021	0.49	0.007	0.74
Post-high school dummy	-0.058	-3.72	-0.089	-2.46	-0.012	-1.33
Economics education dummy	-0.036	-1.87	0.000	0.00	-0.016	-1.33
Immigration dummy	-0.043	-2.31	-0.061	-1.37	0.017	1.64
Family size	0.030	5.07	0.010	0.69	0.006	1.88
Adjusted R^2	2.06%		3.73%		0.44%	
Number of observations	13,927		4,779		10,472	

Table IA.17
Full Version of Table VIII, Panel B
Income Exposure to Aggregate Income Shocks

This table reports the full version of Table VIII, Panel B, in the main text. Income exposures are based on measures of per-capita income growth from the industries in which the adults of the household work. We construct these estimates directly from the micro-level data of the entire Swedish population, and we define aggregate income shocks as the total per-capita income growth rates across all industries. Other variables are described in Table A of the main text. The regressions are based on the representative panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All regressions include the standard characteristics, year, industry, and county fixed effects. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.018	12.59	0.050	15.98	0.012	14.47
Log residential real estate	0.001	2.16	0.003	4.66	0.000	0.50
Log commercial real estate	0.001	3.49	0.007	11.61	0.000	0.30
Leverage ratio	0.001	0.44	-0.007	-1.63	-0.001	-0.70
Human Capital and Income Risk						
Log human capital	-0.059	-9.80	-0.110	-9.20	-0.026	-7.50
Log income	-0.040	-8.86	-0.038	-4.29	-0.025	-9.41
Self-employment dummy	-0.028	-3.36	-0.031	-2.08	-0.006	-1.28
Unemployment dummy	-0.014	-3.19	-0.013	-1.20	-0.005	-1.64
Conditional income volatility	-0.342	-20.45	-0.330	-10.30	-0.111	-12.23
Loading of sectoral income on aggregate income	-0.205	-10.05	-0.200	-3.86	-0.077	-5.54
Demographic Characteristics						
Age	0.002	11.89	0.008	19.73	0.000	2.61
Male household head dummy	-0.065	-18.87	-0.110	-13.58	-0.014	-6.14
High school dummy	-0.013	-3.22	-0.032	-3.12	-0.006	-2.01
Post-high school dummy	-0.014	-4.07	0.019	2.34	-0.014	-6.41
Economics education dummy	-0.027	-5.95	-0.010	-1.01	-0.014	-4.74
Immigration dummy	-0.063	-10.47	-0.131	-9.80	-0.004	-1.07
Family size	0.035	24.03	0.024	7.10	0.016	18.39
Adjusted R^2	2.20%		3.61%		0.89%	
Number of observations	569,117		320,078		506,919	

Table IA.18
Total and Idiosyncratic Household Volatility

This table documents the statistical properties of labor income innovations in the household panel. As in Section II.F, we consider that labor income is of the form $\log(L_{h,t}) = a_h + b' x_{h,t} + \theta_{h,t} + \varepsilon_{h,t}$, where a_h is a household fixed effect, $x_{h,t}$ is a deterministic vector of characteristics, $\theta_{h,t}$ is a persistent component, and $\varepsilon_{h,t}$ is a transitory component. We also assume that the persistent component follows a first-order autoregressive process with persistence parameter ρ_h, so that $\theta_{h,t} = \rho_h \theta_{h,t-1} + \xi_{h,t}$. From the perspective of the agent, the innovation in next-period labor income is therefore $\eta_{h,t} = \xi_{h,t} + \varepsilon_{h,t}$. Column (1) reports the average standard deviation of the total innovation $\eta_{h,t}$ and column (2) the average persistence parameter ρ_h. We next regress the stochastic component on the Fama-French-Carhart factors, $\eta_{h,t} = \lambda'_{h,t} f_t + \omega_{h,t}$, and report in column (3) the average idiosyncratic share, $Var(\omega_{h,t})/Var(\eta_{h,t})$. The next set of columns consider separately the persistent and transitory shocks. Column (4) reports the average volatility of the persistent shock $\xi_{h,t}$, and column (5) the idiosyncratic share from the regression of the persistent shock $\xi_{h,t}$ on the factors. Similarly, column (6) reports the average volatility of the transitory shock $\varepsilon_{h,t}$, and column (7) the idiosyncratic share from the regression of the transitory shock on the factors. The computations are based on the fixed random sample of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix.

	Total			Persistent Component		Transitory Component	
	Total Volatility (1)	Persistence Parameter (2)	Idiosyncratic Share (3)	Total Volatility (4)	Idiosyncratic Share (5)	Total Volatility (6)	Idiosyncratic Share (7)
Active Households							
- Cross-sectional average	16.3%	0.47	81.0%	6.4%	81.0%	13.5%	82.9%
- Cross-sectional standard deviation	9.9%	0.41	13.8%	15.9%	8.4%	5.0%	13.8%
Retired Households							
- Cross-sectional average	11.8%	0.66	78.7%	6.1%	78.7%	10.1%	78.4%
- Cross-sectional standard deviation	9.4%	0.35	16.6%	12.1%	7.6%	5.1%	16.6%

Table IA.19
Panel Regression of the Value Loading on Characteristics
Controlling for Systematic and Idiosyncratic Labor Income Risk

This table reports pooled regressions of the value loading on the systematic and idiosyncratic exposure of households' income risk to aggregate income shocks, where the measure of income risk is directly computed from the industries where the adults of the household work. We define aggregate income shocks as the total per-capita income growth rates across all industries. All regressions include the standard characteristics, year, industry, and county fixed effects, and we also control for the level of idiosyncratic household income risk. The value loading is computed at the level of the risky portfolio in column (1), the stock portfolio in column (2), and the fund portfolio in column (3). The computations are based on the representative panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.017	12.39	0.050	15.91	0.012	14.40
Log residential real estate	0.001	2.10	0.003	4.63	0.000	0.50
Log commercial real estate	0.001	3.31	0.007	11.56	0.000	0.26
Leverage ratio	0.001	0.38	-0.007	-1.65	-0.001	-0.68
Human Capital and Income Risk						
Log human capital	-0.059	-9.86	-0.110	-9.21	-0.027	-7.51
Log income	-0.040	-8.68	-0.037	-4.24	-0.025	-9.37
Self-employment dummy	-0.030	-3.64	-0.033	-2.21	-0.006	-1.33
Unemployment dummy	-0.014	-3.29	-0.013	-1.23	-0.005	-1.64
Idiosyncratic income volatility	-0.320	-19.98	-0.314	-10.09	-0.109	-12.46
Loading of sectoral income on aggregate income	-0.207	-10.15	-0.201	-3.88	-0.077	-5.54
Demographic Characteristics						
Age	0.002	11.20	0.008	19.45	0.000	2.25
Male household head dummy	-0.065	-18.87	-0.110	-13.56	-0.014	-6.14
High school dummy	-0.014	-3.24	-0.032	-3.11	-0.006	-2.02
Post-high school dummy	-0.014	-4.05	0.019	2.36	-0.014	-6.40
Economics education dummy	-0.027	-5.95	-0.010	-1.01	-0.014	-4.74
Immigration dummy	-0.064	-10.54	-0.132	-9.84	-0.004	-1.06
Family size	0.035	23.83	0.023	7.01	0.016	18.29
Adjusted R^2	2.16%		3.60%		0.90%	
Number of observations	569,117		320,078		506,919	

Table IA.20
Panel Regression of the Value Loading on Characteristics
Alternative Specification of the Sectoral Exposure to Aggregate Income

This table reports pooled regressions of the value loading on the exposure of *unexpected* income to aggregate income shocks, where the measure of income risk is directly computed from the industries where the adults of the household work. We define aggregate income shocks as the average unexpected component of individual income across all industries. All regressions include the standard characteristics, and year, industry, and county fixed effects. The value loading is computed at the level of the risky portfolio in column (1), the stock portfolio in column (2), and the fund portfolio in column (3). The computations are based on the representative panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.017	12.53	0.050	15.95	0.012	14.44
Log residential real estate	0.001	2.21	0.003	4.68	0.000	0.54
Log commercial real estate	0.001	3.65	0.007	11.71	0.000	0.39
Leverage ratio	0.001	0.46	-0.007	-1.64	-0.001	-0.68
Human Capital and Income Risk						
Log human capital	-0.059	-9.83	-0.110	-9.22	-0.027	-7.53
Log income	-0.041	-9.09	-0.039	-4.40	-0.025	-9.58
Self-employment dummy	-0.028	-3.37	-0.031	-2.08	-0.006	-1.28
Unemployment dummy	-0.014	-3.16	-0.013	-1.17	-0.005	-1.63
Conditional income volatility	-0.345	-20.57	-0.333	-10.39	-0.112	-12.29
Loading of sectoral income on aggregate income	-0.145	-6.20	-0.115	-1.89	-0.068	-4.28
Demographic Characteristics						
Age	0.002	12.28	0.008	19.94	0.000	2.82
Male household head dummy	-0.063	-18.34	-0.107	-13.32	-0.013	-5.87
High school dummy	-0.013	-3.17	-0.032	-3.10	-0.005	-1.98
Post-high school dummy	-0.015	-4.20	0.019	2.29	-0.014	-6.49
Economics education dummy	-0.027	-6.01	-0.011	-1.03	-0.014	-4.78
Immigration dummy	-0.064	-10.55	-0.132	-9.84	-0.004	-1.13
Family size	0.036	24.77	0.025	7.44	0.017	18.84
Adjusted R^2	2.17%		3.60%		0.89%	
Number of observations	569,117		320,078		506,919	

Table IA.21
Panel Regression of the Value Loading on Characteristics
Controlling for the Exposure of Labor Income to HML

This table reports pooled regressions of the portfolio value loading on (i) the loading of labor income on the lagged HML factor, (ii) the standard financial and demographic characteristics, and (iii) year, industry, and county fixed effects. The loading of labor income on HML is measured by the loadings of industries in which the adults of the household are employed. The portfolio value loading is computed at the level of the risky portfolio in column (1), the stock portfolio in column (2), and the fund portfolio in column (3). The computations are based on the representative panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.017	12.47	0.050	15.93	0.012	14.40
Log residential real estate	0.001	2.16	0.003	4.66	0.000	0.51
Log commercial real estate	0.001	3.71	0.007	11.68	0.000	0.45
Leverage ratio	0.001	0.43	-0.007	-1.65	-0.001	-0.70
Human Capital and Income Risk						
Log human capital	-0.059	-9.85	-0.110	-9.17	-0.027	-7.55
Log income	-0.041	-9.05	-0.039	-4.44	-0.025	-9.52
Self-employment dummy	-0.028	-3.36	-0.031	-2.08	-0.006	-1.28
Unemployment dummy	-0.014	-3.19	-0.013	-1.17	-0.005	-1.64
Conditional income volatility	-0.347	-20.71	-0.337	-10.51	-0.112	-12.38
Loading of sectoral income on HML	-0.413	-3.74	0.262	0.91	-0.247	-3.35
Demographic Characteristics						
Age	0.002	12.29	0.009	20.06	0.000	2.79
Male household head dummy	-0.063	-18.09	-0.105	-12.97	-0.013	-5.85
High school dummy	-0.013	-3.21	-0.032	-3.09	-0.006	-2.02
Post-high school dummy	-0.014	-4.15	0.019	2.31	-0.014	-6.46
Economics education dummy	-0.027	-6.03	-0.011	-1.05	-0.014	-4.78
Immigration dummy	-0.063	-10.51	-0.132	-9.83	-0.004	-1.10
Family size	0.036	24.74	0.025	7.60	0.017	18.78
Adjusted R^2	2.15%		3.60%		0.88%	
Number of observations	569,117		320,078		506,919	

Table IA.22

Value Loadings of Households Sorted by Age and Industry

Equal-Weighted Average: Stock Portfolio and Reverse Sort

Panel A reports the average stock portfolio value loading of households sorted by age and industry sensitivity in 2003. For each cohort, the first three columns consider households with industry sensitivities in the bottom 10%, 25%, and 50%, the next three columns consider households with industry sensitivities in the top 50%, 25%, and 10%, and the last column reports the value spread between households in the bottom and top halves of industry sensitivity. The last row reports the amplitude of the value ladder in each industry sensitivity bucket. In Panel B, we sort households by the value loading of the risky or stock portfolio and report the average labor income sensitivity in each portfolio bucket. In both panels, the loadings of all households are equally-weighted and demeaned by the 2003 average.

Panel A: Stock Portfolio

	Least Cyclical Industries			Most Cyclical Industries			Spread
	Bottom			Top			(Bottom 50% -
	10%	25%	50%	50%	25%	10%	Top 50%)
Age:							
30	-0.18	-0.17	-0.18	-0.30	-0.31	-0.28	0.12
40	0.02	-0.04	-0.07	-0.10	-0.16	-0.12	0.04
50	0.06	0.06	0.08	0.07	0.06	0.03	0.01
60	0.30	0.24	0.22	0.19	0.18	0.20	0.03
Spread (Age 60 - Age 30)	0.48	0.41	0.40	0.50	0.49	0.48	

Panel B: Reverse Sort

	Least Value Portfolios			Most Value Portfolios			Spread
	Bottom			Top			(Bottom 50% -
	10%	25%	50%	50%	25%	10%	Top 50%)
Risky Portfolio	0.02	0.02	0.01	-0.01	-0.01	0.00	-0.02
Stock Portfolio	0.02	0.02	0.01	0.00	0.00	0.01	-0.01

Table IA.23
Value Loadings of Households Sorted by Age and Industry
Value-Weighted Averages

This table reports the average value loading of the risky portfolios (Panel A) and stock portfolios (Panel B) held by households sorted by age and industry sensitivity in 2003. In both panels, the value loadings are weighted by household financial wealth and are demeaned by the 2003 average. The first three columns consider households with industry sensitivities in the bottom 10%, 25%, and 50%, the next set of three columns consider households with industry sensitivities in the top 50%, 25%, and 10%, and the last column reports the value spread between households in the bottom and top halves of industry sensitivity. The last row reports the amplitude of the value ladder in each industry sensitivity bucket.

