Appendix To "Twin Picks: Disentangling The Determinants of Risk-Taking in Household Portfolios"*

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1. Data and Estimation Methodology

1.1. Estimating the Beta Coefficient and Sharpe Ratio of Household Portfolios

We estimate portfolio characteristics with the methodology used in Calvet Campbell and Sodini (2007, henceforth "CCS 2007"). Since Sweden is a small and open economy, we assume that assets are priced on world markets in an international currency. Specifically, the CAPM holds in dollar-denominated excess returns relative to the US Treasury bill ("global CAPM"). The market return $r^e_{m,t}$ is measured as the US dollar return of the MSCI world index in excess of the US T-bill. Under covered interest rate parity, $r^e_{m,t}$ coincides with the excess return (in Swedish kronor) of the currency-hedged index relative to the Swedish T-bill.

Excess returns in the domestic currency (the Swedish krona) with respect to the domestic interest rate satisfy:

$$\mathbb{E}(r^e_{j,t}) = \beta_j \mathbb{E}(r^e_{m,t}). \tag{1.1}$$

From the perspective of a Swedish investor, the global pricing model induces a domestic version of the CAPM in which the currency-hedged world index is the efficient benchmark.

The global CAPM is implemented as follows. First, we estimate the sample mean $r^e_{m,t}$ and sample variance σ^2_m of the world index over the 1983-2004 period. Second for

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each asset $j \in \{1, .., N\}$, we estimate β_j by regressing the asset's domestic excess return on the currency-hedged world index, and then compute the $N \times N$ variance-covariance matrix R of the regression residuals. Third, we infer the mean vector $\mu = r^e_{m,t}\ \beta$ and variance-covariance matrix $\Sigma = \sigma^2_m \beta\beta' + R$ of domestic excess returns. The beta coefficient of each asset or mutual fund is computed using 1994-2004 monthly data, or the available subset for shorter-lived assets.

For each household, the dataset contains holdings at the security level and the balances of bank accounts. The risk-free rate in Sweden is proxied by the yield on the one-month Swedish T-bill. Since the spread between the risk-free rate and the yield on bank deposits can be considered as a compensation for bank services, bank balances are assumed to earn the risk-free rate. The same assumption is extended to money market funds and verified empirically. We use the estimated moments of individual asset returns to calculate the mean, variance, and Sharpe ratio of household portfolio returns. Wermers (2000) has used a similar method to evaluate the properties of stock portfolios held by mutual funds.

1.2. Bank Account Imputation

In the Swedish Wealth Registry, the balance of a bank account is frequently unreported when the account yields less than 100 Swedish kronor (or \$11) during the year. This problem affects about $2,000,000$ of the $4,800,000$ households in the 2002 dataset. As in CCS (2007, 2009*a*, 2009*b*), the method used in the main text relies on the subsample of individuals (about 250,000) for which we observe the bank account balance even though the earned interest is less than 100 kronor. We regress the balance onto the following observable characteristics: age and squared age of household head, household size, real estate wealth, level and squared level of household disposable income, and financial wealth other than bank accounts. The coefficient of determination is modest ($R^2 = 1.2\%$) but the regression coefficients are highly significant. We use the regression to impute the account balances of individual household members and then aggregate the imputed amounts to infer the household bank account balance.

1.3. Measuring Labor Income and Human Capital

We adopt the specification of labor income used in Cocco, Gomes and Maenhout (2005). The log of household h's real income in year t is given by

$$\ln(L_{h,t}) = a_h + b'x_{h,t} + \nu_{h,t} + \varepsilon_{h,t},$$

where a_h is a household fixed effect, $x_{h,t}$ is a vector of characteristics, $\nu_{h,t}$ is an idiosyncratic random permanent component, and $\varepsilon_{h,t}$ is an idiosyncratic temporary shock distributed as $\mathcal{N}(0, \sigma^2_{\varepsilon,h})$. The permanent component $\nu_{h,t}$ follows the random walk:

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

where $\xi_{h,t} \sim \mathcal{N}(0, \sigma^2_{\xi,h})$ is the shock to permanent income in period t. The Gaussian innovations $\varepsilon_{h,t}$ and $\xi_{h,t}$ are white noise and are uncorrelated with each other at all leads and lags.

All income measures are deflated to 1993 prices using the consumer price index published by Statistics Sweden. The vector of characteristics $x_{h,t}$ include household size, marital status, age, and unemployment and business dummies. The age and unemployment and business dummies refer to the household head, who is defined as the household member with the highest income in 2002.

We classify households by the head's age and education level. Since the vast majority of Swedish residents retire at 65, we distinguish between two age groups: less than 65, or at least 65. We also consider three education groups: (1) basic or missing education; (2) high school education; and (3) post-high school education. For each of the six groups, we estimate the income process on disposable nonfinancial income between 1993 and 2002.

Estimation. We estimate a_h and b by regressing log income on characteristics and a household fixed effect. In order to estimate $\sigma^2_{\xi,h}$ and $\sigma^2_{\varepsilon,h}$, we define the income growth innovation $u_{h,t}$ as the difference between the income growth, $\ln(L_{h,t}/L_{h,t-1})$, and the fitted value, $b'(x_{h,t} - x_{h,t-1})$. The sample variance of the cumulative residual,

$$v_{d,h} = Var(u_{h,t-d+1} + ... + u_{h,t}),$$

is an estimate of $d\sigma^2_{\xi,h} + 2\sigma^2_{\varepsilon,h}$. As in Carroll and Samwick (1997), we estimate $\sigma^2_{\xi,h}$ and $\sigma^2_{\varepsilon,h}$ by running the OLS regression of $(v_{1,h}; ...; v_{n,h})'$ on

$$\begin{pmatrix} 2 & 2 \\ \vdots & \vdots \\ n & 2 \end{pmatrix}.$$

We use $n = 5$ throughout our analysis. In unreported work, we have checked that we obtain similar results for $n \in \{3, 4\}$.

Permanent Income. Let $\mu_{\nu,h,t} = \mathbb{E}_t(\nu_{h,t})$ and $\sigma^2_{\nu,h,t} = Var_t(\nu_{h,t})$, respectively, denote the permanent component's mean and variance conditional on current and past income. These conditional moments satisfy the recursion:

$$\mu_{\nu,h,t} = \mu_{\nu,h,t-1} + \frac{\sigma^2_{\nu,h,t-1} + \sigma^2_{\xi,h}}{\sigma^2_{\nu,h,t-1} + \sigma^2_{\xi,h} + \sigma^2_{\varepsilon,h}}(\ell_{h,t} - \mu_{\nu,h,t-1}), \tag{1.2}$$

$$\sigma^2_{\nu,h,t} = \sigma^2_{\varepsilon,h} \frac{\sigma^2_{\nu,h,t-1} + \sigma^2_{\xi,h}}{\sigma^2_{\nu,h,t-1} + \sigma^2_{\xi,h} + \sigma^2_{\varepsilon,h}}, \tag{1.3}$$

where $\ell_{h,t} = \ln(L_{h,t}) - a_h - b' x_{h,t}$ denotes the difference between log income and its fitted value.[1] For all t, we set $\sigma^2_{\nu,h,t}$ equal to the steady state[2]

$$\sigma^2_{\nu,h} = \frac{1}{2}\left(\sqrt{\sigma^4_{\xi,h} + 4\sigma^2_{\varepsilon,h}\sigma^2_{\xi,h}} - \sigma^2_{\xi,h}\right).$$

We assume that permanent income coincides with actual income at date 0 ($\mu_{\nu,h,0} = 0$), and iterate forward the relation: $\mu_{\nu,h,t} = \mu_{\nu,h,t-1} + (\ell_{h,t} - \mu_{\nu,h,t-1})\sigma^2_{\nu,h}/\sigma^2_{\varepsilon,h}$.

Expected Human Capital. We consider that the components of $x_{h,t}$ are constant over time. The only exception is age, which is fully predictable. Under these simplifying assumptions, $x_{h,t+n}$ is known with certainty at date t, and therefore

$$\begin{aligned}\mathbb{E}_t(L_{h,t+n}) &= e^{a_h + b' x_{h,t+n}} \mathbb{E}_t\left(e^{\nu_{h,t+n}+\varepsilon_{h,t+n}}\right) \\ &= e^{a_h + b' x_{h,t+n} + \mathbb{E}_t(\nu_{h,t+n}) + 0.5\sigma^2_{\varepsilon,h} + 0.5 Var_t(\nu_{h,t+n})}.\end{aligned}$$

The relation $\nu_{h,t+n} = \nu_{h,t} + \xi_{h,t+1} + ... + \xi_{h,t+n}$ implies that

$$H_{h,t} = L_{h,t} + \sum_{n=1}^{T_h} \pi_{h,t,t+n} \frac{e^{a_h + b' x_{h,t+n} + \mu_{\nu,h,t} + 0.5(\sigma^2_{\varepsilon,h} + \sigma^2_{\nu,h} + n\sigma^2_{\xi,h})}}{(1+r)^n}.$$

We use this method in all the tables of the main text and this Appendix.

In unreported work, we have considered an alternative method in which labor income is riskless: $\sigma_{\varepsilon,h} = \sigma_{\xi,h} = 0$. We have verified that our empirical results are strongly robust to this alternative imputation of expected human capital.

2. Robustness Checks

2.1. Identical vs. Fraternal Twins

In the main text, we have analyzed the risky share on all twin pairs in order to use the largest possible number of observations. We now investigate the difference between identical and fraternal twins.

[1] Assume that $\mathbb{E}_{t-1}(\nu_{h,t-1})$ and $Var_{t-1}(\nu_{h,t-1})$ are known. As of date $t-1$, the permanent component $\nu_{h,t} = \nu_{h,t-1} + \xi_{h,t}$ has conditional mean $\mathbb{E}_{t-1}(\nu_{h,t}) = \mathbb{E}_{t-1}(\nu_{h,t-1})$ and variance $Var_{t-1}(\nu_{h,t}) = Var_{t-1}(\nu_{h,t-1}) + \sigma^2_{\xi,h}$. The observed innovation $\ell_{h,t} = \nu_{h,t} + \varepsilon_{h,t}$ and the permanent component $\nu_{h,t}$ are jointly normal, which implies that (1.2) holds and that:

$$Var_t(\nu_{h,t}) = Var_{t-1}(\nu_{h,t})\left\{1 - [Corr_{t-1}(\nu_{h,t};\ell_{h,t})]^2\right\}.$$

Since $Var_{t-1}(\nu_{h,t}) = \sigma^2_{\nu,h,t-1} + \sigma^2_{\xi,h}$, and $[Corr_{t-1}(\nu_{h,t};\ell_{h,t})]^2 = (\sigma^2_{\nu,h,t-1} + \sigma^2_{\xi,h})/(\sigma^2_{\nu,h,t-1} + \sigma^2_{\xi,h} + \sigma^2_{\varepsilon,h})$, we conclude that (1.3) holds as well.

[2] We set $\sigma^2_{\nu,h}$ equal to zero if the argument of the square root, $\sigma^4_{\xi,h} + 4\sigma^2_{\varepsilon,h}\sigma^2_{\xi,h}$, has a negative estimate.

