

Online Appendix: Household Portfolio Choice and Retirement

Jawad M. Addoum
Cornell University*

*Cornell University, Charles H. Dyson School of Applied Economics and Management, 301B Warren Hall, Ithaca, NY 14853; Phone: 607-254-8308; Email: jaddoum@cornell.edu

A Proof of Proposition 1

For $t \in \{0, 1, 2\}$, I first note that the household's budget constraint can be rewritten as

$$C_t = W_t - W_{t+1}R_{p,t+1}^{-1}. \quad (1)$$

Then, the first order condition with respect to C_t is given by

$$A_t C_t^{-\gamma_t} + E_t \left[-\delta C_{t+1}^{-\gamma_{t+1}} A_{t+1} R_{p,t+1} \right] = 0 \quad (2)$$

Since the first order condition holds for all assets, I replace the portfolio return, $R_{p,t+1}$, in equation (2) with the risky asset return, R_{t+1} . After multiplying both sides by $C_t^{\gamma_{t+1}}$ and rearranging, I obtain

$$C_t^{\gamma_t} C_t^{-\gamma_{t+1}} E_t \left[-\delta \frac{A_{t+1}}{A_t} \left(\frac{C_{t+1}}{C_t} \right)^{-\gamma_{t+1}} R_{t+1} \right] = 1 \quad (3)$$

Taking the logarithm of both sides of this equation, I obtain

$$(\gamma_t - \gamma_{t+1}) c_t + \log \delta + \log A_{t+1} - \log A_t + \log E_t \left[\left(\frac{C_{t+1}}{C_t} \right)^{-\gamma_{t+1}} R_{t+1} \right] = 0, \quad (4)$$

where lowercase variables denote the log of their uppercase counterparts. Under the assumption that asset returns and consumption growth are jointly lognormal, this can be rewritten as

$$(\gamma_t - \gamma_{t+1}) c_t + \log \delta + \log A_{t+1} - \log A_t - \gamma_{t+1} E_t [\Delta c_{t+1}] + E_t r_{t+1} + \frac{\gamma_{t+1}^2}{2} \sigma_{ct}^2 + \frac{1}{2} \sigma_t^2 - \gamma_{t+1} Cov_t(r_{t+1}, \Delta c_{t+1}) = 0. \quad (5)$$

Similarly, I can replace the portfolio return, $R_{p,t+1}$, in equation (2) with the riskless asset return, $R_{f,t+1}$. After taking logarithms and rearranging, the log first order condition of the riskless asset

is as follows:

$$(\gamma_t - \gamma_{t+1})c_t + \log \delta + \log A_{t+1} - \log A_t - \gamma_{t+1}E_t[\Delta c_{t+1}] + \frac{\gamma_{t+1}^2}{2}\sigma_{ct}^2 + r_{f,t+1} = 0. \quad (6)$$

Subtracting equation (6) from (5), we have

$$E_tr_{t+1} + \frac{1}{2}\sigma_t^2 - \gamma_{t+1}Cov_t(r_{t+1}, \Delta c_{t+1}) - r_{f,t+1}. \quad (7)$$

Noting that $Cov_t(r_{t+1}, \Delta c_{t+1}) = \alpha_t \sigma_t^2$, we can substitute and rearrange to obtain the optimal portfolio weight for the risky asset:

$$\alpha_t = \frac{E_tr_{t+1} - r_{f,t+1} + \sigma_t^2/2}{\gamma_{t+1}\sigma_t^2}. \quad (8)$$

B Proof of Proposition 2

I prove both claims by contradiction. For the first claim, suppose that $\frac{d\gamma_{t+1}}{d\phi_{t+1}} \leq 0$. Then, this implies that $\gamma_1 - \gamma_2 \leq 0$, or, that $\gamma_1 \leq \gamma_2$. But this is a contradiction, since we assumed that $\gamma_1 > \gamma_2$. Therefore, $\frac{d\gamma_{t+1}}{d\phi_{t+1}} > 0$.

For the second claim, suppose that $\frac{d\alpha_t}{d\phi_{t+1}} \geq 0$. Then, this implies that

$$\frac{E_tr_{t+1} - r_{f,t+1} + \sigma_t^2/2}{\gamma_{t+1}^2\sigma_t^2} \frac{d\gamma_{t+1}}{d\phi_{t+1}} \leq 0. \quad (9)$$

Since $E_tr_{t+1} > r_{f,t+1}$, this implies that $\frac{d\gamma_{t+1}}{d\phi_{t+1}} \leq 0$. However, this contradicts the first claim above. Therefore, $\frac{d\alpha_t}{d\phi_{t+1}} < 0$.