Panel A: Risky Portfolio

	Least Cyclical Industries			Most Cyclical Industries			Spread
	Bottom			Top			(Bottom 50% -
	10%	25%	50%	50%	25%	10%	Top 50%)
Age:							
30	-0.07	-0.05	-0.05	-0.12	-0.15	-0.16	0.07
40	0.02	0.00	-0.01	-0.08	-0.12	-0.08	0.07
50	0.04	0.03	0.03	0.01	0.00	-0.08	0.02
60	0.11	0.07	0.08	0.08	0.07	0.06	0.00
Spread (Age 60 - Age 30)	0.18	0.13	0.13	0.20	0.22	0.22	

Panel B: Stock Portfolio

	Least Cyclical Industries			Most Cyclical Industries			Spread
	Bottom			Top			(Bottom 50% -
	10%	25%	50%	50%	25%	10%	Top 50%)
Age:							
30	-0.26	-0.16	-0.18	-0.29	-0.31	-0.38	0.12
40	-0.01	-0.04	-0.09	-0.13	-0.17	-0.13	0.04
50	0.04	0.01	0.02	0.04	0.04	-0.05	-0.01
60	0.22	0.13	0.14	0.17	0.17	0.16	-0.03
Spread (Age 60 - Age 30)	0.47	0.30	0.32	0.46	0.48	0.54	

Table IA.24

Average Characteristics of Households Sorted by Immigration or Employment Type

Financial and Demographic Characteristics

This table reports the average financial and demographic characteristics of households sorted by the head's immigration status (first set of columns) and employment type (second set of columns). The averages are computed for year 2003 on the fixed random sample of households defined in Section II.D of this Internet Appendix. All variables are described in Table A of the main text.

	Immigration Status		Form of Employment	
	Immigrants	Nonimmigrants	Self-Employed	Employee
Financial Characteristics				
Financial wealth ($)	38,042	49,805	72,665	47,809
Residential real estate wealth ($)	108,596	139,630	188,872	134,847
Commercial real estate wealth ($)	5,056	20,866	105,399	15,832
Leverage ratio	0.82	0.65	0.56	0.67
Human Capital and Income Risk				
Human capital ($)	905,727	960,098	724,266	965,787
Income ($)	43,685	46,405	40,131	46,449
Unemployment dummy	0.11	0.07	0.05	0.08
Conditional income volatility	0.19	0.16	0.29	0.16
Demographic Characteristics				
Age	46.99	46.20	49.66	46.12
Male household head dummy	0.56	0.65	0.76	0.64
High school dummy	0.80	0.85	0.73	0.85
Post-high school dummy	0.36	0.37	0.22	0.37
Economics education dummy	0.09	0.12	0.07	0.12
Family size	2.70	2.52	2.47	2.54
Number of observations	5,822	65,817	2,998	2,998

Table IA.25
Average Characteristics of Households Sorted by Immigration or Employment Type
Portfolio Characteristics

This table reports the average portfolio characteristics of households sorted by the head's immigration status (first set of columns) and employment type (second set of columns). The averages are computed for year 2003 on the fixed random sample of households defined in Section II.D of this Internet Appendix. All variables are described in Table A of the main text.

	Immigration Status		Form of Employment	
	Immigrants	Nonimmigrants	Self-Employed	Employee
Portfolio Components				
Risky share	0.37	0.40	0.37	0.40
Share of direct stockholdings in risky portfolio	0.34	0.28	0.40	0.28
Share of popular stocks	0.74	0.71	0.74	0.71
Share of professionally close stocks	0.13	0.17	0.15	0.16
Number of stocks	2.14	2.63	3.32	2.56
Number of funds	3.13	4.20	3.80	4.13
Standard Deviation				
Risky portfolio	0.24	0.22	0.24	0.22
Complete portfolio	0.09	0.09	0.09	0.09
Value Loading				
Risky portfolio	-0.37	-0.29	-0.32	-0.30
Stock portfolio	-0.71	-0.56	-0.51	-0.58
Fund portfolio	-0.20	-0.20	-0.21	-0.20

Table IA.26
Panel Regression of the Value Loading on Characteristics
Age of Participants and Age of New Entrants

This table reports pooled regressions of the value loading on (i) age dummies for participating households, (ii) age dummies for households that enter risky asset markets during the year, and (iii) all the other standard characteristics, and year, industry, and county fixed effects. Age dummies are cumulative. The computations are based on the fixed random sample of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are discussed in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.016	11.34	0.048	15.57	0.012	14.35
Log residential real estate	0.001	1.91	0.003	4.53	0.000	0.07
Log commercial real estate	0.001	3.88	0.007	12.19	0.000	0.39
Leverage ratio	0.002	1.21	-0.005	-1.07	-0.001	-0.83
Human Capital and Income Risk						
Log human capital	-0.059	-10.52	-0.116	-10.51	-0.025	-7.55
Log income	-0.041	-9.88	-0.037	-4.79	-0.026	-11.42
Self-employment dummy	-0.033	-4.29	-0.038	-2.70	-0.011	-2.45
Unemployment dummy	-0.016	-3.68	-0.021	-1.96	-0.004	-1.60
Conditional income volatility	-0.344	-21.18	-0.331	-10.73	-0.113	-12.83
Demographic Characteristics						
Male household head dummy	0.016	9.30	-0.062	-18.29	-0.104	-13.23
High school dummy	0.023	11.12	-0.014	-3.50	-0.036	-3.64
Post-high school dummy	0.033	19.51	-0.015	-4.35	0.016	2.04
Economics education dummy	0.011	4.64	-0.026	-5.85	-0.011	-1.07
Immigration dummy	-0.005	-2.04	-0.064	-10.74	-0.131	-10.08
Family size	-0.009	-13.19	0.037	24.25	0.023	6.84

(Continued)

Table IA.26 – *Continued*

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Age Dummies						
30 and above	0.003	0.45	0.052	3.29	0.000	-0.07
35 and above	0.005	1.23	0.047	4.28	0.000	-0.05
40 and above	0.010	2.87	0.039	4.14	0.005	2.11
45 and above	0.012	3.55	0.058	6.62	0.002	0.91
50 and above	0.015	4.49	0.040	5.17	0.000	0.15
55 and above	0.019	5.98	0.037	5.60	0.002	1.07
60 and above	0.011	3.49	0.022	3.36	0.003	1.59
65 and above	0.019	3.52	0.021	1.92	0.006	1.66
70 and above	0.058	5.62	0.139	6.47	0.023	3.46
New Entrant Dummies						
New entrant aged 30+	-0.091	-5.99	-0.252	-6.14	-0.007	-0.83
New entrant aged 35+	-0.007	-0.35	-0.007	-0.12	-0.008	-0.62
New entrant aged 40+	-0.032	-1.42	-0.090	-1.48	0.004	0.29
New entrant aged 45+	-0.007	-0.28	-0.025	-0.41	0.000	-0.02
New entrant aged 50+	0.001	0.07	0.037	0.69	0.005	0.40
New entrant aged 55+	-0.020	-0.93	-0.029	-0.61	-0.009	-0.65
New entrant aged 60+	-0.001	-0.04	-0.068	-1.23	-0.002	-0.12
New entrant aged 65+	-0.119	-2.96	-0.028	-0.39	-0.010	-0.43
New entrant aged 70+	-0.010	-0.45	-0.013	-0.26	0.032	2.58
Adjusted R^2	2.53%		4.12%		0.96%	
Number of observations	589,561		331,693		523,798	

Table IA.27
Panel Regression of the Value Loading on Characteristics
Subsample of Households Headed by Men

This table reports pooled regressions of the value loading on household characteristics and year, industry, and county fixed effects, estimated on households headed by men in the 1999 to 2007 sample defined in Section II.D of this Internet Appendix. The value loading is computed at the level of the risky portfolio in column (1), stock portfolio in column (2), and fund portfolio in column (3). All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.016	8.72	0.052	13.63	0.010	9.71
Log residential real estate	0.000	0.41	0.002	2.23	0.000	-0.93
Log commercial real estate	0.001	1.81	0.006	7.88	0.000	1.03
Leverage ratio	-0.001	-0.34	-0.008	-1.53	-0.002	-1.73
Human Capital and Income Risk						
Log human capital	-0.065	-8.62	-0.125	-9.26	-0.023	-5.50
Log income	-0.046	-8.80	-0.048	-5.19	-0.028	-9.77
Self-employment dummy	-0.036	-4.05	-0.045	-2.84	-0.009	-1.82
Unemployment dummy	-0.021	-3.27	-0.021	-1.56	-0.009	-2.31
Conditional income volatility	-0.372	-17.04	-0.351	-9.33	-0.102	-9.05
Demographic Characteristics						
Age	0.003	14.72	0.010	21.14	0.001	6.09
High school dummy	-0.015	-2.98	-0.038	-3.26	-0.005	-1.46
Post-high school dummy	-0.022	-4.56	0.022	2.16	-0.019	-6.62
Economics education dummy	-0.027	-4.13	-0.003	-0.23	-0.014	-3.31
Immigration dummy	-0.073	-8.95	-0.128	-7.77	-0.007	-1.46
Family size	0.046	24.98	0.036	9.19	0.020	18.40
Adjusted R^2	2.58%		3.97%		1.04%	
Number of observations	387,707		232,428		341,130	

Table IA.28
Panel Regression of the Value Loading on Characteristics
Entrepreneur Subsample

This table reports pooled regressions of the value loading on household characteristics and year, industry, and county fixed effects, estimated on households with self-employed heads in the 1999 to 2007 sample defined in Section II.D of this Internet Appendix. The value loading is computed at the level of the risky portfolio in column (1), stock portfolio in column (2), and fund portfolio in column (3). All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.019	5.44	0.041	5.68	0.013	6.17
Log residential real estate	0.002	2.33	0.003	1.73	0.000	0.51
Log commercial real estate	0.002	2.75	0.011	8.64	0.000	-0.69
Leverage ratio	0.007	1.92	0.005	0.43	0.002	1.02
Human Capital and Income Risk						
Log human capital	-0.029	-2.40	-0.090	-3.55	-0.012	-1.63
Log income	-0.045	-4.35	-0.045	-2.39	-0.030	-5.31
Unemployment dummy	-0.010	-0.93	-0.058	-1.95	-0.001	-0.19
Conditional income volatility	-0.284	-8.22	-0.229	-3.46	-0.111	-5.58
Demographic Characteristics						
Age	0.004	8.39	0.010	10.82	0.001	4.58
Male household head dummy	-0.072	-7.99	-0.125	-6.25	-0.010	-1.85
High school dummy	0.006	0.58	0.012	0.52	-0.006	-0.93
Post-high school dummy	-0.035	-4.09	-0.035	-1.73	-0.023	-4.22
Economics education dummy	-0.063	-4.00	-0.081	-2.45	-0.016	-1.85
Immigration dummy	-0.039	-2.48	-0.069	-2.11	0.003	0.35
Family size	0.023	6.47	0.016	2.02	0.015	6.78
Adjusted R^2	2.33%		4.61%		1.12%	
Number of observations	74,361		43,725		64,770	

Table IA.29
Panel Regression of the Value Loading on Characteristics
Immigrant Subsample

This table reports pooled regressions of the value loading on household characteristics and year, industry, and county fixed effects, estimated on households with immigrant heads in the 1999 to 2007 sample defined in Section II.D of this Internet Appendix. The value loading is computed at the level of the risky portfolio in column (1), stock portfolio in column (2), and fund portfolio in column (3). All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.008	1.94	0.049	5.33	0.007	2.70
Log residential real estate	0.002	2.79	0.009	4.95	0.000	0.43
Log commercial real estate	0.002	1.96	0.008	3.60	0.001	1.57
Leverage ratio	0.011	2.82	0.013	1.12	0.001	0.26
Human Capital and Income Risk						
Log human capital	0.013	0.78	-0.015	-0.51	-0.007	-0.75
Log income	-0.059	-4.72	-0.067	-3.06	-0.024	-3.75
Self-employment dummy	-0.035	-1.77	-0.006	-0.20	-0.011	-1.03
Unemployment dummy	-0.016	-1.30	-0.034	-1.35	-0.003	-0.47
Conditional income volatility	-0.428	-9.74	-0.448	-5.88	-0.085	-3.91
Demographic Characteristics						
Age	0.004	7.59	0.011	10.09	0.001	1.90
Male household head dummy	-0.073	-6.32	-0.090	-3.64	-0.018	-2.64
High school dummy	-0.001	-0.07	-0.021	-0.79	0.006	0.83
Post-high school dummy	-0.055	-4.76	-0.046	-1.86	-0.026	-3.73
Economics education dummy	-0.023	-1.27	0.045	1.30	-0.015	-1.48
Family size	0.014	2.90	-0.013	-1.38	0.015	6.06
Adjusted R^2	2.33%		5.02%		0.70%	
Number of observations	64,654		36,581		54,325	

Table IA.30
Panel Regression of the Value Loading on Characteristics
Portfolios of Popular and Professionally Close Stocks

This table reports pooled regressions of the value loading of household subportfolios on household characteristics in the presence of year, industry, and county fixed effects. Every subportfolio in the table is a subset of the stock portfolio. We consider the portfolio of popular stocks in column (1), the portfolio of stocks other than popular stocks in column (2), the portfolio of professionally close stocks in column (3), and the portfolio of stocks other than professionally close stocks in column (4). The computations are based on the representative panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading of Stock Subportfolio							
	Popular (1)		Not Popular (2)		Profess. Close (3)		Not Profess. Close (4)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics								
Log financial wealth	0.019	8.39	0.144	22.01	0.073	12.87	0.053	16.48
Log residential real estate	0.002	4.08	0.004	2.45	0.003	1.90	0.004	5.01
Log commercial real estate	0.007	15.30	0.002	1.81	0.003	2.29	0.007	11.70
Leverage ratio	0.005	1.79	-0.029	-3.01	-0.033	-3.70	-0.002	-0.49
Human capital and Income Risk								
Log human capital	-0.085	-10.53	-0.101	-4.38	-0.109	-5.20	-0.115	-9.47
Log income	-0.021	-3.86	-0.077	-4.89	-0.040	-2.61	-0.034	-3.85
Self-employment dummy	-0.020	-1.95	-0.139	-4.29	-0.098	-3.52	-0.023	-1.52
Unemployment dummy	-0.009	-1.25	-0.069	-2.84	-0.020	-0.97	-0.017	-1.45
Conditional income volatility	-0.047	-2.21	-0.704	-11.01	-0.335	-6.35	-0.312	-9.54
Demographic Characteristics								
Age	0.005	17.20	0.016	19.21	0.008	10.33	0.008	17.80
Male household head dummy	-0.061	-10.21	-0.169	-9.74	-0.080	-5.49	-0.113	-13.77
High school dummy	-0.029	-3.79	-0.032	-1.33	-0.035	-1.85	-0.025	-2.37
Post-high school dummy	0.017	2.81	0.061	3.55	0.032	2.17	0.022	2.65
Economics education dummy	-0.010	-1.28	-0.004	-0.18	0.028	1.70	-0.021	-1.95
Immigration dummy	-0.086	-9.20	-0.321	-10.59	-0.148	-5.86	-0.126	-9.09
Family size	0.017	7.14	0.021	3.03	0.015	2.54	0.022	6.58
Adjusted R^2	2.95%		5.35%		3.08%		3.33%	
Number of observations	287,574		188,449		98,916		288,409	