Summary Statistics and ACE Decomposition. In the first six columns of Table A1, we report the mean, standard deviation, and pairwise correlation of characteristics for identical and fraternal twins. Differences between the means of the two samples are modest. As one would expect, the pairwise correlations of all characteristics are substantially higher for identical twins than for fraternal twins, and the standard deviations are correspondingly lower in the group of identical twins. These findings suggest that the characteristic may have a genetic component.

In the last two columns of Table A1, we report the results of an ACE decomposition, a linear model of genetic effects that has been widely used in medicine and is now starting to be used in household finance (e.g. Barnea Cronqvist and Siegel 2010; Cesarini et al. 2009*a*, 2009*b*). In the ACE model, the characteristic $x_{i,j}$ of twin i in pair j is the sum of a genetic component $a_{i,j}$, a common component c_i, and an idiosyncratic component $\varepsilon_{i,j}$:

$$x_{i,j} = a_{i,j} + c_i + \varepsilon_{i,j}.$$

The genetic, common, and idiosyncratic components are uncorrelated. The pairwise correlation of the genetic component, $Corr(a_{i,1}; a_{i,2})$, equals 1 for identical twins and 1/2 for fraternal twins. In the simplest specifications, the genetic component has the same variance in the group of identical twins as in the group of fraternal twins. Similarly, the variance of the common component, σ_c^2, and the variance of the idiosyncratic component, σ_ε^2, are assumed to be the same in both groups. The pairwise correlation of the characteristics, $Corr(x_{i,1}; x_{i,2})$, is then:

$$\begin{aligned} \rho^{MZ} &= \frac{\sigma_c^2 + \sigma_a^2}{\sigma_c^2 + \sigma_a^2 + \sigma_\varepsilon^2} \text{ for monozygotic twins, and} \\ \rho^{DZ} &= \frac{\sigma_c^2 + \sigma_a^2/2}{\sigma_c^2 + \sigma_a^2 + \sigma_\varepsilon^2} \text{ for dizygotic twins.} \end{aligned}$$

The differences

$$2(\rho^{MZ} - \rho^{DZ}) = \frac{\sigma_a^2}{\sigma_c^2 + \sigma_a^2 + \sigma_\varepsilon^2}, \quad \text{and} \quad 2\rho^{DZ} - \rho^{MZ} = \frac{\sigma_c^2}{\sigma_c^2 + \sigma_a^2 + \sigma_\varepsilon^2}$$

quantify the contributions of the genetic and common components to the cross-sectional variance of the characteristic. We report these quantities in the last two columns of Table A1. The genetic component seems important for most characteristics, including the risky share, financial wealth, education, and income risk. The exceptions are the Sharpe ratio and the correlation between income risk and the risky portfolio return. The estimated contribution of the common component is negative for nine of characteristics, which is due to the fact that $\rho^{DZ} \leq \rho^{MZ}/2$. This observation suggests that the simple ACE decomposition cannot be applied to these variables.

Cross-Sectional Variance of the Risky Share. If investment choices are driven by the genetic makeup of investors, identical twins likely select more similar asset allocations than fraternal twins. We now verify this conjecture by decomposing the cross-sectional variance of the log risky share.

We begin with some definitions. The average variance of the log risky share *within* twin pairs is:

$$\sigma_{wi}^2 = \mathbb{E}\left\{Var\left[\ln(w_{i,j,t})|i\right]\right\}.$$

The variance of the average share *between* pairs is given by:

$$\sigma_{be}^2 = Var(\ln w_{i,t}),$$

where $\ln(w_{i,t}) = [\ln(w_{i,1,t}) + \ln(w_{i,2,t})]/2$. The cross-sectional variance of the log risky share is the sum of the within and between variances:

$$Var[\ln(w_{i,j,t})] = \sigma_{wi}^2 + \sigma_{be}^2. \tag{2.1}$$

The Pearson correlation between twins, $\rho = Corr[\ln(w_{i,1,t}); \ln(w_{i,2,t})]$, satisfies the relation:[3]

$$\rho = \frac{\sigma_{be}^2 - \sigma_{wi}^2}{\sigma_{be}^2 + \sigma_{wi}^2}.$$

Thus, a high pairwise correlation corresponds to a high variance ratio $\sigma_{be}^2/\sigma_{wi}^2$.

We implement this decomposition in the first set of columns of Table A2. The log risky share variance is substantially smaller within pairs of identical twins ($\sigma_{wi}^2 = 38\%$) than within pairs of fraternal twins ($\sigma_{wi}^2 = 48\%$). Consistent with intuition, the variance between pairs is approximately the same in both groups, and equal to $\sigma_{be}^2 \approx 58\%$. The Pearson correlation within a pair is correspondingly twice as high for identical twins ($\rho = 21\%$) as for fraternal twins ($\rho = 10\%$). The same conclusion holds with the Spearman rank correlation. Thus, identical twins tend to select more similar risky shares than fraternal twins.

These results could be driven by the fact that identical twins have more correlated financial and demographic characteristics than fraternal twins. In the second set of columns, we therefore implement the variance decomposition (2.1) on the residuals obtained from the pooled regression reported in the last column of Table 2. The within variance is again substantially smaller for identical twins ($\sigma_{wi}^2 = 34\%$) than for fraternal twins ($\sigma_{wi}^2 = 42\%$), and the pairwise correlation ρ is more than twice higher in the

[3] We know that

$$\sigma_{wi}^2 = \frac{1}{4}\mathbb{E}\left\{[\ln(w_{i,1}) - \ln(w_{i,2})]^2\right\} = \frac{1-\rho}{2}Var[\ln(w_{i,1})] = \frac{1-\rho}{2}(\sigma_{wi}^2 + \sigma_{be}^2).$$

group of identical twins. The variance decomposition therefore suggests that the asset allocation has a genetic component.

Pooled and Twin Regressions. In Tables A3 and A4, we reestimate the pooled regressions separately on identical and fraternal twins. The estimates are broadly similar in both groups, even though we have only half as many observations for identical twins. Characteristics with significant coefficients in Table 2 of the main text generally have a significant coefficient of the same sign in Tables A3 and A4. The only exceptions are the income risk variables; we attribute this result to their marginal significance for fraternal twins and the smaller number of identical twins. The adjusted R^2 coefficients are similar in both groups and are close to values reported in Table 2.

In Tables A5 and A6, we reestimate the twin difference regressions separately on each twin group. Yearly twin pair fixed effects and characteristics capture a higher fraction of the observed variation of the risky share for identical twins. For instance, the adjusted R^2 coefficients are 31.6% and 21.8%, respectively, for identical and fraternal twins when all characteristics are included, as compared to 23.0% in Table 3 of the main text. When financial wealth is the only observable characteristic, the financial wealth elasticity of the risky share is estimated at 0.18 for identical twins and 0.20 for fraternal twins. When all characteristics are included, the elasticity is instead 0.17 for identical twins and 0.23 for fraternal twins. The financial wealth elasticity of the risky share is close to 0.2 and remains strongly significant in each subsample.

In Table A7, we separately reestimate on each twin group the panel regressions with wealth-dependent elasticity reported in Table 4 of the main text. The elasticity strongly decreases with financial wealth whether one considers identical or fraternal twins.

2.2. Randomly Matched Pairs

In Table A8, we reestimate the twin difference regressions on a group of randomly matched pairs. The results are similar to the pooled cross-sectional regression reported in Table 2. In particular, the income risk and education variables have significant coefficients, in contrast to the insignificant coefficients obtained with actual twins in Table 3.

The R^2 coefficient of the linear panel is lower with randomly matched pairs than with actual twins. The adjusted R^2 is 11.5% with random pairs (compared to 18.0% with actual twins) when financial wealth is the only characteristic, and 17.5% (compared to 23.0% with actual twin pairs) when all characteristics are included. These findings confirm that twin pair fixed effects are important and modify the measured impact of income risk and education on risk-taking.

2.3. Cross-Sectional Variance of the Fixed Effect

The coefficient of determination

$$\rho^2 = \frac{Var(\alpha_{i,t} + \eta f_{i,j,t} + \gamma' x_{i,j,t})}{Var(\ln w_{i,j,t})} \tag{2.2}$$

can be decomposed as:

$$\rho^2 = \omega_\alpha^2 + \omega_c^2 + 2\rho_{c,\alpha}\omega_\alpha\omega_c, \tag{2.3}$$

where $\omega_\alpha^2 = Var(\alpha_{i,t})/Var(\ln w_{i,j,t})$ denotes the contribution of the pair fixed effect to the cross-sectional variance of the risky share, $\omega_c^2 = Var(\eta f_{i,j,t} + \gamma' x_{i,j,t})/Var(\ln w_{i,j,t})$ the contribution of the predictor computed from observable characteristics, and $\rho_{c,\alpha} = Corr(\alpha_{i,t}; \eta f_{i,j,t} + \gamma' x_{i,j,t})$ the correlation between the fixed effect and the predictor.

We estimate $Var(\alpha_{i,t})$ by the pairwise covariance, $Cov(u_{i,1,t}; u_{i,2,t})$, of the residuals $u_{i,j,t} = \ln(w_{i,j,t}) - \eta f_{i,j,t} - \gamma' x_{i,j,t}$. We use sample variances to estimate the variance of the predictor obtained from characteristics, $Var(\eta f_{i,j,t} + \gamma' x_{i,j,t})$, and the variance of the risky share, $Var(\ln w_{ijt})$.

In Table A9, we apply this methodology to all twins, randomly matched pairs, identical twins and fraternal twins. In each panel, each set of two columns corresponds to the regression reported in Table 3 of the main text. That is, the first set of columns corresponds to the pair regression on financial wealth and yearly pair fixed effects. We also consider financial, portfolio and demographic characteristics in the second set of columns, human capital, income and habit in the third set, and municipality and industry dummies in the last set.

For true twin pairs, the fixed effect is an important contributor to the variance of the risky share, with a magnitude comparable to the predicted component obtained from characteristics. The contribution of the fixed effect is more than twice as high for identical twins ($\omega_\alpha^2 = 16\%$) as for fraternal twins ($\omega_\alpha^2 = 7\%$), which confirms the intuition that the twin pair fixed effect has a genetic component.

For random pairs, the contribution of the pair fixed effect is much more modest. The share of the cross-sectional variance explained by the pseudo twin pair fixed effect, ω_α^2, ranges between 2% and 4% across specifications. These estimates of ω_α^2 are of the same order as the contribution of yearly fixed effects and are substantially smaller than the values obtained with properly matched twins. The correlation between the fixed effect and the predicted component, $\rho_{c,\alpha}$, is higher than with actual twin pairs in all specifications. Thus, the main findings of the paper cannot be replicated by random matching.

When industry and business dummies are included in the last set of columns, the large number of new fixed effects creates large changes in the measured values of ω_α^2, ω_c^2 and $\rho_{c,\alpha}$. We attribute these changes to collinearities between the pair fixed effects and the municipality and business dummies. Consistent with this interpretation, the new dummies have almost no impact on the regression coefficients, as can be seen in Table 3 of the main text.

Overall, the results of the variance decomposition show that the twin pair fixed effect explains $\omega_\alpha^2 = 16\%$ of the cross-sectional variance of the risky share for identical twins, and $\omega_\alpha^2 = 7\%$ of the risky share variance for fraternal twins. These estimates are substantial and of the same order of magnitude as the share of the variance explained by financial wealth and other characteristics.