C Gender Differences in Risk Aversion

In this section, I verify that, on average, estimates of women’s risk aversion exceed that of men in the HRS sample. The relation between men’s and women’s average risk aversion levels has been studied extensively in the literature.

For example, Hudgens and Fatkin (1985), Levin, Snyder, and Chapman (1988), and Powell and Ansic (1997) conduct psychological experiments examining the role of gender in decision making under risk. Specifically, Hudgens and Fatkin (1985) conduct experiments using military personnel, finding that men take greater risks than women in computer-simulated tasks. Levin, Snyder, and Chapman (1988) study the gambling behavior of a group of student subjects, also finding that males respond more favorably to gambles than females. Powell and Ansic (1997) use computerized laboratory experiments to show that females are more risk averse than males in financial decision environments, irrespective of a range of situational factors.

In the economic literature, several studies use survey data to provide evidence of gender-based differences in risk aversion and risky asset allocations. In particular, Bajtelsmit and Bernasek (1996) and Bajtelsmit and VanDerhei (1997) document that women invest their pension assets more conservatively than men, using a proprietary dataset of self-directed defined contribution (DC) plan participants. Sunden and Surette (1998) document the same relationship using DC plan holdings from the 1992 and 1995 waves of the Survey of Consumer Finances (SCF). Jianakopulos and Bernasek (1998) use data from the 1989 wave of the SCF to show that single women hold less of their financial wealth in risky assets than their male counterparts. Finally, Barsky, Juster, Kimball, and Shapiro (1997) use HRS respondents’ willingness to accept lifetime income gambles to infer risk aversion estimates, and find that women are statistically more risk averse than men, and that this correlates with risky portfolio shares.

Kimball, Sahm, and Shapiro (2008) develop a method for exploiting individuals’ repeated responses over multiple HRS survey waves to eliminate measurement error and allow imputation

of reliable risk aversion estimates for all respondents. Using their risk aversion imputations, I compare the risk aversion of men and women by estimating regressions of the following form:

$$\gamma_{i,t} = \alpha + \beta (Female) + \Gamma X_{i,t} + \varepsilon_{i,t}, \quad (10)$$

where γ is the estimated risk aversion for individual i at time t , *Female* is an indicator equal to 1 if individual i is a female and 0 otherwise, and $X_{i,t}$ is a vector of control variables. If females are more risk averse than males in the HRS sample, then β should be significantly negative.

Table A6, Panel A presents estimates from running specifications of the form outlined in equation (10). In column 1, I estimate a specification with no control variables. In column 2, I follow Barsky, Juster, Kimball, and Shapiro (1997) in adding a standard set of control variables, including labor income, net worth, pension income, age, years of formal education, and whether the respondent is married. Finally, in column 3, I further add religion and race fixed-effects. To account for within-household serial correlation in the error term, I cluster standard errors at the household-level.

Across all specifications in Table A6, Panel A, there is a strong statistical relationship between the *Female* indicator and estimated risk aversion, suggesting that female HRS respondents are more risk averse than their male counterparts. Specifically, I find that estimates of β , the difference in risk aversion between females and males, range from 0.315 to 0.332, and are statistically significant at the 1% level. Overall, these estimates confirm the findings of prior studies in psychology and economics, that, on average, females exhibit higher levels of risk aversion than males.

To verify the link between risk aversion and stock allocations in the HRS, I present estimates of pooled Tobit specifications in Table A6, Panel B. Specifically, I regress observed stock allocations on the estimated risk aversion of the main respondent. I include the same set of control variables as in Table A6, Panel A, with the addition of a set of time fixed-effects to account for

common variation in stock allocations across households.

The estimates presented in Table A6, Panel B indicate a strong negative relationship between stock allocations and risk aversion. Across all control specifications, the estimated risk aversion coefficient estimates are significant at the 1% level. The estimates are also economically significant. For example, the estimate of -1.090 in specification (1) indicates that, on average, the allocation to stocks decrease by about 1.1% for every one unit increase in a respondent’s risk aversion.¹

Overall, the results in this section establish that women’s risk aversion exceeds that of men, and that risk aversion is an important determinant of stock allocations in the HRS sample.