Table IA.31
Panel Regression of the Value Loading on Characteristics
Value Tilt Across Employment Sectors

This table reports pooled regressions of the risky portfolio value loading on household characteristics and year, industry, and county fixed effects, estimated on subsets of households in specific employment sectors: (1) the 15 sectors in which employees owning a single stock have the strongest growth tilt, (2) the 15 sectors in which employees owning a single stock have the strongest value tilt, (3) the 15 sectors in which employee incomes have the strongest growth tilts, (4) the 15 sectors in which employee incomes have the strongest value tilts, (5) the 15 sectors in which employees have the lowest share of professionally close stocks, (6) the 15 sectors with the highest shares of professionally close stocks, and (7) public sector employees. The subsamples are obtained from the fixed random panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading of Risky Portfolio													
	Industries Sorted by Portfolio Risk				Industries Sorted by Income Risk				Industries Sorted by Share of Prof. Close Stocks				Public Sector	
	Most 15 Growth (1)		Most 15 Value (2)		Most 15 Growth (3)		Most 15 Value (4)		Bottom 15 (5)		Top 15 (6)		(7)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics														
Log financial wealth	0.030	8.76	0.010	4.79	0.024	10.30	0.006	1.99	0.012	5.70	0.032	8.27	0.024	12.27
Log residential real estate	0.001	1.47	0.001	2.03	0.001	1.46	0.000	0.61	0.001	2.34	0.001	1.26	0.000	0.82
Log commercial real estate	0.002	2.13	0.001	1.48	0.001	2.88	0.000	0.43	0.001	1.86	0.000	0.02	0.001	3.45
Leverage ratio	-0.003	-0.82	0.003	1.61	0.000	-0.03	-0.002	-0.56	0.005	2.47	-0.004	-1.01	-0.001	-0.27
Human Capital and Income Risk														
Log human capital	-0.049	-3.10	`	-5.72	-0.042	-4.36	-0.053	-4.01	-0.066	-7.38	-0.055	-3.45	-0.046	-5.67
Log income	-0.062	-5.55	-0.031	-4.26	-0.053	-6.64	-0.033	-3.08	-0.034	-4.54	-0.048	-4.10	-0.044	-7.30
Self-employment dummy	-0.042	-2.21	0.007	0.59	-0.022	-0.79	-0.016	-1.07	-0.011	-0.91	-0.057	-3.13	-0.081	-4.22
Unemployment dummy	-0.014	-1.33	-0.020	-3.15	-0.019	-2.77	0.001	0.07	-0.014	-2.34	-0.022	-1.87	-0.020	-3.03
Conditional income volatility	-0.414	-11.15	-0.313	-11.95	-0.334	-11.92	-0.324	-10.04	-0.298	-12.32	-0.401	-9.89	-0.358	-14.94
Demographic Characteristics														
Age	0.003	6.06	0.002	5.90	0.002	5.86	0.003	7.53	0.002	7.73	0.003	6.02	0.002	8.38
Male household head dummy	-0.084	-11.27	-0.060	-10.68	-0.064	-12.13	-0.060	-7.43	-0.059	-10.92	-0.079	-8.91	-0.061	-12.95
High school dummy	-0.017	-1.48	-0.021	-3.40	-0.011	-1.31	-0.018	-2.53	-0.010	-1.69	-0.017	-1.24	-0.013	-1.97
Post-high school dummy	-0.010	-1.26	-0.016	-2.94	-0.016	-2.99	-0.026	-3.08	-0.019	-3.75	-0.010	-1.08	-0.019	-3.99
Economics education dummy	-0.024	-3.03	-0.040	-4.57	-0.028	-3.54	-0.032	-3.00	-0.030	-3.63	-0.020	-1.93	-0.023	-3.41
Immigration dummy	-0.084	-5.64	-0.058	-6.36	-0.066	-7.14	-0.035	-2.90	-0.049	-5.89	-0.060	-3.14	-0.079	-9.71
Family size	0.047	13.52	0.028	12.66	0.033	13.88	0.038	13.16	0.034	15.98	0.044	11.35	0.029	13.49
Adjusted R^2	3.00%		1.70%		2.07%		1.86%		1.74%		2.94%		2.56%	
Number of observations	115,638		179,827		195,267		135,772		228,194		86,697		237,906	

Table IA.32

Panel Regression of the Value Loading on Characteristics

Households with Extreme Shares of Professionally Close Stocks

This table reports pooled regressions of the value loading on household characteristics and year, industry, and county fixed effects, estimated on households that invest either 100% or 0% of their stock portfolios in professionally close stocks. The subsamples are obtained from the fixed random panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. We compute the value loading at the level of the risky portfolio in columns (1) and (2), the stock portfolio in columns (3) and (4), and fund portfolio in columns (5) and (6). All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading											
	Risky Portfolio				Stock Portfolio				Fund Portfolio			
	100% Prof. Close (1)		0% Prof. Close (2)		100% Prof. Close (3)		0% Prof. Close (4)		100% Prof. Close (5)		0% Prof. Close (6)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics												
Log financial wealth	0.062	6.93	0.039	14.08	0.029	2.54	0.032	8.53	0.021	4.81	0.016	11.26
Log residential real estate	0.002	1.12	0.002	3.33	0.004	1.55	0.003	3.90	-0.002	-2.96	0.000	-0.47
Log commercial real estate	0.002	1.01	0.003	7.99	0.007	2.53	0.009	12.26	0.002	1.84	0.001	2.34
Leverage ratio	-0.019	-2.01	-0.007	-1.86	-0.025	-1.90	-0.003	-0.50	-0.010	-1.94	-0.006	-2.63
Human Capital and Income Risk												
Log human capital	-0.109	-3.17	-0.065	-6.40	-0.190	-3.86	-0.108	-7.50	-0.017	-1.14	-0.029	-5.61
Log income	-0.020	-0.80	-0.046	-6.02	0.028	0.80	-0.047	-4.49	-0.015	-1.40	-0.024	-6.27
Self-employment dummy	-0.125	-2.76	-0.004	-0.29	-0.125	-2.09	-0.010	-0.56	-0.032	-1.53	0.007	1.05
Unemployment dummy	-0.024	-0.90	-0.037	-4.07	0.025	0.69	-0.024	-1.85	-0.011	-0.78	-0.017	-3.52
Conditional income volatility	-0.478	-5.95	-0.400	-13.72	-0.388	-3.49	-0.319	-8.32	-0.090	-2.67	-0.117	-8.35
Demographic Characteristics												
Age	0.004	3.58	0.005	15.39	0.008	4.86	0.009	18.94	0.001	1.98	0.001	4.83
Male household head dummy	-0.098	-5.18	-0.088	-14.22	-0.082	-2.87	-0.115	-12.01	-0.037	-3.96	-0.015	-4.45
High school dummy	-0.056	-2.20	-0.021	-2.66	-0.095	-2.68	-0.029	-2.38	0.001	0.11	-0.008	-1.91
Post-high school dummy	0.019	0.98	-0.002	-0.32	0.007	0.23	0.012	1.24	-0.019	-2.00	-0.011	-3.26
Economics education dummy	-0.005	-0.24	-0.033	-3.95	0.029	0.86	-0.041	-3.06	0.001	0.08	-0.013	-2.85
Immigration dummy	-0.108	-3.10	-0.122	-11.02	-0.067	-1.42	-0.143	-9.09	-0.022	-1.24	-0.023	-3.60
Family size	0.056	6.96	0.042	16.19	0.021	1.67	0.032	8.11	0.018	4.57	0.018	12.86
Adjusted R^2	4.53%		4.01%		3.00%		3.41%		1.81%		1.43%	
Number of observations	25,175		214,668		25,175		214,668		18,713		170,358	

Table IA.33
Panel Regression of the Value Loading on Characteristics
Households with Extreme Shares of Popular Stocks

This table reports pooled regressions of the value loading on household characteristics and year, industry, and county fixed effects, estimated on households that invest either 100% or 0% of their stock portfolios in popular stocks. The subsamples are obtained from the fixed random panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. We compute the value loading at the level of the risky portfolio in columns (1) and (2), the stock portfolio in columns (3) and (4), and fund portfolio in columns (5) and (6). All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading											
	Risky Portfolio				Stock Portfolio				Fund Portfolio			
	100% Popular (1)		0% Popular (2)		100% Popular (3)		0% Popular (4)		100% Popular (5)		0% Popular (6)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics												
Log financial wealth	0.020	8.22	0.095	9.01	-0.027	-8.07	0.093	6.73	0.019	10.71	0.022	6.00
Log residential real estate	0.002	2.85	0.003	1.43	0.002	2.90	0.005	1.60	0.000	-1.34	0.000	-0.44
Log commercial real estate	0.004	8.23	0.003	1.81	0.012	16.96	0.008	2.24	0.000	0.56	0.001	1.08
Leverage ratio	0.004	1.24	-0.007	-0.70	0.012	3.40	-0.014	-1.02	-0.006	-2.54	-0.004	-0.82
Human Capital and Income Risk												
Log human capital	-0.061	-6.89	-0.076	-2.02	-0.082	-6.81	-0.192	-3.52	-0.025	-4.10	-0.008	-0.60
Log income	-0.033	-5.07	-0.074	-3.00	-0.044	-5.16	-0.045	-1.31	-0.027	-5.65	-0.026	-2.67
Self-employment dummy	-0.007	-0.61	-0.099	-1.71	-0.010	-0.67	-0.077	-1.06	-0.007	-0.96	-0.014	-0.70
Unemployment dummy	-0.021	-2.82	-0.074	-2.01	-0.009	-0.90	-0.065	-1.30	-0.014	-2.46	-0.005	-0.47
Conditional income volatility	-0.171	-7.23	-1.060	-10.23	-0.056	-1.77	-1.112	-8.20	-0.092	-5.19	-0.097	-3.12
Demographic Characteristics												
Age	0.003	10.03	0.010	7.85	0.006	15.72	0.019	10.40	0.001	4.17	0.001	2.64
Male household head dummy	-0.045	-7.57	-0.199	-8.28	-0.066	-7.40	-0.205	-5.45	-0.010	-2.58	-0.033	-3.95
High school dummy	-0.027	-3.69	0.009	0.28	-0.041	-3.87	-0.023	-0.47	-0.001	-0.21	-0.003	-0.30
Post-high school dummy	-0.001	-0.12	-0.014	-0.59	-0.007	-0.74	0.012	0.32	-0.010	-2.43	-0.027	-3.18
Economics education dummy	-0.036	-4.61	-0.001	-0.04	-0.036	-3.06	-0.001	-0.02	-0.012	-2.17	-0.010	-0.93
Immigration dummy	-0.099	-9.72	-0.226	-5.28	-0.113	-8.39	-0.238	-4.04	-0.023	-3.06	-0.007	-0.52
Family size	0.033	14.14	0.063	6.39	0.031	9.04	0.021	1.37	0.017	9.83	0.019	5.94
Adjusted R^2	3.26%		5.81%		3.88%		4.86%		1.45%		1.57%	
Number of observations	143,244		44,119		143,244		44,119		109,919		32,119	

Table IA.34

Panel Regression of the Value Loading on Characteristics

Portfolios of Stocks Sorted by Dividend Yield, Tax Regime, and Firm Age

This table considers six subportfolios of directly held stocks and reports for each of them the pooled regression of the value loading on household characteristics in the presence of year, industry, and county fixed effects. The subportfolios consist of (1) stocks paying no dividends, (2) stocks with average annual dividend yields above 2%, (3) tax-advantaged O-stocks, (4) taxable A-stocks, (5) companies that have been listed for no more than 10 years, and (6) companies that have been listed for at least 20 years. The regressions include year, industry and county fixed effects, and are estimated on the representative panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A.

	Dependent Variable: Value Loading											
	No-Div. Stocks (1)		High-Div. Stocks (2)		O Stocks (3)		A Stocks (4)		Young Stocks (5)		Old Stocks (6)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics												
Log financial wealth	0.133	13.37	0.027	10.91	0.155	20.87	0.045	16.02	0.146	28.00	0.048	15.02
Log residential real estate	0.004	1.45	0.002	3.88	0.005	2.52	0.003	4.50	0.002	1.94	0.002	3.31
Log commercial real estate	0.002	0.93	0.003	7.30	0.007	4.84	0.007	12.02	0.002	2.35	0.002	3.27
Leverage ratio	-0.058	-0.04	2.007	6.10	-0.001	-4.80	0.000	1.38	-4.194	-5.09	-1.643	-4.02
Human Capital and Income Risk												
Log human capital	-0.092	-2.59	-0.068	-8.00	-0.067	-2.59	-0.102	-10.31	-0.067	-3.81	-0.071	-6.45
Log income	-0.095	-4.24	0.005	0.76	-0.096	-5.14	-0.025	-3.62	-0.043	-3.41	-0.038	-5.03
Self-employment dummy	-0.048	-1.03	-0.019	-1.67	-0.095	-2.66	-0.047	-3.70	-0.023	-0.99	-0.059	-3.95
Unemployment dummy	0.031	0.86	-0.006	-0.65	-0.033	-1.21	-0.019	-1.92	0.003	0.15	-0.031	-2.80
Conditional income volatility	-0.305	-3.33	-0.002	-0.10	-0.635	-9.32	-0.199	-7.42	-0.436	-8.95	-0.225	-7.71
Demographic Characteristics												
Age	0.010	8.09	0.002	7.25	0.014	15.62	0.007	21.03	0.009	13.91	0.007	19.29
Male household head dummy	-0.133	-4.81	-0.044	-6.69	-0.180	-9.32	-0.086	-12.07	-0.106	-8.46	-0.078	-9.51
High school dummy	-0.054	-1.37	-0.007	-0.88	-0.034	-1.27	-0.029	-3.18	-0.009	-0.50	-0.001	-0.06
Post-high school dummy	-0.067	-2.49	0.019	2.77	0.021	1.09	0.029	3.98	0.016	1.19	0.045	5.51
Economics education dummy	0.001	0.02	-0.007	-0.81	0.035	1.45	-0.009	-1.02	0.007	0.46	0.017	1.66
Immigration dummy	0.127	2.98	-0.068	-6.03	-0.355	-10.10	-0.106	-9.53	0.000	0.01	-0.109	-8.79
Family size	0.018	1.68	0.013	5.03	-0.002	-0.31	0.021	7.23	0.006	1.14	0.008	2.52
Adjusted R^2	1.88%		1.05%		5.57%		3.32%		4.37%		3.91%	
Number of observations	110,369		273,442		117,823		315,207		207,099		221,963	