2.4. Yearly Estimates of Twin Difference Regressions

In Table A10, we report year by year estimates of the twin difference regression. The estimates of financial wealth elasticity of the risky share tend to decline over time from 0.282 in 1999 to 0.222 in 2001 and 0.075 in 2002. The relation between risk-taking and financial wealth weakened as the bear market took hold. The financial wealth elasticity of the risky share is nonetheless significantly positive in all years.

2.5. Age

It is sometimes suggested that genetic effects matter less with age. Thus, if individual effects are important, one would expect that they have a stronger impact on the risky share of older households. In Table A11, we reestimate the twin regression on four age groups. The financial wealth elasticity of the risky share remains significantly positive and close to 0.22 for all groups.

The effect of other characteristics is generally robust, but less significant than in Table 3 due to the smaller size of each age group. Leverage, the risky portfolio's Sharpe ratio, family size, income risk, and external and internal habit have a negative impact on the risky share. The systematic risk of the risky portfolio has a positive impact on risk-taking for younger households, and a negative impact for older households. The correlation between the income growth innovation and the risky portfolio return, ρ_h, is significant and positively related to risk-taking in two age groups ($35 - 45$ and above 55) and insignificant in the other two (less than 25 and $45 - 55$). Furthermore, the correlation effect is strongly significant only for the older group.

In Table A12, we estimate a parametric specification that includes age and age squared as explanatory variables of elasticity. The two age coefficients are now insignificant, which suggests that the variations reported in Table A11 are insignificant and that the financial wealth elasticity of the risky share is approximately constant with age. Overall, Tables A11 and A12 show that our main findings are robust across age groups.

2.6. Communication Between Twins

In Table A13, we separately reestimate our regressions on the set of twins who communicate rarely and who set of twins that communicate often. The regression coefficients reported for each group are remarkably similar to the ones reported in Table 3 of the main text. Interestingly, the adjusted R^2 of the twin difference regression is twice as high for twins with infrequent contacts as for twins with frequent contacts, suggesting that communication attenuates the impact of differences in characteristics on the risky share.

2.7. Local Interactions

The asset allocation of a household may be driven not only by its own preferences and characteristics, but also by social interactions with their neighbors, friends and coworkers. For this reason, we have included municipality and business dummies in Tables 2 and 3 in the main text, and have noted that these variables do not impact the main results. We now provide further evidence on the potential role of local interactions.

In Table A14, we compute the cross-sectional variance of the risky share within and between Swedish municipalities. The variance of the risky share (in logs or in levels) within Swedish municipalities is at least 30 times larger than the variance between municipalities. In order to control for differences in characteristics across municipalities, we recompute the variance decomposition for the residual of the regression of the log risky share on characteristics with yearly pair fixed effects reported in the last column of Table A4. The variance of the residual within municipalities is 80 times larger than its variance across municipalities. Thus, local interactions do not appear to be the main drivers of risk-taking.

In Table A15, we reestimate the twin difference regressions by including as controls the average log risky share and the average log financial wealth of households in the same municipality, while keeping municipality fixed effects as controls. The financial wealth elasticity is again estimated at 0.22, and the main results of the main text are unchanged. The municipality log risky share has a positive and significant coefficient of about 0.77. While we leave the full investigation of social interactions in risk-taking for further research, we conclude that social interactions within municipalities do not alter the relation between risk-taking and individual characteristics.

2.8. Pair Fixed Effects and the Financial Wealth Elasticity of the Risky Share

In the main text, we have estimated the equation:

$$\ln(w_{i,j,t}) = \alpha_{i,t} + \eta_{i,t} f_{i,j,t} + \gamma x_{i,j,t} + \varepsilon_{i,j,t},$$

where $\eta_{i,t}$ is a function of financial wealth and other characteristics:

$$\eta_{i,t} = \eta_0 + \eta_1 f_{i,t} + \psi' x_{i,t}.$$

In Table 5, we have reported that the financial wealth elasticity of the risky share $\eta_{i,t}$ decreases with financial wealth and human capital, and increases with habit, real estate wealth and household size. We have not investigated, however, if there is a relation between the elasticity $\eta_{i,t}$ and the overall propensity to take risk, as measured by the fixed effect $\alpha_{i,t}$. For instance, if one interprets $\alpha_{i,t}$ as a measure of risk tolerance, one might ask if there is a relation between risk tolerance and the financial wealth elasticity of the risky share.

In Table A16, we reestimate the twin difference regression when the set of explanatory variables of the elasticity $\eta_{i,t}$ includes the twin pair fixed effect $\alpha_{i,t}$ obtained from the regression reported in Table 5. The coefficient of $\alpha_{i,t}$ is negative and significant. We conclude that households that have a high propensity to take risk tend to have a smaller financial wealth elasticity of the risky share.

2.9. Measurement Error

In Table 5 of the main text, we report OLS estimates of:

$$\Delta_j \ln(w_{i,j,t}) = (\eta_0 + \eta_1 f_{i,t} + \psi' x_{i,t})\Delta_j(f_{i,j,t}) + \gamma' \Delta_j(x_{i,j,t}) + \varepsilon_{i,t}. \tag{2.4}$$

One potential concern is that financial wealth is measured with noise, for instance because of high-frequency variations in cash balances at the end of the year. In Table A17, we control for measurement error in financial wealth by conducting the instrumental variable estimation of (2.4). As in Table 6 of the main text, we use as instruments the twin difference of: passive financial wealth, passive financial wealth interacted with demeaned passive financial wealth, and passive financial wealth interacted with demeaned characteristics.

We report an IV estimate of 0.29 for the average financial wealth elasticity of the risky share, which is higher than the 0.22 estimate obtained by OLS. Thus, as one would expect, measurement error creates a downward bias in the estimate of the average elasticity.

The elasticity is again a decreasing function of financial wealth and an increasing function of internal habit. The corresponding IV regressions coefficients have stronger absolute values and have slightly more significant t-statistics than with OLS. In contrast to Table 5, internal habit remains significant once other characteristics are controlled for. Thus, the main results of the main text are documented even more strongly when we control for measurement error.

2.10. Bank Account Imputation

As explained in Section 1 above, all the results reported in the main text and in Tables A1-A17 are based on the imputation of unreported bank account balances from household characteristics. In order to check the robustness of our results, we now use another approach introduced in the Appendix of CCS (2007), which takes advantage of the comprehensive nature of the data. We estimate the aggregate value of missing bank balances by taking the difference between: (a) the aggregate household deposits reported to the Swedish Central Bank, and (b) the aggregate bank balances in our dataset. The implied average balance is then assigned to each missing observation. In Table A18, we report regression (2) of Table 5 using the constant imputation method. We verify that the financial wealth elasticity of the risky share has a higher average and is still strongly decreasing with financial wealth under this alternative specification. Thus, the bank imputation method does not seem to be a cause for concern.

3. Aggregate Implications

3.1. Methodology

In section 6.2 of the main text, we investigate the impact on aggregate risky wealth of a shock to the cross-sectional distribution of financial wealth:

$$\xi = \frac{\Delta \ln(F_R)}{\Delta \ln(F)}.$$

After the shock, a household's new risky share w'_h is a function of the observed initial share w_h, the exogenous wealth shock Δf_h, and the financial wealth elasticity η_h :

$$\ln(w'_h) = \ln(w_h) + \eta_h \Delta f_h.$$

We consider three specifications for η_h, which we now describe in detail.

- *Heterogeneous CRRA investors.* We set $\eta_h = 0$ for all households h.
- *Constant financial wealth elasticity of the risky share.* We set the elasticity η_h of each household equal to the yearly estimate of η obtained with the twin regression reported in Table A10. In this Appendix, we also consider the constant value $\eta = 0.217$ reported in the last column of Table 3.
- *Linear elasticity $\eta_h(f_h, x_h)$.* For each household, the elasticity $\eta_h(f_h, x_h)$ is set equal to $\eta_0 + \eta_1 f_h + \psi' x_h$, where the coefficients η_0, η_1, ψ are yearly estimates of the twin regression with linear elasticity and all characteristics. In this Appendix, we also use as an alternative the estimates in the second set of columns of Table 5, which are common to all years.

When participation is endogenous, we also need to compute the probability that a household participates in risky asset markets and impute the risky share of new entrants. The unconditional probability of participation is estimated by the logit probability $\Lambda(\delta_t + \theta f_{h,t} + \gamma' x_{h,t})$, where δ_t, θ, γ are the pooled logit coefficients reported in the first set of columns of Table 10. We impute the risky share of a new participant from the pooled regression of the risky share on characteristics estimated in the last set of columns of Table 2.

3.2. Yearly Estimates

In Figures 1 and 2 of the main text, we have considered twenty financial wealth quantiles and computed the aggregate elasticity ξ corresponding to an exogenous wealth shock that affects only households in a quantile. Figures 1 and 2 are based on the 2001 estimates. We now examine the results in other years.

In Figure A1, we compute ξ for each quantile and each year in our sample when the set of participants is fixed. The estimates of ξ vary from year to year because of time variations in the distribution of financial wealth and other characterics. The curves are qualitatively similar in all years. One interesting difference is that in some years, the elasticity ξ is lower for the preferred linear elasticity specification than in the heterogeneous CRRA case when the wealth shock is concentrated in the highest wealth quantiles. We attribute this effect to negative estimates of the linear elasticity $\eta_h(f_h, x_h)$, which suggests that the specification of η_h could be improved.

In Figure A2, we similarly report the elasticity of aggregate risky wealth when participation changes are taken into account. The results are again qualitatively similar to Figure 2 in the main text, except in the highest quantiles.

All elasticities have been so far calculated using yearly estimates of η (constant elasticity case) and η_0, η_1, and ψ (linear elasticity). In Figures A3 and A4, we report the elasticities in each quantile when η, η_0, η_1, and ψ are time-invariant and set equal to the estimates reported in the last columns of Tables 3 and 5. As can be seen, the results are almost identical to the ones reported in Table A2 and A3, which shows that our results are robust to the choice of the estimation method.

3.3. Homogenous Wealth Shock

In Table A19, we report the aggregate elasticity to a homogenous wealth shock $\Delta(f_h) = g$ for each year and imputation method. Aggregate financial wealth is then $F' = e^g F$ and aggregate risky wealth $F'_R = \sum_h F_h w_h e^{(1+\eta_h)g}$.

In the heterogeneous CRRA case, the aggregate elasticity equals unity when the set of participants is fixed. Indeed since $w'_h = w_h$, aggregate risky financial wealth is $F'_R = e^g F_R$, so that $\Delta \ln(F_R) = \Delta \ln(F) = g$. When participation is endogenous, the entry of new participants in response to a positive wealth shock implies that $F'_R > e^g F_R$, and therefore $\xi > 1$. We observe in Table A19 that the deviations from unity are modest and do not exceed a few percentage points.

When the elasticity η is a constant common to all households in all years, aggregate risky wealth is $F'_R = e^{g(1+\eta)} F_R$, and the aggregate elasticity satisfies

$$\xi = 1 + \eta.$$

The aggregate elasticity is slightly in the presence of participation effects. Once again, the deviations of ξ from unity are most pronounced in this case.