D Sample Attrition and Compositional Changes

In this section, I analyze the potential problems related to attrition and compositional changes in the estimation sample. In particular, Poterba, Venti, and Wise (2011) document a wealth-related differential in mortality among couples, whereby less wealthy households in a given cohort have higher mortality rates. This presents a potential sample bias, in that as researchers follow households over time, surviving households are more likely to be those who were the wealthiest in their cohort.

As a first step, I examine the drivers of attrition in the estimation sample. Among the main sample restrictions (i.e., positive wealth and positive stockholdings), I find that the positive wealth restriction is not the main driver of attrition. In fact, I find that relaxing the positive

¹To compare this magnitude to that implied by standard portfolio theory, I consider the optimal portfolio choice of an agent with power utility (e.g., Campbell and Viceira, 2001). This setup corresponds to that in Section 2 with ϕ equal to either 0 or 1. Consider a calibration with an expected annual equity risk premium of 6% (e.g, Mehra and Prescott, 1985) and annual stock market index volatility of 19% (e.g, Bansal and Yaron, 2004). Under this calibration, the shift in optimal portfolio allocation has an average magnitude of about 3.4% when risk aversion is perturbed by one unit relative to the HRS sample mean of 8. This is significantly larger than the 1.1% estimate in the data, suggesting that measurement error in the risk aversion estimates generates an attenuation bias. This is not surprising, since the risk aversion estimates are based on relatively coarse income gamble questions. Despite this measurement error, the risk aversion estimates do correspond to cross-sectional variation in stock allocations.

wealth restriction adds only an additional 32 observations to the 24,338 observations in the main sample. Further, this has no effect on the main results. Instead, I find that the main driver of attrition in the sample is the positive stockholding requirement, since my analysis focuses on stock market participants.

Next, I conduct several tests to assess the potential bias induced by attrition related to the stock participation requirement. Following Michaud, Kapteyn, Smith, and van Soest (2011), I define an indicator variable for temporary attrition from the sample. In column 1 of Table A7, I test whether the risky asset share predicts attrition using a logit model. The estimates indicate that the risky asset share is strongly negatively correlated with attrition from the sample. All else equal, those households with very low risky asset shares (i.e., close to zero) are more likely to leave the sample. This is not surprising, since the positive stockholding restriction is the main driver of attrition in the sample.

In column 2 of Table A7, I examine the sensitivity of the main difference-in-differences estimate conditional on a sample of those who attrit from the sample at least once vs. those who remain in the sample after entering. I find that the main result is economically and statistically significant in both subsamples. Further, I find that the difference in the coefficient of interest between the two groups is statistically indistinguishable from zero (F -statistic = 0.83, p -value = 0.363).

Finally, In column 3, I run the main estimation on a panel balanced in event-time before and after retirement. Further, to allay concerns of the mortality selection effect associated with those who transition from married couples to single widow(er)s being socioeconomically different, I restrict the sample to the single never married, married never single subsample. I find that the main result holds in this balanced panel that is free of concerns due to attrition and compositional changes. Specifically, I find that the difference-in-differences coefficient remains economically and statistically significant, with a coefficient of -7.495 (t -statistic = -2.66). Further, I report dynamic

summary statistics for this subsample that is free of attrition and compositional changes. These additional statistics, reported in Table A8, are qualitatively similar to those in Table 2, further suggesting that the main results in the paper are not driven by biases due to attrition and compositional changes in the sample.

E Addressing Potential Measurement Error

Though its longitudinal nature and focus on the population over the age of 50 make the HRS an ideal setting for studying households’ portfolio choices through the retirement transition, the dataset is not without its drawbacks. First, an implicit part of households’ financial portfolios is the present value of the stream of Social Security payments they are entitled to in the future. Second, though the total balances of households’ IRA and DC retirement accounts are available in the HRS, the allocations of DC balances are not reported. Further, the allocations of IRA accounts are not known in waves prior to 2006. The absence of measures accounting for both of these asset types in the definition of the financial portfolio generates the potential for measurement error and associated estimation biases. In this subsection, I investigate how accounting for Social Security, IRA, and DC wealth affects the baseline results.