Table IA.35
Panel Regression of the Value Loading on Characteristics
2005-07 Subsample

This table reports pooled regressions of the value loading on household characteristics and year, industry, and county fixed effects. The estimation is identical to our baseline estimation in Table III, but we only retain years 2005, 2006, 2007, following the elimination of the inheritance tax laws in Sweden. The value loading is computed at the level of the risky portfolio in column (1), the stock portfolio in column (2), and the fund portfolio in column (3). The computations are based on the representative panel of households defined in Section II.D of this Internet Appendix. All variables are described in Table A. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.019	9.80	0.078	16.61	0.003	2.55
Log residential real estate	0.000	-0.33	0.003	3.00	-0.001	-4.02
Log commercial real estate	0.000	0.42	0.006	7.61	0.000	-0.76
Leverage ratio	0.005	2.14	-0.001	-0.13	-0.001	-0.83
Human Capital and Income Risk						
Log human capital	-0.061	-7.81	-0.125	-8.00	-0.027	-6.54
Log income	-0.026	-4.65	-0.009	-0.79	-0.014	-4.80
Self-employment dummy	-0.049	-4.61	-0.051	-2.49	-0.007	-1.26
Unemployment dummy	-0.033	-4.44	-0.048	-2.66	-0.006	-1.48
Conditional income volatility	-0.331	-15.02	-0.268	-6.29	-0.087	-7.94
Demographic Characteristics						
Age	0.002	8.44	0.008	14.57	0.001	4.62
Male household head dummy	-0.063	-13.65	-0.110	-10.17	-0.011	-4.19
High school dummy	-0.016	-2.79	-0.042	-2.96	-0.006	-1.69
Post-high school dummy	-0.015	-3.27	0.033	2.96	-0.019	-7.30
Economics education dummy	-0.031	-5.06	-0.010	-0.72	-0.017	-4.66
Immigration dummy	-0.084	-10.18	-0.174	-9.59	0.007	1.83
Family size	0.033	16.42	0.015	3.25	0.013	12.21
Adjusted R^2	2.06%		4.30%		0.82%	
Number of observations	179,890		98,873		160,173	

Table IA.36
Panel Regression of the Value Loading on Characteristics
Controlling for Financial Market Experience and Age

This table reports pooled regressions of the value loading in 2007 on (i) the number of years in the panel when the household participates in risky asset markets, (ii) the earliest value loading in the panel, and (iii) all the other household characteristics and year, industry, and county fixed effects. The computations are based on the representative panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Initial value loading	0.351	35.77	0.470	34.01	0.126	29.09
Experience						
Number of participation years	-0.006	-4.07	-0.015	-2.46	-0.011	-11.42
Financial Characteristics						
Log financial wealth	0.018	7.24	0.075	12.57	0.002	1.29
Log residential real estate wealth	0.000	-0.24	0.003	2.07	-0.001	-4.79
Log commercial real estate wealth	0.001	1.73	0.007	7.11	0.000	0.10
Leverage ratio	0.004	1.23	0.010	0.93	0.000	0.23
Human Capital and Income Risk						
Log human capital	-0.079	-6.96	-0.140	-6.18	-0.021	-3.98
Log income	-0.004	-0.46	0.018	1.00	-0.014	-3.40
Self-employment dummy	-0.052	-3.93	-0.064	-2.45	-0.007	-1.18
Unemployment dummy	-0.026	-2.27	-0.032	-1.13	-0.001	-0.16
Conditional income volatility	-0.172	-6.09	-0.046	-0.83	-0.023	-1.75
Demographic Characteristics						
Age	0.001	1.49	0.005	5.90	0.001	4.13
Male household head dummy	-0.037	-7.36	-0.055	-4.45	-0.003	-0.91
High school dummy	-0.022	-3.50	-0.077	-4.63	-0.003	-0.78
Post-high school dummy	-0.010	-2.02	0.037	3.00	-0.015	-5.27
Economics education dummy	-0.036	-5.04	-0.009	-0.55	-0.019	-4.80
Immigration dummy	-0.073	-7.63	-0.133	-6.17	0.007	1.55
Family size	0.029	11.72	0.005	0.89	0.012	9.17
Adjusted R^2	15.15%		13.25%		6.12%	
Number of observations	50,818		27,701		45,257	

Table IA.37
Panel Regression of the Value Loading on Characteristics
Controlling for Financial Market Experience - No Age Variable

We report regressions of the 2007 value loading on (i) the earliest value loading in the panel, (ii) the number of years in the panel when the household participates in risky asset markets, and (iii) all the other household characteristics, and year, industry, and county fixed effects. This table is a variant of Table IA.36 from which we exclude age to avoid potential collinearity between age and participation years. We conduct the estimation on all 2007 participants from the random panel defined in Section II.D of this Internet Appendix. All variables are described in Table A of the main text.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Initial value loading	0.351	35.80	0.472	34.19	0.126	29.16
Experience						
Number of participation years	-0.006	-3.84	-0.009	-1.57	-0.010	-10.84
Financial Characteristics						
Log financial wealth	0.018	7.35	0.076	12.73	0.002	1.59
Log residential real estate wealth	0.000	0.06	0.004	3.19	-0.001	-4.11
Log commercial real estate wealth	0.001	1.71	0.007	7.01	0.000	0.04
Leverage ratio	0.004	1.21	0.009	0.82	0.000	0.17
Human Capital and Income Risk						
Log human capital	-0.089	-10.95	-0.222	-12.66	-0.035	-8.56
Log income	0.002	0.24	0.068	4.29	-0.005	-1.47
Self-employment dummy	-0.053	-4.02	-0.072	-2.73	-0.009	-1.41
Unemployment dummy	-0.026	-2.28	-0.031	-1.10	-0.001	-0.18
Conditional income volatility	-0.170	-6.02	-0.044	-0.80	-0.021	-1.57
Demographic characteristics						
Male household head dummy	-0.036	-7.30	-0.049	-4.04	-0.001	-0.50
High school dummy	-0.024	-3.76	-0.089	-5.36	-0.005	-1.29
Post-high school dummy	-0.009	-1.81	0.045	3.69	-0.013	-4.71
Economics education dummy	-0.036	-5.03	-0.010	-0.62	-0.019	-4.77
Immigration dummy	-0.073	-7.57	-0.128	-5.91	0.008	1.71
Family size	0.029	11.69	0.002	0.39	0.011	8.90
Adjusted R^2	15.15%		13.13%		6.09%	
Number of observations	50,818		27,701		45,257	

Table IA.38
Panel Regression of the Value Loading on Characteristics
Controlling for Financial Market Experience, 1999 Participation, and Age

This table reports regressions of the 2007 value loading on (i) the earliest value loading in the panel, (ii) the number of participation years if entry occurs after 1999, (iii) age, and (iv) all other household characteristics, and year, industry, and county fixed effects. In columns (1) to (3), we include a 1999 participation dummy and conduct the estimation on 2007 participants from the panel defined in Section II.D of this Internet Appendix. In columns (4) to (6), we restrict the estimation to 2007 participants who entered risky asset markets after 1999. All variables are described in Table A of the main text.

	Dependent Variable: Value Loading											
	All Participants						Entry After 1999					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)		Risky Portfolio (4)		Stock Portfolio (5)		Fund Portfolio (6)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Initial value loading	0.343	34.41	0.460	32.39	0.124	28.57	0.541	22.77	0.607	19.15	0.181	14.71
Experience												
Number of years since entry	-0.030	-11.40	-0.057	-6.07	-0.016	-10.80	-0.014	-4.78	-0.043	-4.37	-0.013	-7.91
1999 participation dummy	-0.138	-9.56	-0.308	-5.40	-0.105	-12.63						
Financial Characteristics												
Log financial wealth	0.016	6.59	0.073	12.21	0.001	1.02	0.013	2.71	0.072	5.35	0.003	0.98
Log residential real estate wealth	0.000	-0.35	0.003	1.98	-0.001	-4.83	0.000	0.49	0.002	0.90	0.000	-0.80
Log commercial real estate wealth	0.001	1.54	0.007	6.90	0.000	-0.04	-0.001	-0.53	0.002	0.58	0.000	0.11
Leverage ratio	0.004	1.19	0.010	0.89	0.000	0.24	0.002	0.48	-0.003	-0.18	0.003	1.19
Human Capital and Income Risk												
Log human capital	-0.081	-7.07	-0.142	-6.23	-0.021	-4.04	-0.024	-1.12	-0.059	-1.13	-0.003	-0.26
Log income	-0.004	-0.47	0.018	0.97	-0.014	-3.40	-0.016	-1.28	-0.020	-0.54	-0.007	-0.88
Self-employment dummy	-0.051	-3.87	-0.064	-2.43	-0.008	-1.21	-0.112	-3.06	-0.118	-1.49	-0.032	-2.01
Unemployment dummy	-0.026	-2.33	-0.033	-1.15	-0.001	-0.18	-0.010	-0.46	0.035	0.56	0.003	0.27
Conditional income volatility	-0.177	-6.30	-0.051	-0.93	-0.025	-1.87	-0.087	-1.48	-0.023	-0.19	0.006	0.22
Demographic Characteristics												
Age	0.000	0.91	0.005	5.61	0.001	3.79	0.000	-0.22	0.003	1.58	0.001	2.22
Male household head dummy	-0.039	-7.77	-0.057	-4.65	-0.004	-1.21	-0.035	-3.14	-0.022	-0.75	-0.006	-0.97
High school dummy	-0.023	-3.62	-0.078	-4.68	-0.003	-0.85	-0.027	-1.87	-0.069	-1.55	0.002	0.26
Post-high school dummy	-0.011	-2.11	0.037	2.97	-0.015	-5.32	-0.014	-1.05	0.010	0.31	-0.012	-1.82
Economics education dummy	-0.036	-5.05	-0.008	-0.50	-0.019	-4.82	-0.035	-1.96	-0.045	-1.04	-0.008	-0.83
Immigration dummy	-0.069	-7.24	-0.126	-5.86	0.008	1.77	-0.067	-3.97	-0.088	-2.12	0.015	1.59
Family size	0.029	11.56	0.004	0.77	0.012	9.10	0.024	4.22	-0.010	-0.71	0.009	3.34
Adjusted R^2	15.40%		13.36%		6.18%		32.35%		25.05%		12.61%	
Number of observations	50,818		27,701		45,257		10,377		4,181		8,602	

Table IA.39
Panel Regression of the Value Loading on Characteristics
Controlling for Financial Market Experience and 1999 Participation - No Age Variable

This table reports regressions of the 2007 value loading on (i) the earliest value loading in the panel, (ii) the number of participation years if entry occurs after 1999, and (iii) all household characteristics other than age, and year, industry, and county fixed effects. The table excludes age to avoid potential collinearity between age and the number of participation years. In columns (1) to (3), we include a 1999 participation dummy and conduct the estimation on 2007 participants from the panel defined in Section II.D of this Internet Appendix. In columns (4) to (6), we restrict the estimation to 2007 participants who entered risky asset markets after 1999. All variables are described in Table A of the main text.

	Dependent Variable: Value Loading											
	All Participants						Entry After 1999					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)		Risky Portfolio (4)		Stock Portfolio (5)		Fund Portfolio (6)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Initial value loading	0.343	34.41	0.462	32.51	0.124	28.61	0.541	22.78	0.606	19.17	0.181	14.71
Experience												
Number of years since entry	-0.030	-11.40	-0.054	-5.83	-0.016	-10.63	-0.014	-4.84	-0.041	-4.26	-0.012	-7.71
1999 participation dummy	-0.137	-9.54	-0.279	-4.94	-0.102	-12.27						
Financial Characteristics												
Log financial wealth	0.016	6.65	0.074	12.34	0.002	1.28	0.013	2.68	0.073	5.39	0.003	1.22
Log residential real estate wealth	0.000	-0.17	0.004	3.03	-0.001	-4.21	0.000	0.45	0.003	1.22	0.000	-0.37
Log commercial real estate wealth	0.001	1.53	0.007	6.82	0.000	-0.10	-0.001	-0.53	0.002	0.49	0.000	0.08
Leverage ratio	0.004	1.18	0.008	0.78	0.000	0.19	0.002	0.48	-0.003	-0.15	0.003	1.26
Human Capital and Income Risk												
Log human capital	-0.087	-10.64	-0.219	-12.50	-0.034	-8.35	-0.021	-1.28	-0.113	-2.81	-0.021	-2.37
Log income	-0.001	-0.09	0.065	4.08	-0.006	-1.66	-0.017	-1.47	0.009	0.27	0.003	0.36
Self-employment dummy	-0.052	-3.93	-0.071	-2.69	-0.009	-1.41	-0.112	-3.05	-0.123	-1.56	-0.035	-2.15
Unemployment dummy	-0.026	-2.34	-0.032	-1.13	-0.001	-0.20	-0.010	-0.45	0.032	0.51	0.002	0.16
Conditional income volatility	-0.176	-6.25	-0.050	-0.91	-0.023	-1.72	-0.087	-1.50	-0.022	-0.18	0.009	0.34
Demographic Characteristics												
Male household head dummy	-0.038	-7.78	-0.052	-4.26	-0.002	-0.83	-0.036	-3.20	-0.021	-0.71	-0.005	-0.77
High school dummy	-0.024	-3.79	-0.089	-5.38	-0.005	-1.32	-0.027	-1.86	-0.077	-1.74	0.000	-0.03
Post-high school dummy	-0.010	-1.99	0.045	3.63	-0.013	-4.82	-0.014	-1.10	0.015	0.46	-0.010	-1.48
Economics education dummy	-0.036	-5.05	-0.009	-0.56	-0.019	-4.80	-0.035	-1.97	-0.045	-1.04	-0.008	-0.78
Immigration dummy	-0.069	-7.21	-0.121	-5.61	0.009	1.92	-0.067	-3.98	-0.086	-2.07	0.015	1.68
Family size	0.029	11.57	0.002	0.29	0.011	8.86	0.024	4.23	-0.009	-0.64	0.010	3.53
Adjusted R^2	15.40%		13.25%		6.16%		32.35%		25.02%		12.57%	
Number of observations	50,818		27,701		45,257		10,377		4,181		8,602	