Finally in the heterogeneous elasticity case, the aggregate elasticity remains quite close to unity. Thus, the heterogeneous elasticity specification appears to be consistent with the micro evidence, and provides aggregate elasticity estimates that remain close to unity, whether one considers a homogenous shock (Table A19) or concentrated shocks that affect only specific quantiles (Figures 2, A1, and A2).

3.4. Impact of Negative Wealth Shocks

Entry and exit imply that the aggregate elasticity is in principle sensitive to the sign of the financial wealth shock. In Figure 2 of the main text, we have considered the impact of a 10% increase in the wealth of all households in a particular quantile. In Figure A3, we report the equivalent curve for a −10% wealth shock. Figures 2 and A3 are very close. The explanation is that participation turnover is limited and has only a modest impact on the aggregate elasticity.

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TABLE A1. IDENTICAL VS. FRATERNAL TWINS

Summary statistics and ACE decomposition

	IDENTICAL TWINS			FRATERNAL TWINS			ACE DECOMPOSITION	
	Mean	Standard deviation	Pairwise correlation	Mean	Standard deviation	Pairwise correlation	Genetic component	Common component
Financial and Portfolio Characteristics								
Risky share	0.541	0.289	0.266	0.543	0.291	0.149	23.41%	3.23%
Financial wealth ($)	44,730	69,070	0.418	47,611	73,877	0.269	29.89%	11.92%
Real estate wealth ($)	119,553	122,519	0.380	120,371	123,145	0.250	25.98%	12.02%
Leverage ratio	0.859	2.531	0.216	0.742	2.311	0.112	20.70%	0.89%
Total liability ($)	53,732	58,229	0.371	49,542	54,981	0.188	36.63%	0.48%
Private pension premia/income	0.041	0.059	0.178	0.044	0.105	0.041	27.50%	-9.69%
Sharpe ratio of risky portfolio	0.290	0.055	0.002	0.288	0.057	0.001	0.14%	0.02%
Beta of risky portfolio	0.934	0.317	0.177	0.929	0.323	0.073	20.79%	-3.05%
Demographic Characteristics								
High school dummy	0.871	0.335	0.511	0.830	0.375	0.312	39.71%	11.38%
Post-high school dummy	0.398	0.489	0.649	0.360	0.480	0.387	52.38%	12.52%
Number of adults	1.727	0.445	0.280	1.729	0.445	0.089	38.16%	-10.21%
Number of children	1.032	1.086	0.468	0.993	1.116	0.375	18.50%	28.28%
Wealth-weighted gender index	0.530	0.323	0.378	0.548	0.325	0.029	69.71%	-31.92%
Human Capital and Income Risk								
Human capital ($)	810,151	526,763	0.554	737,206	506,458	0.447	21.39%	34.02%
Permanent income risk	-0.001	0.063	0.118	-0.002	0.098	0.013	21.00%	-9.23%
Transitory income risk	0.051	0.250	0.137	0.063	0.405	0.027	22.07%	-8.38%
Correlation of income innovation and portfolio return	0.006	0.311	0.068	-0.007	0.307	0.028	7.96%	-1.20%
Entrepreneur dummy	0.031	0.172	0.347	0.038	0.192	0.050	59.39%	-24.67%
Unemployment dummy	0.089	0.284	0.190	0.081	0.274	0.071	23.77%	-4.76%
Habit								
Internal habit ($)	36,408	16,919	0.418	35,903	16,925	0.235	36.57%	5.21%
External habit ($)	26,358	3,529	0.506	26,044	3,246	0.417	17.76%	32.82%

TABLE A2. IDENTICAL VS. FRATERNAL TWINS

Variance decomposition within and across twin pairs

	Log Risky Share		Residual	
	Identical	**Fraternal**	**Identical**	**Fraternal**
Variance of the Risky Share				
Between pairs	57.46%	58.58%	43.66%	46.22%
Within pairs	37.70%	47.65%	33.82%	42.02%
Total variance	95.16%	106.24%	77.48%	88.24%
Correlation Within Pairs				
Pearson correlation	20.77%	10.29%	12.70%	4.76%
Spearman correlation	27.25%	15.62%	14.00%	5.71%

TABLE A3. IDENTICAL TWINS

Pooled regressions with yearly fixed effects

	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial and Portfolio Characteristics								
Log financial wealth	0.207	25.20	0.211	21.90	0.224	19.50	0.226	19.90
Log real estate wealth			-0.002	-0.69	0.000	-0.09	-0.001	-0.42
Leverage ratio			-0.013	-2.79	-0.012	-2.71	-0.011	-2.40
Log total liability			0.012	3.92	0.012	3.84	0.012	3.81
Private pension premia/income			0.296	1.76	0.343	2.04	0.400	2.41
Sharpe ratio of risky portfolio			0.025	8.50	0.025	8.29	0.024	9.36
Beta of risky portfolio			-0.078	-1.90	-0.072	-1.74	-0.073	-1.73
Demographic Characteristics								
High school dummy			0.116	2.91	0.107	2.66	0.122	3.11
Post-high school dummy			0.059	2.39	0.064	2.51	0.079	2.89
Number of adults			-0.159	-4.82	-0.125	-3.32	-0.130	-3.55
Number of children			-0.063	-5.22	-0.074	-5.45	-0.069	-5.07
Wealth-weighted gender index			0.024	0.62	0.022	0.56	0.009	0.23
Human Capital and Income Risk								
Log human capital					0.056	2.36	0.040	1.70
Permanent income risk					0.081	0.64	0.092	0.73
Transitory income risk					0.002	0.06	-0.002	-0.06
Correlation of income innovation and portfolio return					-0.036	-0.98	-0.024	-0.65
Entrepreneur dummy					-0.052	-0.86	-0.024	-0.37
Unemployment dummy					-0.035	-0.96	-0.035	-0.96
Habit								
Log internal habit					-0.107	-2.60	-0.106	-2.65
Log external habit					-0.129	-1.26	-0.473	-0.82
Municipality and Industry Dummies							Included	
Number of observations	17,054		17,054		17,054		17,054	
Number of twin pairs	2,545		2,545		2,545		2,545	
R^2	9.93%		13.29%		13.51%		18.58%	
Adjusted R^2	9.91%		13.20%		13.39%		17.01%	

TABLE A4. FRATERNAL TWINS

Pooled regressions with yearly fixed effects

	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial and Portfolio Characteristics								
Log financial wealth	0.214	35.40	0.227	33.30	0.237	30.90	0.236	31.10
Log real estate wealth			-0.006	-2.65	-0.005	-2.31	-0.004	-1.81
Leverage ratio			-0.026	-6.11	-0.024	-5.76	-0.023	-5.62
Log total liability			0.021	9.29	0.022	9.79	0.022	9.79
Private pension premia/income			0.083	0.81	0.139	1.14	0.133	1.14
Sharpe ratio of risky portfolio			0.028	14.20	0.028	13.90	0.028	13.90
Beta of risky portfolio			-0.101	-3.47	-0.090	-3.04	-0.093	-3.19
Demographic Characteristics								
High school dummy			0.104	4.05	0.102	3.99	0.102	4.06
Post-high school dummy			0.067	3.99	0.062	3.66	0.058	3.20
Number of adults			-0.230	-10.50	-0.198	-7.89	-0.200	-7.86
Number of children			-0.054	-6.60	-0.045	-4.87	-0.042	-4.43
Wealth-weighted gender index			-0.054	-2.17	-0.042	-1.70	-0.039	-1.58
Human Capital and Income Risk								
Log human capital					0.000	-0.01	-0.004	-0.26
Permanent income risk					-0.158	-1.27	-0.137	-1.11
Transitory income risk					-0.070	-2.28	-0.066	-2.18
Correlation of income innovation and portfolio return					0.093	3.36	0.090	3.20
Entrepreneur dummy					-0.309	-6.25	-0.242	-4.78
Unemployment dummy					-0.102	-3.54	-0.087	-3.09
Habit								
Log internal habit					-0.086	-3.19	-0.095	-3.53
Log external habit					0.008	0.11	-0.333	-0.93
Municipality and Industry Dummies							Included	
Number of observations	38,844		38,844		38,844		38,844	
Number of twin pairs	5,849		5,849		5,849		5,849	
R^2	9.64%		13.98%		14.49%		16.94%	
Adjusted R^2	9.63%		13.95%		14.44%		16.24%	

TABLE A5. IDENTICAL TWINS

Panel regressions with yearly twin pair fixed effects

	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial and Portfolio Characteristics								
Log financial wealth	0.184	12.60	0.185	11.80	0.188	10.70	0.168	9.61
Log real estate wealth			-0.005	-1.20	-0.004	-1.12	-0.006	-1.50
Leverage ratio			-0.026	-2.43	-0.025	-2.40	-0.026	-2.60
Log total liability			0.008	1.88	0.008	1.99	0.006	1.52
Private pension premia/income			0.382	1.59	0.424	1.77	0.458	1.86
Sharpe ratio of risky portfolio			0.027	7.69	0.027	7.59	0.026	7.70
Beta of risky portfolio			-0.150	-2.72	-0.149	-2.69	-0.160	-2.80
Demographic Characteristics								
High school dummy			0.090	1.42	0.096	1.52	0.069	1.04
Post-high school dummy			0.052	1.06	0.048	0.97	0.073	1.48
Number of adults			-0.075	-1.64	-0.060	-1.11	-0.059	-1.11
Number of children			-0.086	-4.38	-0.085	-4.33	-0.097	-4.86
Wealth-weighted gender index			0.042	0.70	0.052	0.87	0.029	0.47
Human Capital and Income Risk								
Log human capital					0.057	1.05	0.037	0.67
Permanent income risk					-0.408	-2.17	-0.335	-1.69
Transitory income risk					-0.001	-0.03	-0.019	-0.44
Correlation of income innovation and portfolio return					0.023	0.48	0.016	0.33
Entrepreneur dummy					-0.157	-1.75	-0.168	-1.68
Unemployment dummy					-0.001	-0.03	-0.015	-0.31
Habit								
Log internal habit					-0.089	-1.45	-0.065	-1.08
Log external habit					0.015	0.10	0.726	0.79
Municipality and Industry Dummies							Included	
Number of observations	8,527		8,527		8,527		8,527	
Number of twin pairs	2,545		2,545		2,545		2,545	
Adjusted R^2 of twin difference regression	4.51%		7.95%		8.01%		13.74%	
R^2 with yearly twin pair fixed effects	62.17%		63.57%		63.62%		67.06%	
Adjusted R^2 with yearly twin pair fixed effects	24.34%		27.03%		27.07%		31.62%	