E.1. Calculating Social Security Wealth

To calculate Social Security wealth, I use the HRS “Prospective Social Security Wealth Measures of Pre-Retirees” dataset. This public dataset uses restricted administrative records from the Social Security Administration to calculate Social Security wealth for the subsample of 1992, 1998, and 2004 HRS respondents who were not yet claiming Social Security payments. Further, the dataset contains three measures of implicit Social Security wealth based on the age of the respondent when first claiming payments: early retirement claim age of 62, full retirement age of between 65 and 67, and late retirement claim age of 70. Finally, the calculated Social Security

wealth measures take into account both spousal and survivor benefits, using actuarial mortality rates for spouses.

For those respondents with Social Security wealth values in multiple waves (for example, in 1992 and 1998, 1998 and 2004, or in all three waves), I calculate, for each assumed claim age, an individual-specific implicit growth rate between the waves. Using this implicit growth rate, I then calculate and fill in implied Social Security wealth values for intermediate observation years. I also use these implicit growth rates to extrapolate Social Security wealth values past the last-observed wave (2000 and on for those where the last observed wealth measure was in 1998, and 2006 and on where the last observed wealth measure was in 2004). For those respondents for whom Social Security wealth is observed in only a single wave, I extrapolate using the average individual-specific implied growth rates of all respondents of the same gender and marital status for whom growth rates could be calculated.

Then, for each period in which an individual with Social Security wealth data has not yet claimed benefits, I calculate the value of their Social Security wealth to be the maximum among the early, full, and late retirement age values. During the first period when an individual claims benefits, I calculate the implied Social Security wealth at the claim age by interpolating the early, full, and late retirement age values from the previous observation, inflating this value using historical Social Security Cost-of-Living Adjustment figures, and subtracting the cumulative value of benefit payments received to date. For each period thereafter, I carry the inflated values from the previous period forward, subtracting the cumulative value of benefit payments between waves. I then inflate all wealth values to year-2012 dollars using CPI data from the Bureau of Labor Statistics. Finally, the Social Security wealth for a couple is calculated as the sum of the calculated wealth for each member of the couple. This process yields Social Security wealth data for 4,637 households, totaling 15,640 observations.²

²This sample is comprised of 9,967 observations on 2,820 couples and 5,673 observations on 1,998 singles.

E.2. Incorporating Social Security Wealth

To incorporate Social Security wealth, I redefine the financial portfolio to include both explicit holdings in stocks, bonds, and cash, as well as implicit non-risky Social Security wealth. I then redefine the share of risky assets in the household portfolio, w_{risky} , to be the proportion of risky assets in the comprehensive financial portfolio. Column 1 of Table A9 presents the results of estimating the baseline difference-in-differences regression outlined in equation (7) on the sample of respondents with imputed Social Security wealth. The estimates in column 1 show that incorporating Social Security wealth into the financial portfolio does not explain the dichotomy between singles' and couples' post-retirement portfolio rebalancing decisions. Singles continue to maintain a constant level of risky assets in their financial portfolios, whereas couples significantly decrease their risky asset shares post-retirement. Importantly, the difference-in-differences estimates continue to be economically large when accounting for Social Security, representing about 6% of the total financial portfolio.

E.3. Controlling for IRA and DC Wealth

Next, I investigate how controlling for wealth held in IRA and DC retirement accounts affects the baseline results. As previously noted, the HRS only provides data on how IRA assets are allocated beginning in 2006, and allocation information is entirely unavailable for DC assets. Thus, it is not possible to construct a panel of household-level stock allocations that includes IRA and DC assets. Instead, I control for potential measurement error by re-estimating the baseline specification on subsamples of households who report IRA and DC wealth equal to zero. To incorporate wealth held in the DC plans sponsored by respondents' current and former employers, I use the HRS Pension Wealth Data files of Gustman, Steinmeier, and Tabatabai (2014). These data are constructed by identifying both active and dormant DC plans through repeated interviews asking respondents about retirement plans in current and previous jobs.

In column 2 of Table A9, I restrict the sample to include only observations for households reporting zero IRA balances in a particular wave. In column 3, I do the same for households reporting zero DC balances. The results in both columns echo the baseline estimates. In both cases, singles’ stock allocations remain relatively unchanged through the retirement transition. In contrast, couples exhibit reallocations away from stocks that are statistically significant at the 1% level.³ Overall, the results of this section suggest that the baseline estimates are not driven by measurement error related to Social Security, IRA, and DC wealth.