Table IA.40
Panel Regression of the Value Loading on Characteristics
Financial Wealth Subgroups

This table reports pooled regressions of the value loading on household characteristics and year, industry, and county fixed effects, in which households are sorted each year into terciles based on previous year financial wealth. We compute the value loading at the level of the risky portfolio. The wealth terciles are obtained from the sample of households over the 1997 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading of Risky Portfolio					
	Low Wealth (1)		Medium Wealth (2)		High Wealth (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.008	1.99	0.020	6.20	0.036	12.19
Log residential real estate	0.000	-0.90	0.001	2.25	0.000	0.78
Log commercial real estate	0.001	2.05	0.000	0.60	0.001	2.08
Leverage ratio	0.003	1.46	-0.017	-5.28	-0.052	-8.31
Human Capital and Income Risk						
Log human capital	-0.041	-3.34	-0.044	-5.23	-0.067	-8.33
Log income	-0.048	-6.01	-0.053	-7.80	-0.028	-4.53
Self-employment dummy	-0.029	-1.74	-0.056	-4.56	-0.010	-1.05
Unemployment dummy	-0.015	-1.79	-0.034	-4.90	-0.025	-3.40
Conditional income volatility	-0.344	-10.67	-0.357	-15.21	-0.365	-16.31
Demographic Characteristics						
Age	0.003	7.69	0.003	9.80	0.002	8.76
Male household head dummy	-0.078	-11.49	-0.070	-14.32	-0.057	-11.79
High school dummy	-0.028	-3.49	-0.015	-2.43	-0.008	-1.30
Post-high school dummy	-0.028	-3.74	-0.018	-3.75	-0.001	-0.25
Economics education dummy	-0.046	-4.85	-0.030	-4.57	-0.008	-1.34
Immigration dummy	-0.060	-5.42	-0.077	-9.14	-0.073	-8.18
Family size	0.045	15.34	0.038	18.45	0.028	12.85
Adjusted R^2	1.96%		2.76%		3.67%	
Number of observations	159,761		168,691		164,769	

Table IA.41
Panel Regression of the Value Loading on Characteristics
Education Subgroups

This table reports pooled regressions of the value loading on household characteristics and year, industry, and county fixed effects, in which households are sorted each year by the head's level of education: no high school in column (1), only high school in column (2), and post-high school in column (3). We compute the value loading at the level of the risky portfolio. The education subsamples are obtained from the sample of households over the 1997 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading of Risky Portfolio					
	No High School (1)		Only High School (2)		Post-High School (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.004	1.36	0.014	7.07	0.025	10.48
Log residential real estate	0.000	0.03	0.000	1.21	0.001	1.32
Log commercial real estate	0.002	2.69	0.001	2.76	0.001	1.99
Leverage ratio	0.008	2.76	0.003	1.50	-0.007	-2.72
Human Capital and Income Risk						
Log human capital	-0.069	-5.28	-0.053	-6.42	-0.051	-5.57
Log income	-0.031	-2.83	-0.053	-9.64	-0.052	-7.45
Self-employment dummy	-0.045	-2.89	-0.028	-2.74	-0.037	-2.19
Unemployment dummy	-0.005	-0.59	-0.014	-2.48	-0.041	-4.01
Conditional income volatility	-0.346	-8.83	-0.361	-15.72	-0.358	-13.00
Demographic Characteristics						
Age	0.003	8.15	0.003	11.81	0.003	9.29
Male household head dummy	-0.035	-3.96	-0.056	-11.15	-0.072	-13.68
Immigration dummy	-0.067	-4.77	-0.051	-5.82	-0.080	-8.01
Family size	0.030	7.20	0.042	19.82	0.032	14.45
Adjusted R^2	2.14%		2.16%		2.75%	
Number of observations	94,287		284,653		210,621	

Table IA.42
Panel Regression of the Value Loading on Characteristics
Identical and Fraternal Twins - Yearly Twin Pair Fixed Effects

This table reports pooled regressions of the value loading on household characteristics and yearly twin-pair fixed effects estimated on the 1999 to 2007 panel of participating households with an adult twin. The value loading is computed at the level of (1) the risky portfolio, (2) the stock portfolio, and (3) the fund portfolio. All variables are described in Table A. Standard errors are clustered at the household level.

	Yearly Twin Pair Fixed Effects					
	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.009	2.00	0.030	2.79	0.010	3.32
Log residential real estate wealth	0.002	1.59	0.005	1.58	0.000	0.14
Log commercial real estate wealth	0.001	0.72	0.006	2.69	0.000	0.31
Leverage ratio	-0.001	-0.18	0.033	1.55	0.000	0.08
Human Capital and Income risk						
Log human capital	-0.070	-4.00	-0.083	-1.93	-0.025	-1.87
Log income	-0.060	-4.53	-0.087	-3.02	-0.023	-2.41
Self-employment dummy	-0.001	-0.05	0.022	0.55	-0.019	-1.44
Unemployment dummy	-0.038	-2.71	-0.017	-0.47	-0.021	-2.25
Conditional income volatility	-0.365	-7.75	-0.459	-3.81	-0.126	-3.69
Demographic Characteristics						
Male household head dummy	-0.027	-2.69	-0.025	-0.97	-0.019	-2.88
High school dummy	-0.035	-2.27	-0.071	-1.83	-0.005	-0.50
Post-high school dummy	0.004	0.30	0.040	1.33	-0.012	-1.47
Economics education dummy	-0.010	-0.73	0.019	0.55	-0.008	-0.75
Family size	0.040	8.26	0.035	2.76	0.015	4.75
R^2	56.29%		61.42%		55.37%	
Adjusted R^2	12.56%		22.79%		10.71%	
Number of observations	104,522		43,906		87,972	

Table IA.43

Panel Regression of the Value Loading on Characteristics

Identical and Fraternal Twins - Year Fixed Effects and Twin Pair Fixed Effects

This table reports pooled regressions of the value loading on (i) household characteristics, (ii) year fixed effects, and (iii) twin pair fixed effects. The estimation is conducted on the 1999 to 2007 panel of participating households with an adult twin. All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Year Fixed Effects and Twin Pair Fixed Effects					
	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.006	1.37	0.021	2.15	0.010	3.63
Log residential real estate wealth	0.002	1.67	0.003	1.29	0.000	0.20
Log commercial real estate wealth	0.000	0.60	0.005	2.63	0.000	0.44
Leverage ratio	0.001	0.13	0.021	1.27	0.001	0.41
Human Capital and Income risk						
Log human capital	-0.076	-4.69	-0.102	-2.54	-0.023	-1.97
Log income	-0.041	-4.36	-0.047	-2.32	-0.022	-3.21
Self-employment dummy	0.004	0.22	0.018	0.50	-0.016	-1.37
Unemployment dummy	-0.028	-2.73	-0.009	-0.32	-0.018	-2.68
Conditional income volatility	-0.359	-7.33	-0.437	-3.49	-0.127	-3.56
Demographic Characteristics						
Male household head dummy	-0.027	-2.58	-0.023	-0.86	-0.019	-2.78
High school dummy	-0.035	-2.18	-0.071	-1.75	-0.005	-0.46
Post-high school dummy	0.003	0.27	0.039	1.24	-0.012	-1.41
Economics education dummy	-0.010	-0.73	0.019	0.51	-0.008	-0.73
Family size	0.035	7.94	0.031	2.64	0.013	4.55
R^2	42.61%		51.16%		43.23%	
Adjusted R^2	37.03%		45.80%		37.46%	
Number of observations	104,522		43,906		87,972	

Table IA.44

Panel Regression of the Value Loading on Characteristics

Identical Twins – Yearly Twin Pair Fixed Effects

This table reports pooled regressions of the value loading on household characteristics estimated on the 1999 to 2007 panel of participating households with an adult *identical* twin. The regressions include yearly twin pair fixed effects in columns (1) to (3) and yearly fixed effects in columns (4) to (6). All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading											
	Yearly Twin Pair Fixed Effects						Yearly Fixed Effects					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)		Risky Portfolio (4)		Stock Portfolio (5)		Fund Portfolio (6)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics												
Log financial wealth	0.008	0.87	0.017	0.83	0.010	1.77	0.007	1.33	0.029	1.91	0.012	3.25
Log residential real estate wealth	0.003	1.55	0.009	1.60	0.001	0.55	0.002	1.13	0.008	1.48	0.000	0.28
Log commercial real estate wealth	-0.001	-0.75	0.006	1.40	0.001	0.71	0.003	2.37	0.014	5.41	0.002	2.65
Leverage ratio	-0.020	-2.12	-0.052	-1.59	-0.010	-1.33	-0.012	-1.59	-0.064	-2.02	-0.009	-1.68
Human Capital and Income Risk												
Log human capital	-0.101	-3.20	-0.158	-2.14	-0.014	-0.60	-0.145	-6.47	-0.362	-6.28	-0.038	-2.83
Log income	-0.042	-1.72	-0.017	-0.35	-0.025	-1.40	-0.015	-0.91	0.111	2.62	-0.039	-3.45
Self-employment dummy	0.029	0.82	0.108	1.25	-0.037	-1.53	-0.026	-0.80	0.010	0.16	-0.038	-1.95
Unemployment dummy	-0.016	-0.72	0.082	1.29	-0.016	-0.89	-0.021	-1.26	0.006	0.12	-0.011	-0.91
Conditional income volatility	-0.311	-3.34	-0.674	-3.43	-0.005	-0.07	-0.442	-6.58	-0.698	-4.39	-0.142	-3.22
Demographic Characteristics												
Male household head dummy							-0.026	-2.02	-0.047	-1.39	0.002	0.25
High school dummy	-0.063	-1.66	-0.148	-1.60	0.032	1.35	-0.021	-1.25	-0.001	-0.02	0.015	1.18
Post-high school dummy	0.014	0.46	0.072	1.06	-0.007	-0.38	-0.003	-0.26	0.093	2.55	-0.026	-2.87
Economics education dummy	-0.005	-0.20	0.041	0.55	-0.029	-1.35	-0.029	-1.49	-0.008	-0.17	-0.016	-1.25
Family size	0.048	4.47	0.050	1.91	0.013	1.96	0.047	7.54	0.052	3.26	0.021	5.50
Adjusted R^2	18.31%		27.21%		13.43%		2.96%		6.30%		2.33%	
Number of observations	32,154		14,048		27,476		32,154		14,048		27,476	

Table IA.45

Panel Regression of the Value Loading on Characteristics

Communication Subgroups - Year Fixed Effects

This table reports pooled regressions of the value loading on year fixed effects and characteristics, estimated on (a) households with twins communicating frequently with each other (“High Communication”), and (b) households with twins communicating infrequently with each other (“Low Communication”). The value loading is computed at the level of the risky portfolio in columns (1) and (2), the stock portfolio in columns (3) and (4), and the fund portfolio in columns (5) and (6). A twin pair is classified as “High Communication” if the frequency of mediated communication and the frequency of unmediated communication are both above the median, and as “Low Communication” otherwise. The communication subsamples are obtained from the 1999 to 2007 panel of participating households with an adult twin. All variables are described in Table A. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading											
	Risky Portfolio				Stock Portfolio				Fund Portfolio			
	High Communication (1)		Low Communication (2)		High Communication (3)		Low Communication (4)		High Communication (5)		Low Communication (6)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics												
Log financial wealth	0.012	2.32	0.010	2.15	0.039	2.81	0.038	2.97	0.014	4.39	0.010	2.94
Log residential real estate wealth	0.000	-0.01	0.002	1.46	0.000	-0.01	0.010	2.71	-0.001	-0.65	-0.001	-1.80
Log commercial real estate wealth	0.003	3.11	0.002	1.83	0.013	5.55	0.009	3.88	0.001	0.84	0.001	0.71
Leverage ratio	0.002	0.25	-0.003	-0.37	-0.002	-0.11	0.018	0.89	0.005	1.11	-0.005	-1.08
Human Capital and Income Risk												
Log human capital	-0.097	-4.56	-0.094	-4.79	-0.186	-3.72	-0.167	-3.39	-0.037	-2.49	-0.035	-2.38
Log income	-0.051	-3.20	-0.047	-3.12	-0.064	-1.88	-0.053	-1.51	-0.033	-3.15	-0.033	-2.91
Self-employment dummy	-0.016	-0.58	-0.011	-0.49	-0.006	-0.09	0.009	0.18	-0.033	-1.86	0.000	0.02
Unemployment dummy	-0.033	-1.97	-0.035	-2.11	-0.026	-0.56	-0.053	-1.00	-0.023	-2.12	-0.013	-1.25
Conditional income volatility	-0.423	-7.05	-0.375	-6.46	-0.385	-2.86	-0.435	-3.41	-0.161	-4.03	-0.163	-4.52
Demographic Characteristics												
Age	0.002	2.58	0.002	1.64	0.009	3.37	0.006	2.63	0.000	0.36	0.000	0.49
Male household head dummy	-0.026	-2.21	-0.020	-1.96	-0.018	-0.56	-0.054	-2.07	0.007	1.01	-0.011	-1.62
High school dummy	-0.025	-1.69	-0.001	-0.07	0.005	0.12	0.026	0.63	-0.007	-0.70	0.004	0.34
Post-high school dummy	-0.004	-0.38	0.005	0.45	0.041	1.11	0.099	3.42	-0.022	-2.59	-0.018	-2.42
Economics education dummy	-0.047	-2.83	-0.019	-1.11	-0.037	-0.83	0.029	0.77	-0.034	-2.62	-0.011	-1.03
Family size	0.046	8.59	0.038	7.27	0.052	3.36	0.055	3.91	0.021	6.14	0.017	4.89
Adjusted R^2	3.15%		2.13%		5.64%		4.08%		2.28%		1.64%	
Number of observations	36,230		42,588		15,462		17,448		30,572		36,008	

Table IA.46
Panel Regression of the Value Loading on Characteristics
Communication Subgroups - Yearly Twin Pair Fixed Effects