TABLE A6. FRATERNAL TWINS

Panel regressions with yearly twin pair fixed effects

	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial and Portfolio Characteristics								
Log financial wealth	0.201	21.20	0.220	20.90	0.229	20.90	0.226	20.30
Log real estate wealth			-0.007	-2.29	-0.006	-1.99	-0.005	-1.59
Leverage ratio			-0.038	-4.22	-0.036	-3.97	-0.034	-3.71
Log total liability			0.020	6.41	0.021	6.86	0.021	6.76
Private pension premia/income			0.067	0.74	0.113	1.07	0.092	0.92
Sharpe ratio of risky portfolio			0.030	12.20	0.030	12.10	0.030	12.00
Beta of risky portfolio			-0.116	-2.98	-0.109	-2.77	-0.093	-2.42
Demographic Characteristics								
High school dummy			0.035	0.88	0.019	0.49	0.026	0.65
Post-high school dummy			0.037	1.32	0.028	1.01	0.011	0.38
Number of adults			-0.186	-6.14	-0.136	-3.78	-0.120	-3.27
Number of children			-0.062	-4.55	-0.047	-3.42	-0.046	-3.26
Wealth-weighted gender index			-0.108	-3.13	-0.092	-2.67	-0.081	-2.29
Human Capital and Income Risk								
Log human capital					-0.063	-1.73	-0.069	-1.89
Permanent income risk					-0.084	-0.55	-0.104	-0.69
Transitory income risk					-0.026	-0.77	-0.013	-0.37
Correlation of income innovation and portfolio return					0.093	2.49	0.088	2.33
Entrepreneur dummy					-0.334	-5.58	-0.273	-4.38
Unemployment dummy					-0.091	-2.53	-0.076	-2.16
Habit								
Log internal habit					-0.063	-1.50	-0.073	-1.71
Log external habit					0.047	0.43	-0.607	-0.95
Municipality and Industry Dummies							Included	
Number of observations	19,422		19,422		19,422		19,422	
Number of twin pairs	5,849		5,849		5,849		5,849	
Adjusted R^2 of twin difference regression	5.81%		10.08%		10.63%		12.91%	
R^2 with yearly twin pair fixed effects	57.75%		59.67%		59.92%		61.55%	
Adjusted R^2 with yearly twin pair fixed effects	15.50%		19.28%		19.76%		21.81%	

TABLE A7. IDENTICAL VS. FRATERNAL TWINS

Twin regressions with heterogeneous elasticity

	Identical Twins		Fraternal Twins	
	Estimate	**t-stat**	**Estimate**	**t-stat**
Financial and Portfolio Characteristics				
Log financial wealth				
First quartile	0.141	3.80	0.262	12.50
Second quartile	0.133	4.93	0.191	10.50
Third quartile	0.128	4.54	0.133	7.36
Fourth quartile	0.078	2.93	0.088	4.95
Log real estate wealth	-0.006	-1.43	-0.003	-0.88
Leverage ratio	-0.037	-3.60	-0.043	-4.59
Log total liability	0.002	0.55	0.013	4.14
Private pension premia/income	0.683	2.74	0.225	1.43
Sharpe ratio of risky portfolio	0.027	7.73	0.029	11.80
Beta of risky portfolio	-0.157	-2.74	-0.087	-2.22
Demographic Characteristics				
High school dummy	0.064	0.96	0.026	0.63
Post-high school dummy	0.079	1.59	0.026	0.87
Dummy for unavailable education data	0.740	3.59	0.730	1.80
Number of adults	-0.074	-1.36	-0.143	-3.79
Number of children	-0.096	-4.74	-0.051	-3.57
Wealth-weighted gender index	0.045	0.74	-0.057	-1.59
Human Capital and Income Risk				
Log human capital	0.039	0.71	-0.073	-1.96
Permanent income risk	-0.326	-1.67	-0.064	-0.41
Transitory income risk	0.018	0.40	0.022	0.63
Correlation of income innovation and portfolio return	0.016	0.33	0.100	2.61
Entrepreneur dummy	-0.165	-1.65	-0.243	-3.86
Unemployment dummy	-0.012	-0.23	-0.077	-2.16
Habit				
Log internal habit	0.035	0.60	0.063	1.47
Log external habit	0.512	0.56	-0.656	-1.00
Adjusted R^2 of twin difference regression	12.45%		10.84%	
Number of observations	8,527		19,422	
Number of twin pairs	2,545		5,849	

TABLE A8. RANDOMLY MATCHED PAIRS

Panel regressions with yearly pair fixed effects

	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial and Portfolio Characteristics								
Log financial wealth	0.194	27.90	0.208	26.90	0.216	25.20	0.219	25.20
Log real estate wealth			-0.009	-3.80	-0.008	-3.29	-0.008	-3.30
Leverage ratio			-0.033	-4.85	-0.032	-4.62	-0.031	-4.61
Log total liability			0.021	8.65	0.022	8.74	0.021	8.53
Private pension premia/income			0.055	0.61	0.113	1.07	0.078	0.76
Sharpe ratio of risky portfolio			0.027	13.70	0.026	13.40	0.026	13.30
Beta of risky portfolio			-0.080	-2.66	-0.072	-2.36	-0.077	-2.56
Demographic Characteristics								
High school dummy			0.078	2.81	0.071	2.55	0.063	2.25
Post-high school dummy			0.069	3.55	0.062	3.14	0.075	3.49
Number of adults			-0.212	-8.71	-0.197	-6.90	-0.199	-6.79
Number of children			-0.065	-7.08	-0.065	-6.20	-0.062	-5.90
Wealth-weighted gender index			-0.023	-0.80	-0.019	-0.65	-0.015	-0.50
Human Capital and Income Risk								
Log human capital					0.023	1.24	0.018	0.94
Permanent income risk					-0.191	-1.57	-0.135	-1.11
Transitory income risk					-0.077	-2.26	-0.064	-1.98
Correlation of income innovation and portfolio return					0.066	2.21	0.073	2.45
Entrepreneur dummy					-0.257	-4.95	-0.198	-3.79
Unemployment dummy					-0.082	-2.68	-0.074	-2.44
Habit								
Log internal habit					-0.065	-2.12	-0.070	-2.28
Log external habit					-0.066	-0.84	-0.672	-1.74
Municipality and Industry Dummies							Included	
Number of observations	27,949		27,949		27,949		27,949	
Number of twin pairs	8,394		8,394		8,394		8,394	
Adjusted R^2 of twin difference regression	6.82%		11.11%		11.47%		13.20%	
R^2 with yearly twin pair fixed effects	55.75%		57.78%		57.96%		59.23%	
Adjusted R^2 with yearly twin pair fixed effects	11.49%		15.52%		15.85%		17.50%	

TABLE A9. VARIANCE OF THE TWIN PAIR FIXED EFFECT

A. All Twins and Random Pairs

	Twin Pairs	**Random Pairs**	**Twin Pairs**	**Random Pairs**	**Twin Pairs**	**Random Pairs**	**Twin Pairs**	**Random Pairs**
Variance of:								
Pair fixed effect $\alpha_{i,t}$	0.099	0.033	0.095	0.034	0.097	0.034	0.125	0.049
Predictor computed from observable characteristics	0.071	0.070	0.117	0.110	0.123	0.114	0.161	0.142
Log risky share	1.029	1.029	1.029	1.029	1.029	1.029	1.029	1.029
Contribution to the log risky share variance of:								
Pair fixed effect (ω_α^2)	9.6%	3.2%	9.3%	3.4%	9.4%	3.3%	12.1%	4.8%
Observable characteristics (ω_c^2)	6.9%	6.8%	11.4%	10.7%	12.0%	11.1%	15.7%	13.8%
Pair fixed effect and observable characteristics (Adjusted R^2)	18.0%	11.5%	21.4%	15.5%	21.7%	15.9%	23.0%	17.5%
Implied correlation $\rho_{c,a}$	8.5%	16.4%	3.4%	11.9%	1.5%	11.9%	-17.4%	-6.9%

B. Identical and Fraternal Twins

	Identical Twins	**Fraternal Twins**	**Identical Twins**	**Fraternal Twins**	**Identical Twins**	**Fraternal Twins**	**Identical Twins**	**Fraternal Twins**
Variance of:								
Pair fixed effect $\alpha_{i,t}$	0.152	0.076	0.149	0.073	0.149	0.075	0.315	0.119
Predictor computed from observable characteristics	0.062	0.075	0.101	0.125	0.098	0.135	0.241	0.195
Log risky share	0.952	1.062	0.952	1.062	0.952	1.062	0.952	1.062
Contribution to the log risky share variance of:								
Pair fixed effect (ω_α^2)	16.0%	7.2%	15.6%	6.9%	15.6%	7.0%	33.1%	11.2%
Observable characteristics (ω_c^2)	6.5%	7.0%	10.6%	11.8%	10.3%	12.7%	25.3%	18.4%
Pair fixed effect and observable characteristics (Adjusted R^2)	24.3%	15.5%	27.0%	19.3%	27.1%	19.8%	31.6%	21.8%
Implied correlation $\rho_{c,a}$	9.4%	9.0%	3.0%	3.2%	4.4%	0.2%	-46.3%	-27.1%

TABLE A10. YEARLY TWIN REGRESSIONS

Cross-sectional regressions of log risky share on characteristics and twin pair fixed effects

	1999		2000		2001		2002	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial and Portfolio Characteristics								
Log financial wealth	0.282	23.70	0.247	22.20	0.222	16.70	0.075	4.87
Log real estate wealth	-0.010	-2.87	-0.003	-0.96	0.000	-0.12	-0.007	-1.74
Leverage ratio	-0.045	-4.14	-0.031	-3.30	-0.013	-1.23	-0.041	-3.40
Log total liability	0.026	7.71	0.018	5.38	0.012	3.20	0.012	2.99
Private pension premia/income	0.072	0.48	-0.015	-0.32	0.205	1.15	1.358	4.95
Sharpe ratio of risky portfolio	0.029	11.20	0.027	10.10	0.030	10.30	0.030	9.86
Beta of risky portfolio	0.052	1.13	-0.001	-0.02	-0.066	-1.39	-0.452	-8.89
Demographic Characteristics								
High school dummy	0.052	1.28	0.031	0.81	0.029	0.68	0.039	0.79
Post-high school dummy	0.008	0.24	0.003	0.10	0.070	2.14	0.043	1.18
Number of adults	-0.128	-3.20	-0.119	-3.29	-0.076	-1.87	-0.096	-2.01
Number of children	-0.068	-4.72	-0.069	-5.02	-0.049	-3.34	-0.042	-2.42
Wealth-weighted gender index	-0.023	-0.60	-0.067	-1.83	-0.091	-2.27	-0.037	-0.83
Human Capital and Income Risk								
Log human capital	-0.028	-0.66	-0.042	-1.11	-0.077	-1.85	-0.033	-0.72
Permanent income risk	-0.084	-0.36	-0.174	-1.14	-0.046	-0.26	-0.143	-0.74
Transitory income risk	-0.024	-0.54	-0.046	-1.25	0.013	0.39	0.015	0.29
Correlation of income innovation and portfolio return	-0.019	-0.51	0.070	1.95	0.015	0.39	0.190	4.30
Entrepreneur dummy	-0.290	-4.14	-0.273	-4.47	-0.284	-4.05	-0.187	-2.28
Unemployment dummy	-0.075	-1.71	0.004	0.11	-0.059	-1.40	-0.087	-1.69
Habit								
Log internal habit	-0.120	-2.36	-0.062	-1.48	-0.069	-1.40	0.026	0.45
Log external habit	3.543	11.50	0.851	1.41	0.139	0.43	0.524	1.50
Number of observations	6,859		7,351		7,082		6,657	
Number of twin pairs	13,718		14,702		14,164		13,314	
R^2 of twin difference regression	19.21%		15.71%		13.71%		11.24%	
Adjusted R2 of twin difference regression	15.22%		11.84%		9.58%		6.71%	
R^2 with yearly twin pair fixed effects	64.50%		62.90%		61.66%		60.84%	
Adjusted R^2 with yearly twin pair fixed effects	25.50%		22.40%		19.64%		17.69%	