F Falsification Test

As a second test of the retirement event as the driver of the difference between singles’ and couples’ portfolio reallocations, I conduct a formal falsification (or “placebo”) test. Specifically, I randomly reassign retirement dates across households in the sample. I then re-estimate the baseline specification in equation (7), record the coefficient estimates, and repeat this process for each of 1,000 trials. The distribution of coefficients across these trials can inform whether the retirement event is the driver of the difference between couples and singles.

The results of this analysis are presented in Appendix Table A10. For ease of comparison, column 1 presents the point estimates from the baseline specification in equation (7). Column 2 displays the mean point estimates obtained from the 1,000 random retirement reassignment trials. Finally, column 3 shows the difference between the baseline estimates and the mean estimates from the 1,000 random trials, as well as the p -value (in square brackets) obtained by comparing the baseline estimate with the empirical distribution of coefficients obtained from the random trials. All regression specifications include the full set of controls (family labor income, net worth, pension income, number of children, squared age of the head, and out-of-pocket

³In an untabulated test, I simultaneously enforce the zero balance restriction for both IRA and DC accounts. I find results that are qualitatively similar. However, the sample size shrinks to such a large degree that the test lacks statistical power.

healthcare expenditures). However, the coefficients of the control variables are suppressed in order to focus on the coefficients of interest, the retirement and transition indicators for couples and singles.

The estimates in column 3 of Appendix Table A10 indicate that the differences between the baseline and mean estimates under random retirement reassignment are economically large for couples. In contrast, the analogous differences are small for singles. Specifically, the baseline and mean estimates under random retirement reassignment differ by almost 5% for couples versus a difference of only 0.72% among singles. Further, comparing the baseline estimates to the empirical distributions under random retirement date assignment reveals that the baseline estimates for couples are highly statistically significant, with the retirement indicator exhibiting a p -value of 0.010. In contrast, the estimated coefficient of the singles' retirement indicator appears to be as good as random, confirming that the retirement event has little effect on singles' portfolio allocation decisions.

Taken together, the results of the dynamic analysis and the falsification test suggest that the assumptions of the difference-in-differences methodology are satisfied. Next, I examine the relation between wives' sophistication, as proxied by education, and the speed with which couples reallocate their portfolios following the retirement of the husband.

G Wives' Sophistication and Speed of Adjustment

The evidence in Figure 1 and Table A5 suggests that couples gradually reallocate their portfolios away from stocks in response to the husband's retirement. This gradual adjustment is consistent with the findings of Brunnermeier and Nagel (2008), who find that households in the Panel Study of Income Dynamics (PSID) rebalance their portfolios only very slowly. Further, Calvet, Campbell, and Sodini (2009) examine portfolio rebalancing by individual investors, and show that, on average, Swedish households actively rebalance just half of annual passive portfolio

changes. However, they also find significant cross-sectional variation in the speed of adjustment across households. In particular, they find that financially sophisticated households adjust their portfolios most rapidly.

Motivated by these findings, I examine whether financial sophistication drives more rapid rebalancing of couples' portfolios surrounding the retirement of the husband. Since rebalancing away from stocks following the husband's retirement would be favored by the wife in my proposed intra-household bargaining mechanism, this rebalancing should occur more rapidly when the wife is more financially sophisticated. Consistent with the results of Calvet et al. (2009) and studies of financial sophistication (e.g., Lusardi and Mitchell (2007), Lusardi, Mitchell, and Curto (2009)), I use the wife's level of education as a time-invariant proxy for her financial sophistication.

I split the sample of couples on the basis of whether the wife attended college or not, and re-estimate equation (8) for each subsample. I respectively plot the θ_i 's with ± 2 standard error bands in panels A and B of Figure A1. I also present the regression estimates in columns 2 and 3 of Appendix Table A5. Examining the plots in Figure A1 reveals that couples in which wives are better educated reallocate away from stocks more quickly than couples in which wives are less educated. Specifically, couples with more educated wives exhibit a statistically significant reallocation away from stocks equal to about 6.6% of the financial portfolio in the 3 years leading up to the husband's retirement. On the other hand, couples in which the wife did not attend college display a delay in their reallocations away from stocks, with a statistically significant 6.7% reallocation emerging about 4 years after the husband's retirement.⁴

Since retirement is, by and large, a forecastable event in the life-cycle, one would expect a smooth transition beginning before and ending after the retirement event. Overall, the coefficient

⁴I also formally test the difference in the points on the two curves in Figure A1. I find that the reallocations of households with college-educated wives are statistically different at the 5% level from those of households with less educated wives beginning in the 3-year period prior to the husbands retirement event. This statistical difference persists through the 3-year period following the husbands retirement, after which the two curves converge statistically.

patterns in Figure 1 and Figure A1 support the interpretation of retirement as a point of divergence between the behavior of couples and singles with respect to risky asset allocations.