This table reports pooled regressions of the value loading on yearly twin pair fixed effects and characteristics, estimated on (a) households with twins communicating frequently with each other ("High Communication"), and (b) households with twins communicating infrequently with each other ("Low Communication"). A twin pair is classified as "High Communication" if the frequency of mediated communication and the frequency of unmediated communication are both above the median, and as "Low Communication" otherwise. This table is a variant of Table IA.45 that incorporates yearly twin-pair fixed effects. The value loading is computed at the level of the risky portfolio in columns (1) and (2), the stock portfolio in columns (3) and (4), and the fund portfolio in columns (5) and (6). All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading											
	Risky Portfolio				Stock Portfolio				Fund Portfolio			
	High Communication (1)		Low Communication (2)		High Communication (3)		Low Communication (4)		High Communication (5)		Low Communication (6)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial characteristics												
Log financial wealth	0.008	1.07	0.009	1.30	0.033	1.79	0.029	1.67	0.013	2.65	0.010	1.91
Log residential real estate wealth	-0.001	-0.44	0.003	1.53	-0.002	-0.50	0.011	2.19	0.000	-0.39	0.000	-0.20
Log commercial real estate wealth	0.001	0.85	-0.001	-0.46	0.006	1.71	0.004	1.22	0.000	0.11	0.000	-0.25
Leverage ratio	-0.002	-0.25	0.000	-0.02	0.043	1.09	0.046	1.51	0.004	0.69	-0.001	-0.11
Human Capital and Income Risk												
Log human capital	-0.055	-1.98	-0.072	-2.51	-0.085	-1.27	-0.124	-1.72	-0.003	-0.15	-0.035	-1.77
Log income	-0.053	-2.47	-0.074	-3.42	-0.085	-1.90	-0.095	-1.89	-0.038	-2.65	-0.020	-1.38
Self-employment dummy	0.015	0.38	-0.018	-0.60	-0.065	-1.03	0.026	0.40	-0.014	-0.57	-0.004	-0.23
Unemployment dummy	-0.023	-0.94	-0.034	-1.58	-0.055	-0.94	0.029	0.42	-0.029	-1.85	-0.016	-1.13
Conditional income volatility	-0.237	-2.98	-0.473	-6.21	-0.162	-0.69	-0.544	-2.84	-0.036	-0.59	-0.193	-3.97
Demographic Characteristics												
Male household head dummy	-0.056	-2.79	-0.010	-0.70	-0.071	-1.38	-0.010	-0.27	-0.025	-1.86	-0.020	-2.14
High school dummy	-0.047	-1.86	-0.027	-1.10	-0.048	-0.75	-0.036	-0.58	-0.039	-2.17	0.011	0.67
Post-high school dummy	-0.012	-0.66	0.020	1.05	-0.032	-0.63	0.086	1.86	-0.007	-0.49	-0.019	-1.53
Economics education dummy	-0.043	-2.10	0.018	0.80	-0.072	-1.20	0.083	1.51	-0.032	-1.88	0.003	0.16
Family size	0.040	5.19	0.040	5.28	0.031	1.40	0.043	2.20	0.020	3.90	0.012	2.35
Adjusted R^2	18.21%		5.22%		29.73%		15.27%		17.43%		4.67%	
Number of observations	36,230		42,588		15,462		17,448		30,572		36,008	

Table IA.47
ACE Decomposition

This table reports an ACE decomposition of the value loading of households with twins over the 1999 to 2007 period. We report the results for (i) all twins, (ii) twins who communicate frequently with each other ("High Communication"), and (iii) twins who communicate infrequently with each other ("Low Communication"). The set of columns labeled "No Controls" presents the ACE decomposition for the value loading itself. The set of columns labeled "With Controls" presents the ACE decomposition for the residual of the value loading, obtained from a regression of the loading on the standard characteristics and year fixed effects. Panel A conducts the analysis at the level of the risky portfolio, Panel B at the level of the stock portfolio, and Panel C at the level of the fund portfolio. A twin pair is classified as "High Communication" if the frequency of mediated communication and the frequency of unmediated communication are both above the median, and as "Low Communication" otherwise.

Panel A: Value Loading of Risky Portfolio				
	No Controls		With Controls	
	Genetic Component	Common Component	Genetic Component	Common Component
All twin pairs	17.0%	0.1%	16.1%	-0.6%
High-communication pairs	35.39%	-6.13%	33.05%	-6.27%
Low-communication pairs	0.87%	4.74%	-0.23%	4.87%
Panel B: Value Loading of Stock Portfolio				
	No Controls		With Controls	
	Genetic Component	Common Component	Genetic Component	Common Component
All twin pairs	12.3%	13.7%	10.8%	11.4%
High-communication pairs	37.58%	7.55%	37.64%	3.74%
Low-communication pairs	-0.24%	11.65%	-3.91%	11.15%
Panel C: Value Loading of Fund Portfolio				
	No Controls		With Controls	
	Genetic Component	Common Component	Genetic Component	Common Component
All twin pairs	8.7%	4.4%	7.3%	3.8%
High-communication pairs	33.80%	-10.21%	32.24%	-10.75%
Low-communication pairs	-8.25%	12.74%	-9.50%	12.69%

Table IA.48
Panel Regression of the Value Loading on Characteristics
Multicollinearity Tests - Risky Portfolio

This table reports multicollinearity tests for the baseline regressions reported in Table III of the main text. The value loading is computed at the level of the risky portfolio.

	Dependent Variable: Value Loading of Risky Portfolio									
	(1)		(2)		(3)		(4)		(5)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics										
Log financial wealth	0.019	16.80	0.015	11.99	0.016	13.19	0.017	13.14	0.014	10.25
Log residential real estate			0.000	0.54	0.002	6.06	0.002	7.32	0.001	4.75
Log commercial real estate			0.001	4.16	0.001	3.30	0.002	6.52	0.002	6.72
Leverage ratio			-0.009	-6.95	-0.004	-2.89	0.000	-0.03	0.000	0.20
Human Capital and Income Risk										
Log human capital					-0.050	-17.41	-0.063	-17.02	-0.022	-4.76
Log income							0.000	0.10	-0.024	-5.97
Self-employment dummy							-0.035	-4.55	-0.026	-3.42
Unemployment dummy							-0.017	-3.95	-0.009	-2.14
Conditional income volatility							-0.364	-22.48	-0.359	-22.20
Demographic Characteristics										
Age									0.002	13.45
Male household head dummy										
High school dummy										
Post-high school dummy										
Economics education dummy										
Immigration dummy										
Family size										
Adjusted R^2	0.23%		0.28%		0.50%		1.25%		1.37%	
Number of observations	589,561		589,561		589,561		589,561		589,561	

Table IA.48 – *Continued*

	Dependent Variable: Value Loading of Risky Portfolio							
	(6)		(7)		(8)		(9)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics								
Log financial wealth	0.016	11.75	0.017	12.44				
Log residential real estate	0.001	4.75	0.001	1.75				
Log commercial real estate	0.002	6.53	0.001	3.97				
Leverage ratio	0.001	0.65	0.000	0.30				
Human Capital and Income Risk								
Log human capital	-0.013	-2.77	-0.052	-9.50	-0.056	-10.35		
Log income	-0.025	-6.34	-0.046	-11.35	-0.027	-7.03		
Self-employment dummy	-0.028	-3.58	-0.034	-4.41	-0.028	-3.65		
Unemployment dummy	-0.011	-2.52	-0.017	-3.99	-0.019	-4.32		
Conditional income volatility	-0.355	-21.98	-0.353	-21.84	-0.336	-20.98		
Demographic Characteristics								
Age	0.002	12.83	0.003	16.02	0.003	21.00	0.004	29.95
Male household head dummy			-0.062	-18.48	-0.062	-18.26	-0.074	-22.71
High school dummy	-0.014	-3.49	-0.014	-3.38	-0.012	-2.99	-0.015	-3.70
Post-high school dummy	-0.029	-8.38	-0.016	-4.64	-0.010	-2.97	-0.028	-8.46
Economics education dummy	-0.022	-4.80	-0.027	-5.94	-0.025	-5.56	-0.031	-6.82
Immigration dummy			-0.066	-11.13	-0.071	-12.06	-0.076	-12.85
Family size			0.036	24.60	0.036	24.93	0.020	18.62
Adjusted R^2	1.47%		2.37%		2.21%		1.43%	
Number of observations	589,561		589,561		589,561		589,561	

Table IA.49
Panel Regression of the Value Loading on Characteristics
Multicollinearity Tests - Stock Portfolio

This table reports multicollinearity tests for the baseline regressions reported in Table III of the main text. The value loading is computed at the level of the stock portfolio.

	Dependent Variable: Value Loading of Stock Portfolio									
	(1)		(2)		(3)		(4)		(5)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics										
Log financial wealth	0.076	28.21	0.059	20.54	0.066	23.16	0.061	20.12	0.051	16.47
Log residential real estate			0.002	2.76	0.007	10.41	0.007	10.10	0.004	6.22
Log commercial real estate			0.008	13.54	0.007	12.09	0.008	13.50	0.008	14.09
Leverage ratio			-0.041	-9.25	-0.016	-3.75	-0.010	-2.37	-0.007	-1.60
Human Capital and Income Risk										
Log human capital					-0.182	-27.40	-0.227	-27.66	-0.086	-8.95
Log income							0.044	5.75	-0.036	-4.79
Self-employment dummy							-0.072	-5.09	-0.039	-2.75
Unemployment dummy							-0.050	-4.69	-0.021	-2.00
Conditional income volatility							-0.389	-12.54	-0.354	-11.52
Demographic Characteristics										
Age									0.008	22.72
Male household head dummy										
High school dummy										
Post-high school dummy										
Economics education dummy										
Immigration dummy										
Family size										
Adjusted R^2	1.15%		1.52%		2.48%		2.90%		3.47%	
Number of observations	331,693		331,693		331,693		331,693		331,693	

Table IA.49 – *Continued*

	Dependent Variable: Value Loading of Stock Portfolio							
	(6)		(7)		(8)		(9)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics								
Log financial wealth	0.051	16.41	0.050	16.15				
Log residential real estate	0.004	6.25	0.003	4.55				
Log commercial real estate	0.008	14.04	0.007	12.36				
Leverage ratio	-0.007	-1.62	-0.008	-1.73				
Human Capital and Income Risk								
Log human capital	-0.086	-8.78	-0.103	-9.50	-0.124	-11.36		
Log income	-0.036	-4.72	-0.044	-5.75	0.017	2.36		
Self-employment dummy	-0.040	-2.82	-0.037	-2.66	-0.021	-1.49		
Unemployment dummy	-0.021	-2.01	-0.021	-2.03	-0.028	-2.69		
Conditional income volatility	-0.355	-11.53	-0.338	-10.98	-0.273	-8.89		
Demographic Characteristics								
Age	0.008	21.81	0.009	23.50	0.011	29.89	0.013	40.67
Male household head dummy			-0.106	-13.57	-0.108	-13.73	-0.122	-15.78
High school dummy	-0.033	-3.30	-0.035	-3.43	-0.029	-2.91	-0.033	-3.27
Post-high school dummy	0.009	1.10	0.016	2.00	0.032	4.00	0.009	1.17
Economics education dummy	0.003	0.31	-0.011	-1.09	-0.008	-0.79	-0.014	-1.39
Immigration dummy			-0.135	-10.33	-0.161	-12.38	-0.162	-12.52
Family size			0.024	7.42	0.030	9.06	0.011	4.07
Adjusted R^2	3.49%		3.95%		3.26%		2.98%	
Number of observations	331,693		331,693		331,693		331,693	

Table IA.50
Panel Regression of the Value Loading on Characteristics
Multicollinearity Tests - Fund Portfolio

This table reports multicollinearity tests for the baseline regressions reported in Table III of the main text. The value loading is computed at the level of the fund portfolio.

	Dependent Variable: Value Loading of Fund Portfolio									
	(1)		(2)		(3)		(4)		(5)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics										
Log financial wealth	0.009	13.39	0.008	10.64	0.008	11.20	0.010	13.02	0.010	11.87
Log residential real estate			0.000	-2.35	0.000	0.91	0.000	2.30	0.000	1.58
Log commercial real estate			0.000	0.62	0.000	0.20	0.000	1.77	0.000	1.83
Leverage ratio			-0.005	-5.24	-0.003	-2.88	-0.001	-1.23	-0.001	-1.16
Human Capital and Income Risk										
Log human capital					-0.018	-9.47	-0.013	-5.76	-0.006	-2.07
Log income							-0.012	-5.54	-0.017	-7.55
Self-employment dummy							-0.007	-1.66	-0.006	-1.30
Unemployment dummy							-0.002	-0.61	0.000	-0.09
Conditional income volatility							-0.114	-13.08	-0.113	-12.96
Demographic Characteristics										
Age									0.000	3.99
Male household head dummy										
High school dummy										
Post-high school dummy										
Economics education dummy										
Immigration dummy										
Family size										
Adjusted R^2	0.15%		0.17%		0.25%		0.43%		0.44%	
Number of observations	523,798		523,798		523,798		523,798		523,798	

Table IA.50 – *Continued*

	Dependent Variable: Value Loading of Fund Portfolio							
	(6)		(7)		(8)		(9)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics								
Log financial wealth	0.011	13.67	0.012	14.57				
Log residential real estate	0.000	1.51	0.000	-0.27				
Log commercial real estate	0.000	1.66	0.000	0.43				
Leverage ratio	-0.001	-0.64	-0.001	-0.98				
Human Capital and Income Risk								
Log human capital	0.001	0.35	-0.021	-6.63	-0.025	-8.01		
Log income	-0.018	-8.12	-0.029	-12.87	-0.016	-7.43		
Self-employment dummy	-0.006	-1.49	-0.011	-2.62	-0.008	-1.94		
Unemployment dummy	-0.002	-0.57	-0.005	-1.97	-0.006	-2.29		
Conditional income volatility	-0.110	-12.70	-0.116	-13.28	-0.106	-12.20		
Demographic Characteristics								
Age	0.000	3.79	0.001	5.53	0.001	10.06	0.001	14.03
Male household head dummy			-0.013	-5.85	-0.012	-5.58	-0.019	-8.89
High school dummy	-0.007	-2.51	-0.006	-2.16	-0.005	-1.74	-0.007	-2.43
Post-high school dummy	-0.021	-9.76	-0.015	-6.89	-0.011	-5.11	-0.020	-9.55
Economics education dummy	-0.014	-4.93	-0.014	-4.76	-0.013	-4.30	-0.015	-5.27
Immigration dummy			-0.003	-0.95	-0.006	-1.68	-0.006	-1.79
Family size			0.017	19.23	0.017	18.96	0.008	12.58
Adjusted R^2	0.57%		0.94%		0.74%		0.44%	
Number of observations	523,798		523,798		523,798		523,798	