TABLE A11. AGE

Twin panel regressions within four age groups

	Less than 35		35-45		45-55		Older than 55	
	Estimate	**t-stat**	**Estimate**	**t-stat**	**Estimate**	**t-stat**	**Estimate**	**t-stat**
Financial and Portfolio Characteristics								
Log financial wealth	0.159	5.59	0.246	12.60	0.209	14.00	0.176	10.70
Log real estate wealth	-0.003	-0.57	-0.007	-1.54	-0.007	-1.53	0.001	0.11
Leverage ratio	-0.010	-0.86	-0.027	-2.02	-0.047	-3.48	-0.052	-3.05
Log total liability	0.000	-0.02	0.013	2.41	0.023	4.77	0.017	4.52
Private pension premia/income	1.878	3.46	-0.018	-0.35	0.169	0.88	0.328	1.97
Sharpe ratio of risky portfolio	0.021	4.06	0.024	6.08	0.034	10.00	0.030	8.55
Beta of risky portfolio	0.193	2.30	0.005	0.08	-0.151	-2.82	-0.307	-5.35
Demographic Characteristics								
High school dummy	0.230	1.34	0.076	1.04	0.064	1.21	-0.020	-0.36
Post-high school dummy	0.038	0.55	0.014	0.29	0.024	0.56	0.085	1.78
Number of adults	-0.232	-2.54	0.028	0.45	-0.067	-1.29	-0.146	-2.81
Number of children	-0.054	-1.33	-0.106	-4.79	-0.039	-2.30	-0.100	-3.45
Wealth-weighted gender index	0.140	1.75	-0.184	-2.96	-0.071	-1.36	-0.050	-0.91
Human Capital and Income Risk								
Log human capital	-0.022	-0.29	0.015	0.24	-0.029	-0.55	-0.097	-1.72
Permanent income risk	-0.010	-0.04	-0.194	-1.04	-0.358	-1.75	-0.003	-0.01
Transitory income risk	0.023	0.52	-0.034	-0.99	-0.061	-1.11	0.055	0.61
Correlation of income innovation and portfolio return	-0.132	-1.57	0.114	2.01	-0.030	-0.60	0.151	2.62
Entrepreneur dummy	-0.311	-1.49	-0.224	-2.53	-0.263	-2.82	-0.237	-2.76
Unemployment dummy	0.004	0.06	0.008	0.15	-0.133	-2.51	-0.073	-1.31
Habit								
Log internal habit	0.183	1.97	-0.127	-2.01	-0.126	-2.16	-0.004	-0.06
Log external habit	3.068	1.34	1.933	1.73	-1.185	-1.65	-2.732	-3.00
Number of observations	3,282		6,694		9,788		8,185	
Number of twin pairs	1,311		2,471		3,533		2,954	
R^2 of twin difference regression	22.05%		19.24%		17.75%		18.29%	
Adjusted R^2 of twin difference regression	15.11%		15.34%		14.98%		14.93%	

TABLE A12. RELATION BETWEEN ELASTICITY AND AGE

Twin regression on age squared interacted with financial wealth

	Regression (2)			
	Direct Effect		Interacted	
	Estimate	t-stat	Estimate	t-stat
Financial and Portfolio Characteristics				
Log financial wealth	0.215	23.70	-0.083	-8.61
Log real estate wealth	-0.003	-1.17	0.007	2.82
Leverage ratio	-0.012	-1.32	0.011	1.91
Log total liability	0.013	5.05	0.004	1.40
Private pension premia/income	0.302	2.82	-0.267	-2.41
Sharpe ratio of risky portfolio	0.028	14.00	-0.003	-1.61
Beta of risky portfolio	-0.120	-3.76	-0.045	-1.38
Demographic Characteristics				
High school dummy	0.032	0.94	0.029	1.02
Post-high school dummy	0.021	0.83	-0.018	-0.84
Age			-0.003	-0.33
Age squared			0.000	0.60
Number of adults	-0.127	-4.11	0.125	3.79
Number of children	-0.076	-6.51	0.070	6.27
Wealth-weighted gender index	-0.031	-1.00	0.048	1.46
Human Capital and Income Risk				
Log human capital	-0.045	-1.44	-0.011	-0.36
Permanent income risk	-0.025	-0.19	-0.235	-1.37
Transitory income risk	0.023	0.71	-0.028	-0.66
Correlation of income innovation and portfolio return	0.055	1.83	0.071	2.03
Entrepreneur dummy	-0.238	-4.49	-0.045	-0.90
Unemployment dummy	-0.042	-1.45	0.024	0.74
Habit				
Log internal habit	0.010	0.27	0.003	0.09
Log external habit	-0.381	-0.72	-0.068	-0.84
Adjusted R^2 of twin difference regression	12.90%			
Number of observations	27,949			
Number of twin pairs	8,394			

TABLE A13. COMMUNICATION BETWEEN TWINS

Twin panel regressions on pairs sorted by communication frequency

	Infrequent Communication				Frequent Communication			
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial and Portfolio Characteristics								
Log financial wealth	0.226	9.67			0.198	7.04		
First quartile			0.298	6.58			0.259	5.60
Second quartile			0.316	8.65			0.154	3.33
Third quartile			0.155	4.45			0.206	5.27
Fourth quartile			0.116	3.64			0.138	2.96
Log real estate wealth	-0.004	-0.64	-0.004	-0.59	-0.005	-0.84	-0.005	-0.79
Leverage ratio	-0.024	-1.21	-0.008	-0.38	-0.026	-1.45	-0.020	-1.13
Log total liability	0.028	4.31	0.024	3.69	0.018	2.82	0.017	2.61
Private pension premia/income	-0.027	-0.41	-0.012	-0.18	-0.210	-0.48	-0.146	-0.34
Sharpe ratio of risky portfolio	0.034	6.99	0.034	6.98	0.026	4.47	0.025	4.44
Beta of risky portfolio	-0.154	-1.82	-0.150	-1.78	-0.029	-0.37	-0.022	-0.29
Demographic Characteristics								
High school dummy	-0.053	-0.58	-0.057	-0.62	0.035	0.38	0.034	0.37
Post-high school dummy	0.025	0.41	0.017	0.29	0.118	1.57	0.121	1.62
Number of adults	-0.255	-2.96	-0.292	-3.36	0.148	1.76	0.121	1.42
Number of children	-0.041	-1.42	-0.053	-1.85	-0.083	-2.65	-0.087	-2.76
Wealth-weighted gender index	-0.089	-1.15	-0.095	-1.23	-0.107	-1.27	-0.098	-1.16
Human Capital and Income Risk								
Log human capital	0.008	0.12	-0.005	-0.07	-0.080	-0.98	-0.084	-1.02
Permanent income risk	-0.141	-0.51	-0.052	-0.18	0.443	1.10	0.469	1.13
Transitory income risk	0.049	0.63	0.085	1.10	0.100	0.72	0.116	0.82
Correlation of income innovation and portfolio return	-0.005	-0.06	-0.030	-0.38	0.059	0.74	0.054	0.68
Entrepreneur dummy	-0.302	-2.38	-0.312	-2.43	-0.216	-1.39	-0.213	-1.37
Unemployment dummy	-0.139	-1.80	-0.124	-1.62	-0.021	-0.29	-0.019	-0.27
Habit								
Log internal habit	-0.081	-1.01	-0.008	-0.10	-0.164	-1.80	-0.138	-1.49
Log external habit	0.607	0.57	0.670	0.64	0.749	0.62	0.682	0.55
Adjusted R^2 of twin difference regression	21.81%		22.58%		10.84%		11.04%	
Number of observations	4,441		4,441		4,264		4,264	
Number of twin pairs	1,385		1,385		1,336		1,336	

TABLE A14. LOCAL INTERACTIONS

Variance decomposition within and across municipalities

	Risky share	Log risky share	Residual
Variance between municipalities	0.25%	2.93%	0.49%
Variance within municipalities	7.93%	98.64%	39.84%
Total variance	8.18%	101.57%	40.33%

TABLE A15. LOCAL INTERACTIONS
Impact of municipality average wealth and risky share

	Estimate	t-stat	Estimate	t-stat
Financial and Portfolio Characteristics				
Log financial wealth	0.217	23.10		
First quartile			0.309	17.30
Second quartile			0.232	16.00
Third quartile			0.173	12.30
Fourth quartile			0.147	10.40
Log real estate wealth	-0.005	-1.96	-0.004	-1.63
Leverage ratio	-0.031	-4.45	-0.019	-2.66
Log total liability	0.017	6.66	0.015	5.86
Private pension premia/income	0.122	1.18	0.148	1.33
Sharpe ratio of risky portfolio	0.029	14.30	0.028	14.20
Beta of risky portfolio	-0.114	-3.55	-0.108	-3.37
Demographic Characteristics				
High school dummy	0.038	1.10	0.033	0.95
Post-high school dummy	0.032	1.29	0.029	1.16
Number of adults	-0.103	-3.35	-0.134	-4.36
Number of children	-0.057	-4.95	-0.065	-5.61
Wealth-weighted gender index	-0.054	-1.76	-0.048	-1.56
Human Capital and Income Risk				
Log human capital	-0.045	-1.48	-0.047	-1.54
Permanent income risk	-0.120	-0.93	-0.108	-0.82
Transitory income risk	-0.012	-0.40	0.002	0.08
Correlation of income innovation and portfolio return	0.068	2.26	0.062	2.08
Entrepreneur dummy	-0.251	-4.71	-0.248	-4.65
Unemployment dummy	-0.057	-1.96	-0.050	-1.73
Habit				
Log internal habit	-0.067	-1.88	-0.028	-0.80
Log external habit	-0.402	-0.74	-0.402	-0.74
Local Interactions				
Average log risky share in municipality	0.769	2.72	0.758	2.68
Average log financial wealth in municipality	-0.039	-0.11	-0.038	-0.11
Adjusted R^2 of twin difference regression	11.27%		11.71%	
Number of observations	27,949		27,949	
Number of twin pairs	8,394		8,394	