H Spousal Death

A further testable implication of the proposed intra-household bargaining mechanism is that, like husbands' and wives' retirement events, their deaths should also have different effects on risky asset shares. On the one hand, husbands' deaths should be associated with an increase in household-level risk aversion, as household preferences would reflect the widow's preferences alone, leading to a higher risk aversion on average. In turn, husbands' deaths would be followed by a decrease in the share of risky assets. On the other hand, wives' deaths should be associated with opposite-signed effects, leading to lower average household risk aversion and higher risky asset shares.⁵

To test this hypothesis, I use the longitudinal structure of the HRS to construct two panels. The first follows women who continue as respondents following the death of their husbands (i.e., widows). The second analogously follows men whose wives died (i.e., widowers). To study how the portfolio choice decisions of surviving spouses compares to their decisions when their spouses were alive, I then estimate regressions of the following form:

$$w_{risky,i,t} = \alpha_i + \alpha_t + \kappa_k (SpousalDeath_{k,i,t}) + \psi_k (+3yrsSpousalDeath_{k,i,t}) + \Gamma X_{i,t} + \varepsilon_{i,t}, \quad (11)$$

where $k \in \{H, W\}$ (i.e., husband or wife) and $SpousalDeath_k$ is an indicator variable equal to 1 following the death of spouse k , and 0 otherwise. To account for a slow transition following the death event, I also include $+3yrsSpousalDeath_k$, a transition indicator equal to 1 during the 3 years following the death of spouse k , and 0 otherwise. The predictions of the intra-household

⁵I thank an anonymous referee for suggesting this test.

bargaining mechanism suggest that κ_H and κ_W , the average effects associated with husbands' and wives' deaths, should be significantly different.

Column 1 of Table A11 presents the results of estimating equation (11) for widows (surviving wives) with no controls. In column 2, I include the full set of control variables. In both cases, husbands' deaths are associated with about a 10% decrease in the allocation to stocks. The estimates in columns 3 and 4, where I estimate the same specifications for widowers (surviving husbands), show that the death of the wife is typically followed by an increase of about 6% in the share of stocks in the financial portfolio. Though the spousal death coefficient estimates with all control variables are significant only at the 10% level, the difference between the effects associated with husbands' and wives' deaths is highly significant. Specifically, a test of the equality of the spousal death coefficients across the regressions with no controls (all controls) reveals that the gender-specific spousal death coefficients are statistically different at the 1% (5%) level. Overall, this evidence provides further support for the proposed household bargaining mechanism as an important driver of household portfolio choice decisions.

I Additional Robustness Tests

I.1. Health Risk

A strand of the portfolio choice literature examines the effect of health status on households' asset allocation decisions. Rosen and Wu (2004) find health to be a significant cross-sectional predictor of risky asset holdings, with those households in poor health holding a smaller share of their financial portfolios in risky assets. Berkowitz and Qiu (2006) find that these results can be explained by differences in financial wealth, postulating that negative health shocks affect portfolio choices through erosion of financial wealth. Though I control for both household net worth and healthcare expenditures, it is possible that the effects of health status are responsible

for some of the cross-sectional variation in couples' retirement-related asset allocation decisions.

Table A12 presents the results of examining how health status affects couples' portfolio reallocations through the retirement transition. In column 1 of Table A12, I sort couples into three groups based on the self-reported health status of the retiring husband. The first group includes all couple households in which the retiring husband has a health level of excellent or very good, the second those where the husband is in good health, and the third those where the husband self-reports a fair or poor health level at retirement. From the estimation results in column 1, it is apparent that the decrease in couples' risky allocations is not confined to a single health status group, with similar magnitudes across the three groups. Further, formal statistical tests fail to reject the null hypothesis that the difference-in-differences estimates are equal among retirees in the good to excellent and poor to fair health groupings.