Table IA.51
Panel Regression of the Value Loading on Characteristics
Lagged Financial Wealth

This table reports pooled regressions of the year-*t* value loading on (i) financial wealth in year *t*-1, and (ii) all year-*t* characteristics other than financial wealth, and (iii) year, industry, and county fixed effects. The value loading is computed at the level of the risky portfolio in column (1), the stock portfolio in column (2), and the fund portfolio in column (3). The estimation is based on the sample of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Lagged log financial wealth	0.018	12.74	0.052	16.56	0.011	13.11
Log residential real estate	0.000	0.31	0.003	3.35	0.000	-1.51
Log commercial real estate	0.001	2.86	0.008	11.59	0.000	-0.09
Leverage ratio	-0.002	-1.43	-0.014	-2.94	-0.002	-2.13
Human Capital and Income Risk						
Log human capital	-0.063	-10.25	-0.123	-10.32	-0.025	-7.11
Log income	-0.032	-7.25	-0.009	-1.14	-0.024	-9.61
Self-employment dummy	-0.034	-4.05	-0.035	-2.27	-0.012	-2.64
Unemployment dummy	-0.022	-4.47	-0.022	-1.86	-0.007	-2.32
Conditional income volatility	-0.352	-20.25	-0.305	-9.28	-0.108	-11.66
Demographic Characteristics						
Age	0.002	13.03	0.008	20.02	0.001	4.61
Male household head dummy	-0.068	-18.68	-0.112	-13.22	-0.013	-5.74
High school dummy	-0.017	-3.74	-0.039	-3.57	-0.007	-2.33
Post-high school dummy	-0.015	-4.07	0.021	2.48	-0.015	-6.67
Economics education dummy	-0.028	-5.77	-0.010	-0.87	-0.014	-4.63
Immigration dummy	-0.071	-11.03	-0.140	-10.00	-0.003	-0.91
Family size	0.036	23.16	0.021	5.91	0.017	17.85
Adjusted R^2	2.52%		4.15%		0.96%	
Number of observations	493,221		284,563		439,294	

Table IA.52
Panel Regression of the Value Loading on Characteristics
Lagged Value Loading and Lagged Financial Wealth

This table reports pooled regressions of the year-*t* value loading on (i) the value loading in year *t*-1, (ii) financial wealth in year *t*-1, (iii) all other year-*t* household characteristics, and (iv) year, industry, and county fixed effects. We compute the value loading at the level of the risky portfolio in column (1), the stock portfolio in column (2), and the fund portfolio in column (3). The estimation is based on the sample of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Lagged value loading	0.803	265.95	0.850	353.10	0.838	380.77
Financial Characteristics						
Lagged log financial wealth	0.006	13.09	0.012	12.75	0.001	2.40
Log residential real estate	0.000	-2.46	0.000	0.49	0.000	-5.59
Log commercial real estate	0.000	1.24	0.001	8.55	0.000	0.00
Leverage ratio	0.000	0.27	0.000	0.10	-0.001	-2.23
Human Capital and Income Risk						
Log human capital	-0.012	-5.54	-0.019	-5.29	-0.004	-3.48
Log income	-0.010	-5.49	-0.005	-1.40	-0.006	-5.91
Self-employment dummy	-0.008	-2.86	-0.006	-1.35	-0.001	-1.02
Unemployment dummy	-0.009	-4.81	-0.012	-3.16	-0.001	-0.80
Conditional income volatility	-0.078	-14.93	-0.040	-4.59	-0.017	-6.95
Demographic Characteristics						
Age	0.001	10.70	0.002	14.27	0.000	6.98
Male household head dummy	-0.017	-15.44	-0.024	-10.42	-0.002	-3.83
High school dummy	-0.005	-4.11	-0.009	-3.20	-0.002	-3.25
Post-high school dummy	-0.004	-3.13	0.007	2.85	-0.004	-6.60
Economics education dummy	-0.006	-4.06	0.002	0.79	-0.004	-4.79
Immigration dummy	-0.018	-9.25	-0.031	-8.12	0.001	0.79
Family size	0.008	17.11	0.003	3.39	0.003	11.91
Adjusted R^2	65.72%		72.70%		74.02%	
Number of observations	493,221		270,732		433,828	

Table IA.53
Panel Regression of the Value Loading on Characteristics
Controlling for the Volatility of Persistent Labor Income Risk

This table reports pooled regressions of the value loading on the volatility of persistent labor income risk, household characteristics, and year, industry, and county fixed effects. The value loading is computed at the level of the risky portfolio in column (1), the stock portfolio in column (2), and the fund portfolio in column (3). The computations are based on the representative panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. The volatility of persistent income risk is defined in Section II.F of this Internet Appendix and all the other variables are described in Table A. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.016	11.36	0.048	15.61	0.011	13.85
Log residential real estate	0.000	0.19	0.003	3.91	0.000	-1.03
Log commercial real estate	0.001	2.76	0.007	11.81	0.000	-0.17
Leverage ratio	-0.002	-1.34	-0.011	-2.50	-0.002	-1.82
Human Capital and Income Risk						
Log human capital	-0.046	-8.50	-0.096	-8.97	-0.019	-6.11
Log income	-0.040	-9.90	-0.038	-5.03	-0.028	-12.09
Self-employment dummy	-0.059	-7.71	-0.061	-4.38	-0.020	-4.55
Unemployment dummy	-0.025	-5.61	-0.028	-2.66	-0.008	-2.86
Persistent income volatility	-0.350	-12.50	-0.304	-5.47	-0.104	-6.68
Demographic Characteristics						
Age	0.003	17.14	0.009	24.40	0.001	6.08
Male household head dummy	-0.063	-18.67	-0.107	-13.64	-0.013	-5.84
High school dummy	-0.014	-3.42	-0.035	-3.46	-0.006	-2.18
Post-high school dummy	-0.019	-5.42	0.014	1.73	-0.016	-7.25
Economics education dummy	-0.028	-6.18	-0.012	-1.19	-0.014	-4.88
Immigration dummy	-0.071	-11.91	-0.140	-10.73	-0.005	-1.42
Family size	0.035	23.99	0.024	7.25	0.017	18.89
Adjusted R^2	1.96%		3.81%		0.82%	
Number of observations	589,561		331,693		523,798	

Table IA.54
Panel Regression of the Value Loading on Characteristics
Controlling for the Volatility of Transitory Labor Income Risk

This table reports pooled regressions of the value loading on the volatility of transitory labor income risk, household characteristics, and year, industry, and county fixed effects. The value loading is computed at the level of the risky portfolio in column (1), the stock portfolio in column (2), and the fund portfolio in column (3). The computations are based on the representative panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. The volatility of transitory income risk is defined in Section II.F of this Internet Appendix and all the other variables are described in Table A. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.017	12.43	0.050	16.17	0.012	14.59
Log residential real estate	0.001	2.15	0.003	4.72	0.000	-0.06
Log commercial real estate	0.001	3.94	0.007	12.37	0.000	0.43
Leverage ratio	0.001	0.56	-0.007	-1.60	-0.001	-0.84
Human Capital and Income Risk						
Log human capital	-0.056	-10.09	-0.107	-9.81	-0.022	-6.94
Log income	-0.045	-11.11	-0.043	-5.63	-0.029	-12.75
Self-employment dummy	-0.031	-4.03	-0.034	-2.42	-0.010	-2.36
Unemployment dummy	-0.017	-3.79	-0.020	-1.94	-0.005	-1.84
Transitory income volatility	-0.415	-22.85	-0.407	-11.85	-0.138	-14.07
Demographic Characteristics						
Age	0.003	15.76	0.009	23.31	0.001	5.38
Male household head dummy	-0.062	-18.38	-0.106	-13.52	-0.012	-5.81
High school dummy	-0.014	-3.35	-0.034	-3.41	-0.006	-2.14
Post-high school dummy	-0.015	-4.41	0.017	2.10	-0.015	-6.77
Economics education dummy	-0.027	-5.91	-0.011	-1.07	-0.014	-4.74
Immigration dummy	-0.066	-11.20	-0.135	-10.33	-0.003	-0.98
Family size	0.036	24.82	0.025	7.50	0.017	19.34
Adjusted R^2	2.43%		3.98%		0.96%	
Number of observations	589,561		331,693		523,798	

Table IA.55
Panel Regression of the Value Loading on Characteristics
Alternative Specification of Labor Income

This table reports pooled regressions of the value loading on household characteristics and year, industry, and county fixed effects, estimated using the alternative specification of household income described in Section VII.C.4 of this Internet Appendix. We estimate income for each individual in the household, and then aggregate up individual variables to produce household measures of human capital and income risk. The value loading is computed at the level of the risky portfolio in column (1), stock portfolio in column (2), and fund portfolio in column (3). The computations are based on the representative panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.020	15.06	0.061	20.17	0.012	15.44
Log residential real estate	0.000	-0.85	0.002	3.15	0.000	-1.30
Log commercial real estate	0.001	4.75	0.008	13.03	0.000	0.98
Leverage ratio	0.000	0.01	-0.012	-3.17	0.001	0.99
Human Capital and Income Risk						
Log human capital	-0.014	-4.34	-0.024	-3.27	-0.008	-3.66
Log income	-0.059	-16.08	-0.082	-10.63	-0.034	-15.01
Self-employment dummy	-0.040	-5.55	-0.048	-3.43	-0.010	-2.37
Unemployment dummy	-0.017	-4.12	-0.024	-2.35	-0.005	-1.76
Conditional income volatility	-0.272	-20.81	-0.211	-7.89	-0.107	-14.00
Demographic Characteristics						
Age	0.003	19.34	0.010	28.16	0.001	7.16
Male household head dummy	-0.072	-22.71	-0.114	-15.12	-0.017	-8.52
High school dummy	-0.012	-2.90	-0.035	-3.49	-0.005	-1.96
Post-high school dummy	-0.021	-6.41	0.012	1.58	-0.017	-8.47
Economics education dummy	-0.031	-7.18	-0.015	-1.57	-0.015	-5.44
Immigration dummy	-0.073	-12.50	-0.130	-10.09	-0.009	-2.47
Family size	0.030	24.31	0.015	5.14	0.014	18.65
Adjusted R^2	2.14%		3.96%		0.89%	
Number of observations	646,807		358,201		575,964	

Table IA.56
Panel Regression of the Value Loading on Characteristics
Singles

This table reports pooled regressions of the value loading on characteristics and year, industry, and county fixed effects, estimated on the set of households with a single person. The value loading is computed at the level of the risky portfolio in column (1), stock portfolio in column (2), and fund portfolio in column (3). The estimation is based on singles from the 1999 to 2007 sample that satisfy the data availability requirements stated in Section II.D of this Internet Appendix. All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.026	10.11	0.053	9.93	0.016	10.47
Log residential real estate	0.000	1.10	0.003	3.19	0.000	-0.43
Log commercial real estate	0.000	0.04	0.005	3.56	0.000	0.23
Leverage ratio	-0.002	-0.75	-0.007	-1.16	-0.003	-1.79
Human Capital and Income Risk						
Log human capital	-0.085	-7.39	-0.130	-6.24	-0.027	-4.09
Log income	-0.039	-5.38	-0.036	-2.91	-0.030	-8.12
Self-employment dummy	-0.032	-1.83	-0.024	-0.78	-0.015	-1.49
Unemployment dummy	-0.029	-3.52	-0.029	-1.65	-0.014	-2.81
Conditional income volatility	-0.300	-11.36	-0.303	-6.16	-0.081	-5.75
Demographic Characteristics						
Age	0.002	4.45	0.008	11.48	0.000	0.83
Male household head dummy	-0.113	-17.39	-0.164	-11.23	-0.029	-7.08
High school dummy	-0.027	-3.13	-0.048	-2.40	-0.011	-2.10
Post-high school dummy	0.002	0.23	0.032	2.03	-0.007	-1.69
Economics education dummy	-0.036	-4.11	-0.030	-1.54	-0.016	-2.93
Immigration dummy	-0.070	-5.44	-0.138	-5.18	-0.016	-2.19
Adjusted R^2	3.23%		5.39%		1.30%	
Number of observations	183,700		98,127		152,783	

Table IA.57

Panel Regression of the Value Loading on Characteristics

Controlling for the Exposure to the Size Factor

This table reports pooled regressions of the portfolio value loading on (i) the size loading of the risky portfolio, (ii) other household characteristics and (iii) year, industry, and county fixed effects. The value loading is computed at the level of the risky portfolio in column (1), the stock portfolio in column (2), and the fund portfolio in column (3). We regress the risky share on the same characteristics and fixed effects in column (4). The computations are based on the representative panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Size loading of the risky portfolio	-0.666	-93.05	-0.657	-76.25	-0.319	-58.78
Financial Characteristics						
Log financial wealth	0.003	3.24	0.007	2.71	0.013	16.29
Log residential real estate	0.001	5.70	0.003	4.29	0.000	2.23
Log commercial real estate	0.002	8.99	0.007	13.63	0.000	2.11
Leverage ratio	0.006	5.27	0.011	3.00	0.001	1.09
Human Capital and Income Risk						
Log human capital	-0.034	-8.47	-0.087	-9.43	-0.012	-4.19
Log income	-0.012	-3.88	-0.007	-0.98	-0.016	-7.56
Self-employment dummy	-0.002	-0.36	-0.012	-0.98	-0.003	-0.80
Unemployment dummy	0.000	-0.07	0.004	0.45	-0.001	-0.34
Conditional income volatility	-0.080	-7.09	-0.017	-0.69	-0.039	-4.79
Demographic Characteristics						
Age	0.001	8.76	0.006	18.74	0.000	-1.37
Male household head dummy	-0.014	-5.41	-0.047	-6.71	0.001	0.30
High school dummy	-0.012	-3.76	-0.038	-4.15	-0.003	-1.40
Post-high school dummy	-0.004	-1.41	0.017	2.36	-0.009	-4.59
Economics education dummy	-0.014	-4.06	-0.004	-0.48	-0.009	-3.48
Immigration dummy	-0.036	-8.26	-0.081	-7.21	0.002	0.55
Family size	0.012	11.86	-0.002	-0.61	0.010	12.07
Adjusted R^2	41.40%		22.14%		12.94%	
Number of observations	589,561		331,693		523,798	

Table IA.58
Panel Regression of the Value Loading on Characteristics
U.S. Factors

This table reports pooled regressions of the U.S. value loading on household characteristics and year, industry, and county fixed effects. The value loading is computed using the U.S. factors and at the level of the risky portfolio in column (1), stock portfolio in column (2), and fund portfolio in column (3). The computations are based on the representative panel of households over the 1999 to 2007 period defined in Section II.D of this Internet Appendix. All variables are described in Table A of the main text. Standard errors are clustered at the household level.