TABLE A16. IMPACT OF THE PAIR FIXED EFFECT ON THE FINANCIAL WEALTH ELASTICITY OF THE RISKY SHARE

	Direct Effect		Interacted	
	Estimate	t-stat	Estimate	t-stat
Financial and Portfolio Characteristics				
Log financial wealth	0.217	23.70	-0.073	-7.72
Log real estate wealth	-0.003	-1.14	0.008	2.82
Leverage ratio	-0.013	-1.36	0.010	1.88
Log total liability	0.013	5.19	0.004	1.43
Private pension premia/income	0.287	2.67	-0.258	-2.32
Sharpe ratio of risky portfolio	0.028	13.80	-0.004	-1.97
Beta of risky portfolio	-0.109	-3.46	-0.043	-1.38
Yearly twin pair fixed effect			-0.091	-4.33
Demographic Characteristics				
High school dummy	0.032	0.95	0.025	0.92
Post-high school dummy	0.021	0.84	-0.012	-0.58
Number of adults	-0.122	-3.96	0.126	3.82
Number of children	-0.074	-6.41	0.065	5.98
Wealth-weighted gender index	-0.032	-1.03	0.057	1.73
Human Capital and Income Risk				
Log human capital	-0.036	-1.18	-0.045	-2.85
Permanent income risk	-0.020	-0.15	-0.149	-0.83
Transitory income risk	0.019	0.58	-0.022	-0.51
Correlation of income innovation and portfolio return	0.059	1.97	0.069	1.98
Entrepreneur dummy	-0.244	-4.60	-0.041	-0.82
Unemployment dummy	-0.045	-1.56	0.021	0.64
Habit				
Log internal habit	-0.004	-0.12	0.020	0.67
Log external habit	-0.364	-0.69	-0.061	-0.77
Adjusted R^2 of twin difference regression	13.45%			
Number of observations	27,949			
Number of twin pairs	8,394			

TABLE A17. IV ESTIMATION OF THE LINEAR ELASTICITY SPECIFICATION

Yearly twin pair fixed effects

	Regression (1)				Regression (2)			
	Direct Effect		Interacted		Direct Effect		Interacted	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Financial and Portfolio Characteristics								
Log financial wealth	0.288	24.40	-0.138	-10.50	0.287	24.70	-0.133	-9.41
Log real estate wealth	-0.001	-0.40			0.000	-0.06	0.005	1.62
Leverage ratio	0.022	2.33			0.023	2.10	0.003	0.91
Log total liability	0.016	5.86			0.015	5.18	0.005	1.40
Private pension premia/income	0.029	0.39			0.219	1.76	-0.270	-2.30
Sharpe ratio of risky portfolio	0.027	11.90			0.027	11.60	-0.005	-1.85
Beta of risky portfolio	-0.185	-5.03			-0.197	-5.39	-0.056	-1.31
Demographic Characteristics								
High school dummy	0.025	0.69			0.026	0.69	0.046	1.35
Post-high school dummy	0.013	0.51			0.011	0.40	-0.024	-0.91
Number of adults	-0.126	-3.63			-0.124	-3.59	0.064	1.56
Number of children	-0.067	-5.31			-0.077	-6.00	0.048	3.64
Wealth-weighted gender index	-0.066	-2.00			-0.056	-1.67	0.058	1.44
Human Capital and Income Risk								
Log human capital	-0.050	-1.49			-0.044	-1.32	-0.022	-1.42
Permanent income risk	-0.098	-0.67			-0.047	-0.28	0.007	0.03
Transitory income risk	0.002	0.07			-0.001	-0.01	0.055	0.84
Correlation of income innovation and portfolio return	0.060	1.83			0.054	1.64	0.052	1.20
Entrepreneur dummy	-0.249	-4.08			-0.245	-3.95	0.014	0.21
Unemployment dummy	-0.042	-1.32			-0.031	-0.98	0.031	0.71
Habit								
Log internal habit	-0.113	-2.71	0.182	6.00	-0.092	-2.22	0.108	2.76
Log external habit	-1.025	-0.99			-1.077	-1.04	-0.043	-0.43
Adjusted R^2 of twin difference regression	9.13%				9.89%			
Number of observations	19,418				19,418			
Number of twin pairs	8,394				8,394			

TABLE A18. IMPACT OF CONSTANT BANK IMPUTATION

Panel regression with yearly twin pair fixed effects

	Regression (2)			
	Direct Effect		Interacted	
	Estimate	t-stat	Estimate	t-stat
Financial and Portfolio Characteristics				
Log financial wealth	0.322	35.10	-0.220	-18.70
Log real estate wealth	-0.003	-1.37	0.004	1.45
Leverage ratio	-0.056	-6.52	0.006	0.73
Log total liability	0.011	4.32	0.003	1.12
Private pension premia/income	0.331	3.24	-0.355	-4.48
Sharpe ratio of risky portfolio	0.024	12.40	-0.006	-2.85
Beta of risky portfolio	-0.128	-4.31	-0.048	-1.38
Demographic Characteristics				
High school dummy	0.027	0.86	0.020	0.68
Post-high school dummy	0.025	1.13	-0.050	-2.37
Number of adults	0.036	1.29	0.089	2.58
Number of children	0.071	6.91	0.057	5.27
Wealth-weighted gender index	0.011	0.37	0.054	1.52
Human Capital and Income Risk				
Log human capital	-0.031	-1.11	-0.051	-3.03
Permanent income risk	0.087	0.68	-0.161	-0.96
Transitory income risk	0.051	1.80	0.007	0.17
Correlation of income innovation and portfolio return	0.050	1.87	0.030	0.84
Entrepreneur dummy	-0.129	-2.90	-0.021	-0.43
Unemployment dummy	-0.079	-3.00	0.034	0.99
Habit				
Log internal habit	0.090	2.74	0.071	2.38
Log external habit	-0.249	-0.59	-0.032	-0.41
Adjusted R^2 of twin difference regression	24.70%			
Number of observations	27,949			
Number of twin pairs	8,394			

TABLE A19. ELASTICITY OF AGGREGATE RISKY FINANCIAL WEALTH

Homogenous Wealth Shock

A. Yearly Estimates of the Elasticity Specification

	Fixed Set of Participants				With Entry and Exit			
	1999	**2000**	**2001**	**2002**	**1999**	**2000**	**2001**	**2002**
CRRA representative investor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heterogeneous CRRA	1.000	1.000	1.000	1.000	1.026	1.020	1.023	1.031
Constant financial wealth elasticity of the risky share	1.282	1.247	1.222	1.075	1.313	1.269	1.246	1.108
Linear financial wealth elasticity of the risky share	0.975	1.011	1.069	0.929	1.001	1.030	1.092	0.958

B. Panel Estimates of the Elasticity Specification

	Fixed Set of Participants				With Entry and Exit			
	1999	**2000**	**2001**	**2002**	**1999**	**2000**	**2001**	**2002**
CRRA representative investor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heterogeneous CRRA	1.000	1.000	1.000	1.000	1.025	1.016	1.023	1.039
Constant financial wealth elasticity of the risky share	1.217	1.217	1.217	1.217	1.245	1.236	1.242	1.259
Linear financial wealth elasticity of the risky share	0.997	1.004	1.021	1.035	1.022	1.020	1.044	1.072