In column 2 of Table A12, I examine how health changes through the retirement transition affect portfolio reallocations. I sort couples into three groups based on changes in self-reported health-status of the retiring husband over the period from three years before retirement to three years after retirement. I then classify couple households into three groups: those with deteriorating health status, those with steady health status, and those with improving health status. The regression results in column 2 show that there is little variation in the behavior of couples across the three change-in-health groups.⁶

To ensure that the health status of the retiring husband's wife is not driving the results, I repeat the above tests based on the health status of the wife in columns 3 and 4 of Table A12. In both cases, I find similar results as before. Specifically, in column 3 I find that the estimates among retirees with wives in the good to excellent vs. the poor to fair health groupings are not statistically different. Further, the estimates in column 4 suggest that changes in the wife's

⁶In untabulated specifications, I also test whether disease diagnosis at, or during, retirement can explain the main results, finding little evidence in support of this hypothesis. Similarly, I use data on respondents' retirement expectations to assess the difference between post-retirement allocations across households with expected vs. unexpected retirement events. Similarly, I find no statistical evidence of such a difference.

health cannot explain variation in the behavior of couples through the retirement transition.

I.2. Income and Consumption Risk

A long literature in portfolio choice is concerned with determining the effect of income risk, the covariance of income growth and stock market returns, on household portfolio allocations. Bodie, Merton, and Samuelson (1992), Kimball (1993), and Duffie and Zariphopoulou (1993) show that agents' optimal risky asset allocations decrease with income risk in static and multiperiod settings. The models of Heaton and Lucas (1997), Viceira (2001), and Cocco, Gomes, and Maenhout (2005) extend these results to a lifecycle setting. Empirically, Guiso, Japelli, and Terlizzese (1996) and Bonaparte, Korniotis, and Kumar (2014) respectively find support for the predictions of these models in Italian and Dutch survey data. While the majority of the literature focuses on risk stemming from labor income during households' working years, the intuition remains valid when considering pension income risk during retirement.

To test the effect of income risk on the baseline results, I utilize information on whether or not members of couple households have a defined benefit (DB) pension plan. Since DB pension plans effectively annuitize a portion of the household's retirement wealth, having a DB plan eliminates some income risk during retirement. Column 1 of Table A13 presents the results of sorting couple households on the basis of having a DB pension plan or not. The estimation results in the panel show that the active reallocation away from stocks after retirement is only slightly smaller in magnitude among those couples holding a DB pension, and that this difference is statistically insignificant (F -statistic of 0.56).⁷

In the next test of the effect of income risk, I note that holding retirement assets constant, the risk associated with retirement income fluctuations strictly increases with a household's

⁷Couples are defined to have a DB pension plan if either of the spouses has such pension rights. In untabulated specifications, I further separate such couples into those where the husband, the wife, or both have DB pension rights, and find no difference across the groups.

minimum consumption level. Hence, it is possible that those couples in which the retiring husband was the sole labor market participant are at greater risk for income shortfalls during retirement, as they must finance the retirement consumption of two individuals using the savings accumulated by just one. I test whether this is the case in column 2 of Table A13 by sorting couple households on the basis of whether the wife of the retiring husband was a homemaker during her working years. The results in the panel lend some credibility to this hypothesis, as couples where the wife was a homemaker are estimated to reallocate about 3.2% more of their financial portfolios away from stocks after retirement than other couples. Further, this difference is statistically significant (p -value of 0.056).⁸ However, the reallocation among other couples is still economically and statistically significant, indicating that this channel cannot entirely explain the main result.

The final cross-sectional test I employ in gauging whether retirement income risk drives the baseline results is to split couple households on the basis of their wealth at retirement. Those households with the lowest levels of wealth will be at greater risk of experiencing retirement savings shortfalls, and hence may drive the results. I sort couple households into quartiles on the basis of net worth at retirement and examine the retirement-induced reallocations of couples across classifications. The estimates in column 3 of Table A13 show that, contrary to the hypothesis that the poorest households drive the results, couples in the highest and lowest wealth quartiles exhibit reallocations away from stocks that are relatively similar in magnitude. Specifically, the difference in coefficients between the extreme wealth quartiles is statistically insignificant (p -value of 0.267). Further, couples in the second and third wealth quartiles also exhibit statistically and economically significant retirement-related reallocation estimates, albeit

⁸This result also provides evidence supporting that from tests comparing the effect of the wife's retirement after conditioning on the relative importance of her pre-retirement income in Table 5. In this context, the income of a husband whose wife is a homemaker is very important to the household before his retirement. If income is a determinant of bargaining power, as suggested by theory (e.g., Manser and Brown (1980), McElroy and Horney (1981)), then the husband's retirement can be expected to lead to a larger drop in bargaining power after retirement when his wife was a homemaker.

of smaller magnitude.