	Dependent Variable: Value Loading					
	Risky Portfolio (1)		Stock Portfolio (2)		Fund Portfolio (3)	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial Characteristics						
Log financial wealth	0.016	13.18	0.050	19.95	0.011	12.57
Log residential real estate	-0.001	-2.11	0.003	5.00	-0.001	-3.45
Log commercial real estate	0.001	4.43	0.007	14.94	0.001	2.97
Leverage ratio	-0.039	-0.32	-0.237	-0.67	-0.215	-2.32
Human Capital and Income Risk						
Log human capital	-0.046	-9.11	-0.081	-9.04	-0.022	-6.47
Log income	-0.044	-12.07	-0.031	-4.96	-0.025	-10.53
Self-employment dummy	-0.044	-6.37	-0.038	-3.33	-0.012	-2.75
Unemployment dummy	-0.019	-4.67	-0.014	-1.62	-0.008	-2.82
Conditional income volatility	-0.349	-24.25	-0.251	-10.07	-0.095	-10.48
Demographic Characteristics						
Age	0.002	14.21	0.006	20.41	0.001	11.33
Male household head dummy	-0.066	-21.63	-0.076	-11.81	-0.021	-9.79
High school dummy	-0.017	-4.46	-0.023	-2.81	-0.015	-5.45
Post-high school dummy	-0.022	-7.05	0.022	3.36	-0.021	-9.29
Economics education dummy	-0.029	-7.11	-0.007	-0.84	-0.014	-4.62
Immigration dummy	-0.066	-12.00	-0.136	-12.81	0.006	1.57
Family size	0.033	25.76	0.017	6.44	0.013	14.40
Adjusted R^2	2.58%		3.81%		1.18%	
Number of observations	589,561		331,693		523,798	

Figure IA.1
Percentage of Public Equity Directly Held by Households, Growth vs. Value

This figure illustrates the percentage of market capitalization of Swedish firms owned directly by Swedish households at the end of 2003 as a function of firm size and value/growth type. The calculations are based on all the 352 firms listed on Swedish exchanges and all Swedish households that own stocks at the end of 2003. The categories growth, neutral, and value correspond to the terciles based on the firms' exposure to the HML factor.

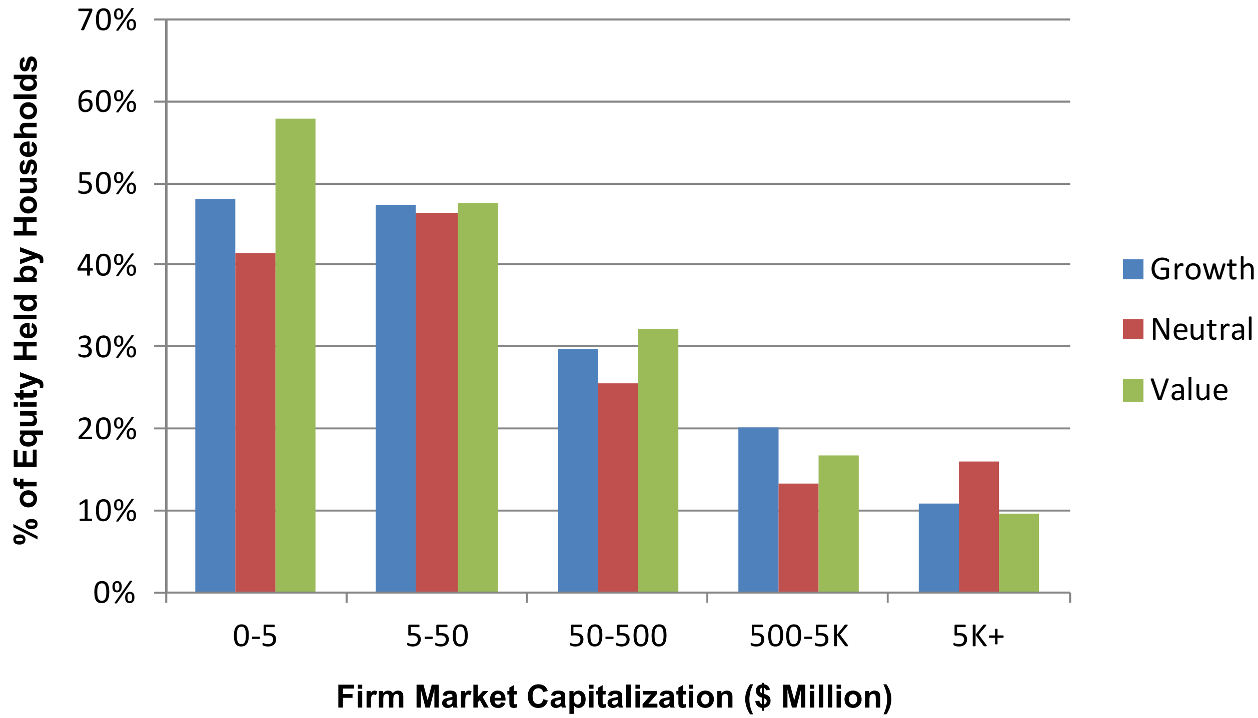

Figure IA.2
Value Ladder
Equal-Weighted Households

This figure illustrates the value loading of the risky portfolio (left panel) and stock portfolio (right panel) for different cohorts of households. Each solid line corresponds to the average equal-weighted loadings of households in a given cohort. Each dotted line is the corresponding predicted value, obtained using age, wealth variables, and human capital multiplied by the household-level baseline regression coefficients in Table III of the main text. A cohort is defined as a 5-year age bin. The first cohort contains households with a head aged between 30 and 34 in 1999, while the oldest cohort has a head aged between 70 and 74 in 1999. The loadings of all households in year *t* are demeaned to control for changes in the composition of the Swedish stock market. Panel A is based on the panel of all Swedish risky asset market participants and Panel B on the panel of all Swedish direct stockholders over the 1999 to 2007 period.

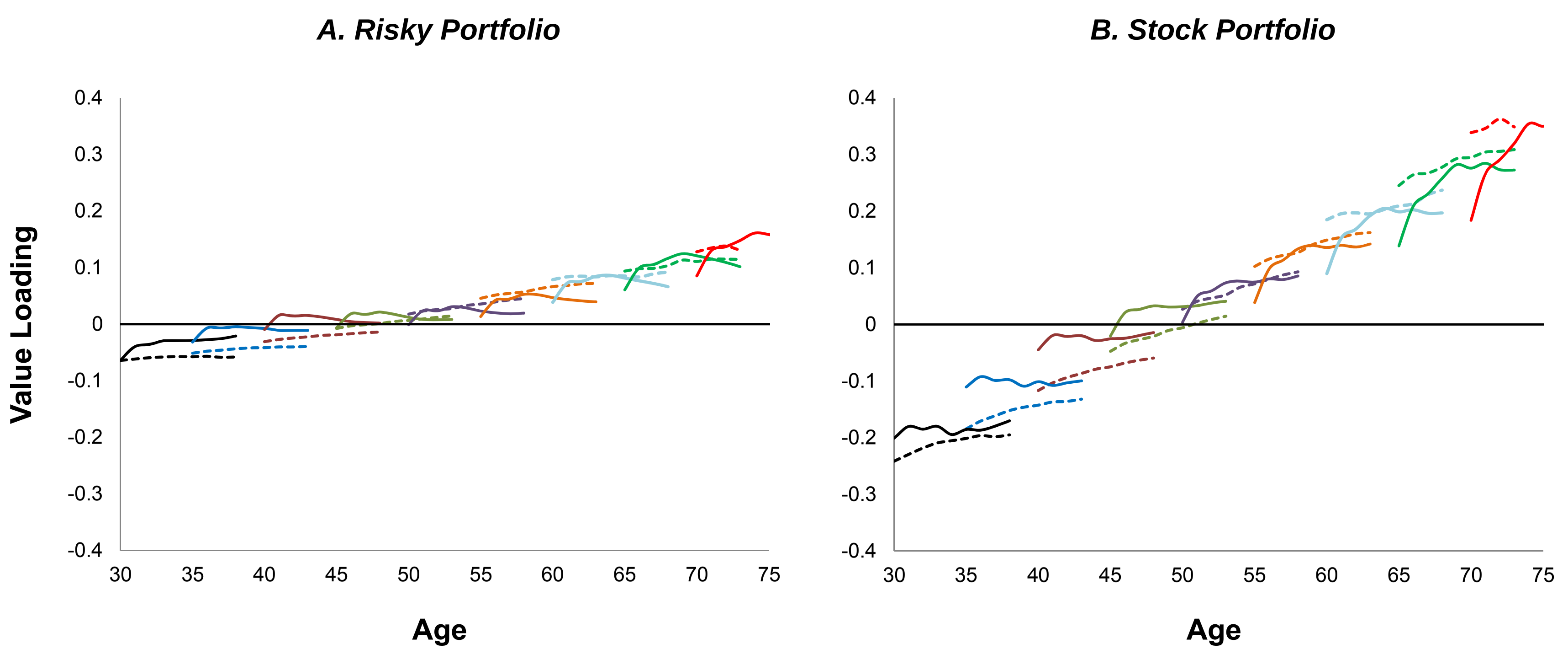

Figure IA.3
Value Ladder
All Predictors

This figure illustrates the value loading of the risky portfolio (left panel) and stock portfolio (right panel) for different cohorts of households. Each solid line corresponds to the average loadings of households in a given cohort, weighted by financial wealth. Each dotted line is the corresponding predicted value, obtained using all the characteristics in the household-level baseline regression in Table III of the main text. A cohort is defined as a 5-year age bin. The first cohort contains households with a head aged between 30 and 34 in 1999, while the oldest cohort has a head aged between 70 and 74 in 1999. The loadings of all households in year *t* are demeaned to control for changes in the composition of the Swedish stock market. Panel A is based on the panel of all Swedish risky asset market participants and Panel B on the panel of all Swedish direct stockholders over the 1999 to 2007 period.

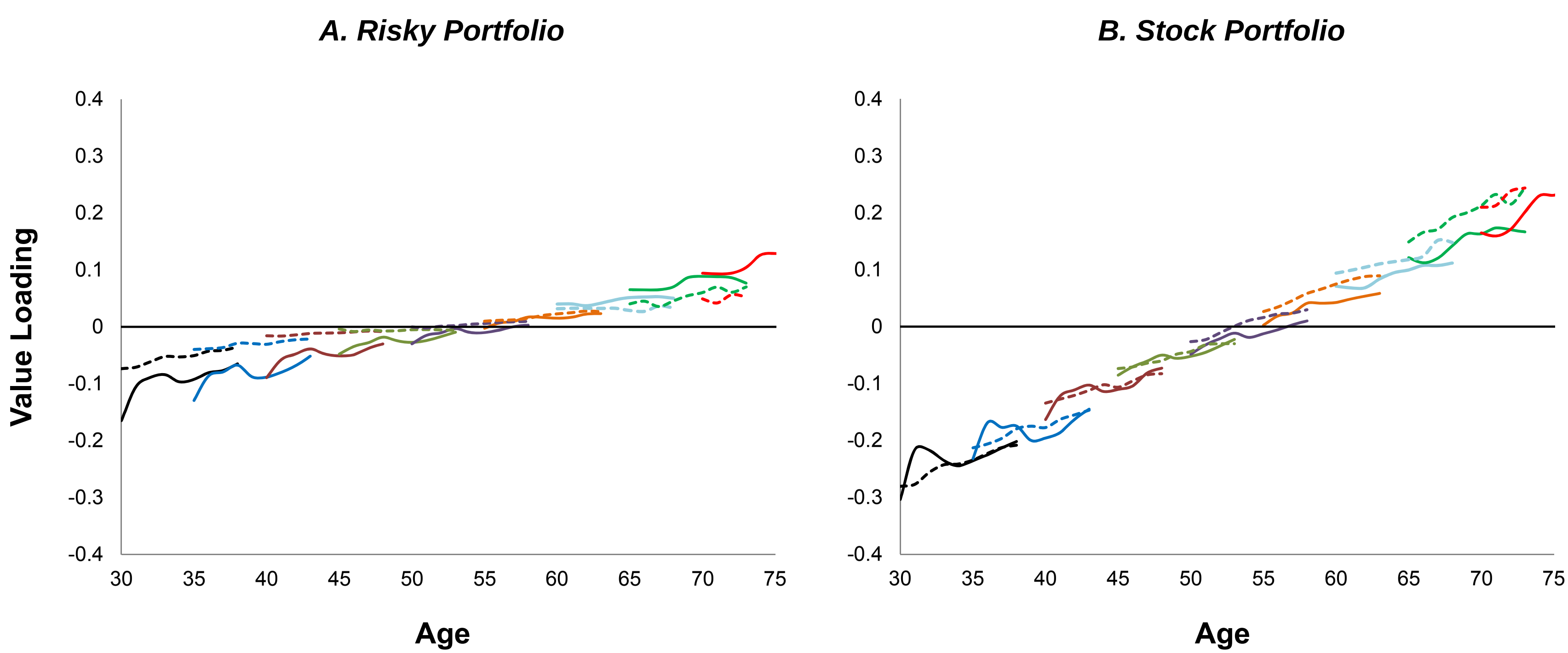

Figure IA.4
The Value Ladder Across Industries
Stock Portfolio

This figure illustrates the value loading of the stock portfolio for cohorts of households in the top 25% (solid lines) and the bottom 25% (dotted lines) of industry sensitivity. We measure industry sensitivity by regressing per-capita income growth in the industry on per-capita income growth in the economy. Each line corresponds to a given cohort, defined as a 5-year age bin. The first cohort contains households with a head aged between 30 and 34 in 1999, while the oldest cohort has a head aged between 70 and 74 in 1999. The loadings of all households in year *t* are demeaned to control for changes in the composition of the Swedish stock market. A cohort's loading in year *t* is the wealth-weighted average year-*t* loading of households in the cohort. The figure is based on the panel of all Swedish direct stockholders over the 1999 to 2007 period.