FIGURE A1. ELASTICITY OF AGGREGATE RISKY FINANCIAL WEALTH

Fixed set of participants

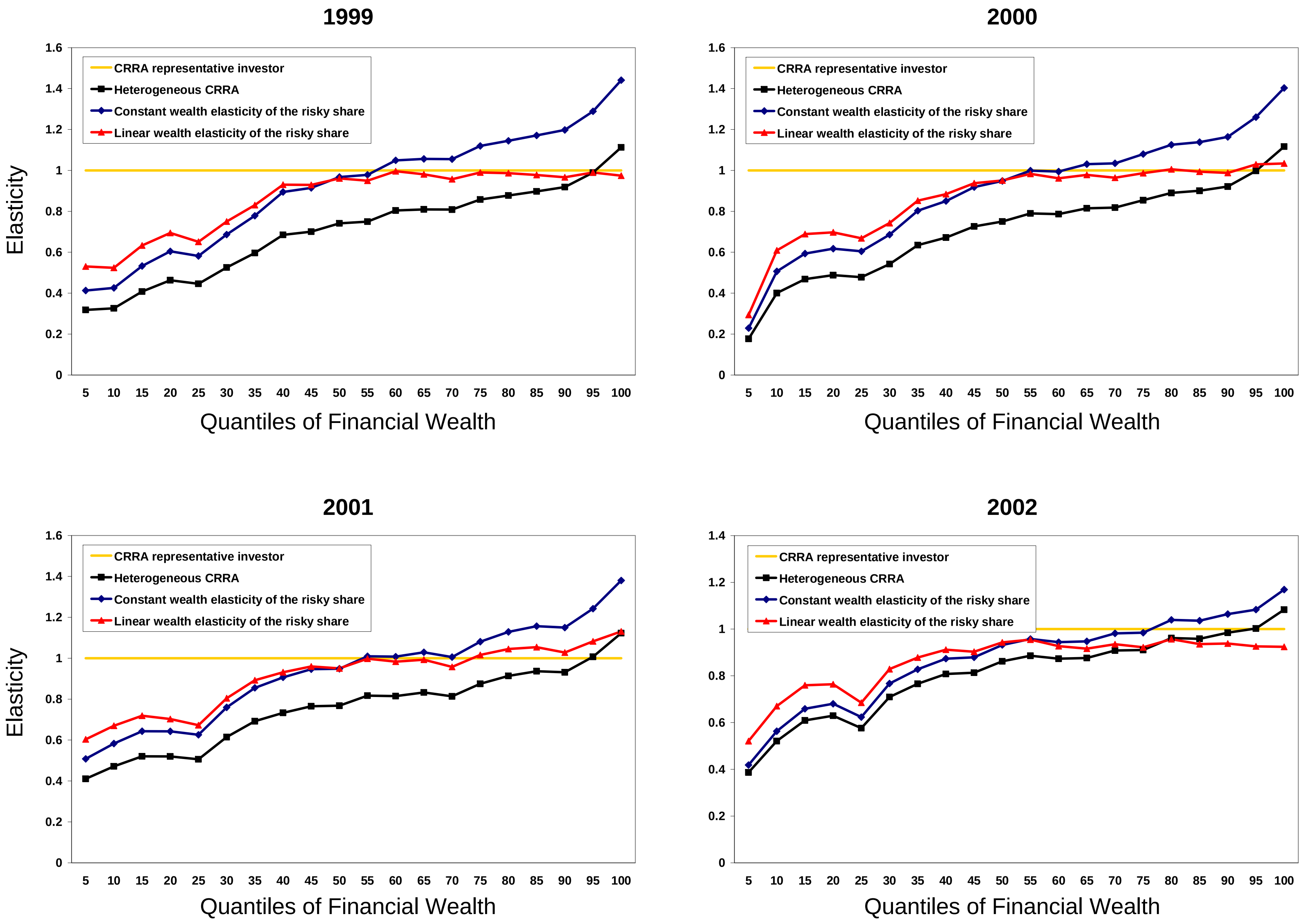

FIGURE A2. ELASTICITY OF AGGREGATE RISKY FINANCIAL WEALTH
With entry

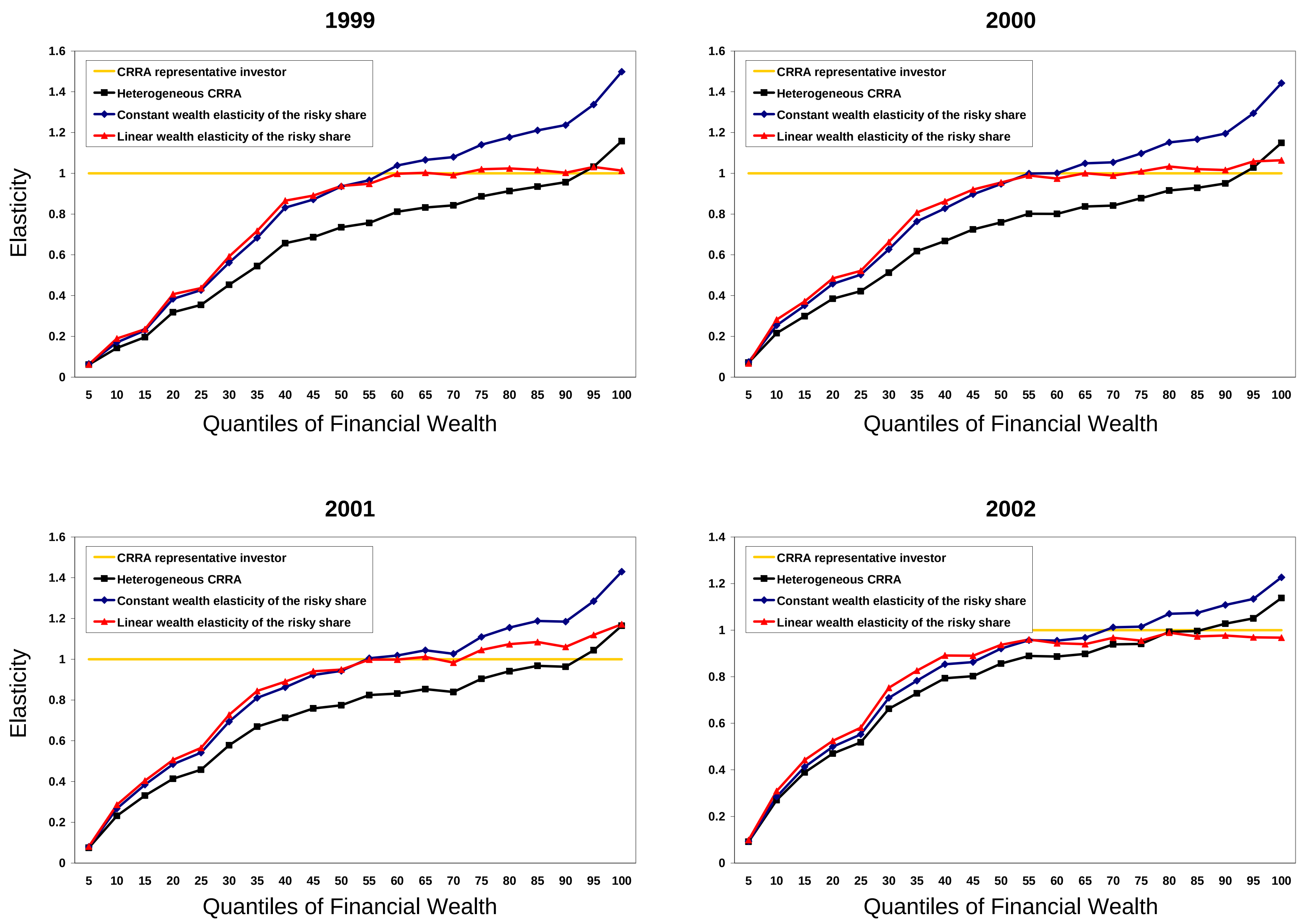

FIGURE A3. ELASTICITY OF AGGREGATE RISKY FINANCIAL WEALTH

Fixed set of participants – Panel estimates of the linear elasticity coefficients

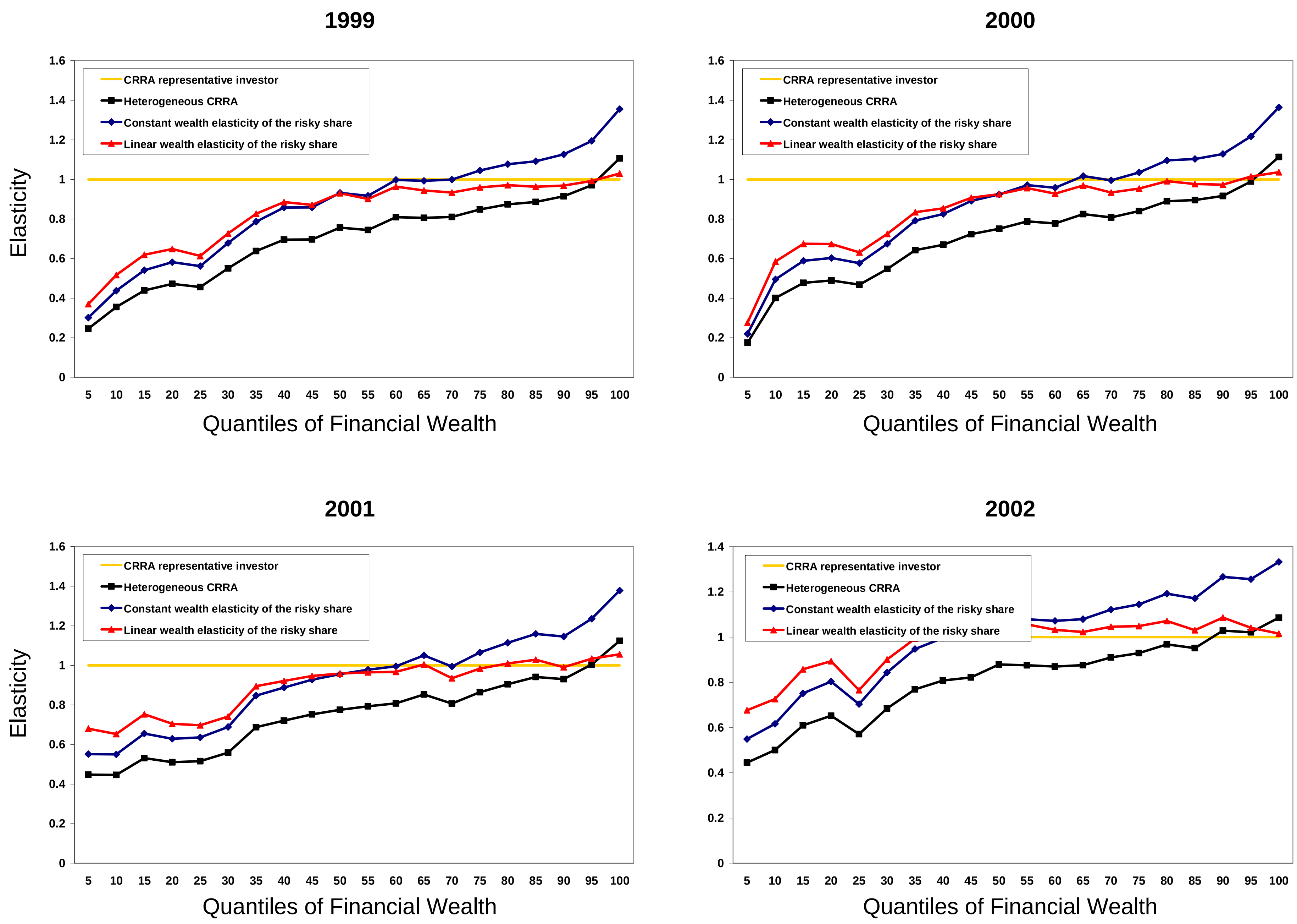

FIGURE A4. ELASTICITY OF AGGREGATE RISKY FINANCIAL WEALTH
With entry – Panel estimates of the linear elasticity coefficients

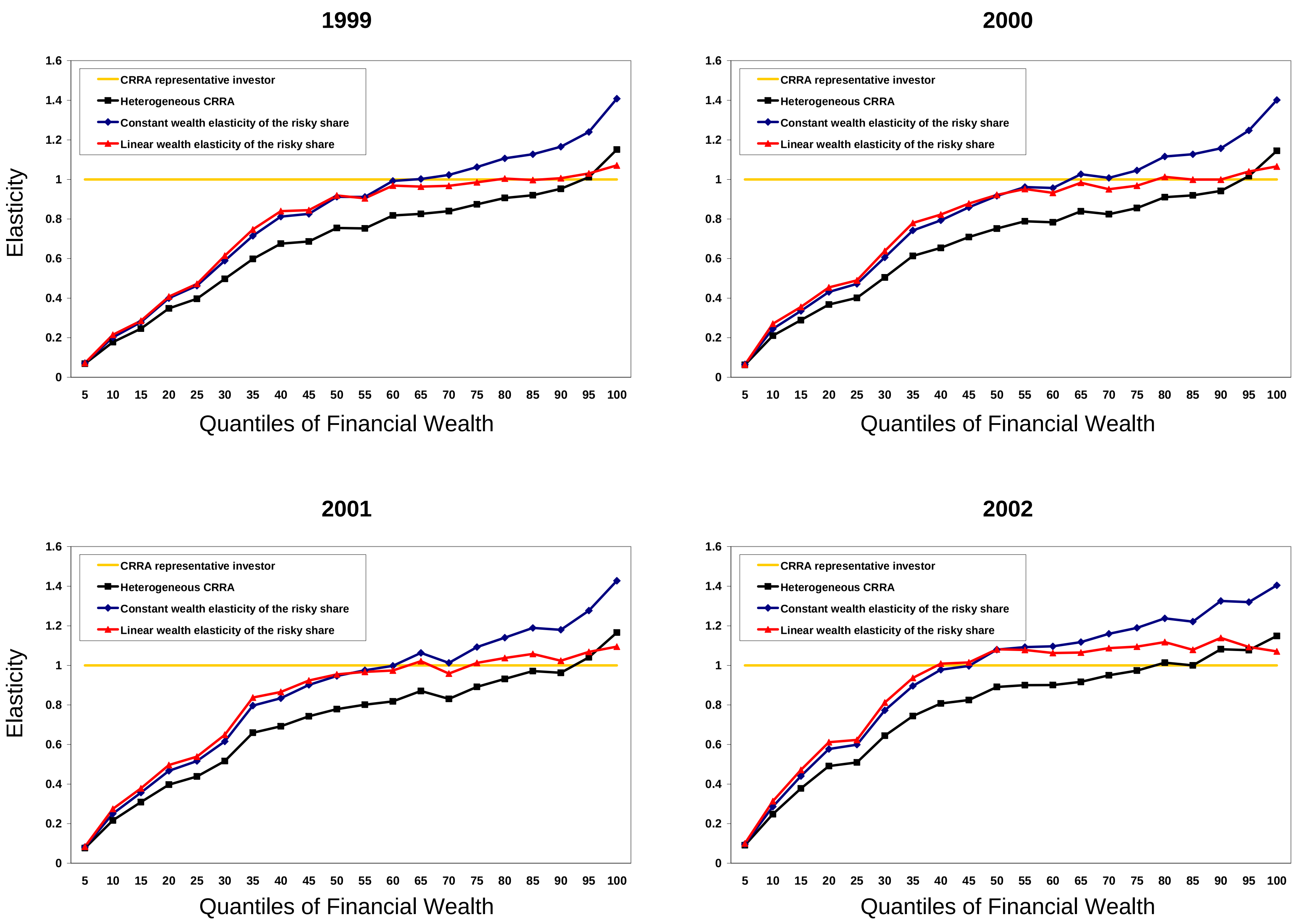

FIGURE A5. AGGREGATE ELASTICITY IN RESPONSE TO A NEGATIVE WEALTH SHOCK
With exit (2001)