I.3. Children

Love (2010) shows that children present an important source of background risk in a life cycle model of portfolio choice, leading to significantly different asset allocation decisions among parents vs. non-parents. Though the background risks he models may not apply to retirees with grown children, the presence of children may still affect portfolio choices through such channels as bequest motives. Table A14 presents the results of regressions in which I sort couple households on the number of living children they have. The table shows that heterogeneity with respect to children is indeed related to the magnitude of the main result. Those couples with no children exhibit the largest average post-retirement reallocations away from stocks. However, the results are not driven by this group, as the reallocations among those with 1-2, 3-4, and 5 or more children are all economically and statistically significant.

I.4. Age of Retirement

Table A15 presents the results of regressions where I condition couple households on the age of the husband's retirement. The table shows that while there is some heterogeneity in post-retirement reallocations with respect to retirement age, for the large majority of retirements (occurring between the ages of 55 and 70), the estimates are relatively stable.

I.5. Entrepreneurs

Table A16 presents the results of conditional regressions, where I condition couple households on whether the retiring husband was an entrepreneur or not. The left panel of the table shows that this distinction does have an effect on the results when considering the share of stocks in the financial portfolio. Retiring entrepreneurs reallocate a smaller portion of their financial

portfolios away from stocks than non-entrepreneurs. However, the right panel of the table shows that retiring entrepreneurs and non-entrepreneurs behave much more similarly once private business holdings are taken into account. This is consistent with public and private equity being complementary components of the overall risky asset portion in households' financial portfolios (Heaton and Lucas (2000a, 2000b)).

I.6. Cognitive Ability

Table A17 presents the results of regressions where I condition couples on cognitive function of the retiring husband. The HRS provides various measures of respondents' cognitive function. These include self-reported memory, immediate and delayed word recall, ability to name presidents and vice-presidents, and vocabulary measures. As mathematical cognitive abilities can affect portfolio choice decisions (Christelis, Jappelli, and Padula (2010)), I use an HRS measure known as "serial 7's." For five trials, respondents are asked to subtract 7 from the prior number, beginning with 100. Scores range from 0 to 5, based on the number of correct subtractions respondents make. Approximately half of respondents achieve a score of 4 or 5, with the remainder achieving a score of 3 or less. I compare those couples in which the retiring husband achieved a score of 4 or 5 at retirement with those where he achieved a score of 3 or less, roughly splitting the sample into top and bottom halves. The results in Table A17 show that while those couples where the retiring husband's mathematical cognitive abilities are lower move out of risky assets to a greater degree after retirement, the difference between the two groups is economically small.

I.7. Split-sample Analysis: Pre- vs. post-2000

Expectations regarding future investment opportunities may affect the behavior of retiring couples. Further, if investment opportunities are time-varying, the time of retirement may have an

effect on the main results, in that those retiring during so-called good times may act differently from those retiring when the market is more volatile. I sort retirement events into those that occurred between 1992 and 2000, and those that occurred between 2001 and 2008. Table A18 presents the results of regressions where I condition couple households on whether the head-of-household retired before or during 2000, or during the period from 2001 to 2008. The table shows that while the main result is stronger during the post-2000 period, the results do not seem to be driven by retirement events during one of the two subperiods.

I.8. Wife’s Life Expectancy

Women tend to live longer than their husbands and those with longer life expectancy are expected to invest a greater share in risky assets. Thus, the horizon effects of women with long life expectancies may mute or even dominate the risk aversion channel. In this subsection, I test how the wife’s life expectancy affects the magnitude of reallocations following the husband’s retirement. Specifically, I sort couple households into terciles, based on the wife’s life expectancy at the time of her husband’s retirement. Table A19 presents the results of this analysis.

In column 1, I use wives’ actual life expectancies based on actuarial life tables. Across the three groups, there is very little variation in the effect of the husband’s retirement on couples’ portfolio reallocations. In column 2, I instead use wives’ perceived probabilities of living to age 75 to sort households. The results show that couples with wives who expect to live the longest exhibit reallocations away from stocks that are of slightly smaller magnitude than those with wives who perceive the lowest survival probabilities. However, the difference in reallocations between the two groups is economically small (0.943%) and statistically insignificant (p -value = 0.445).

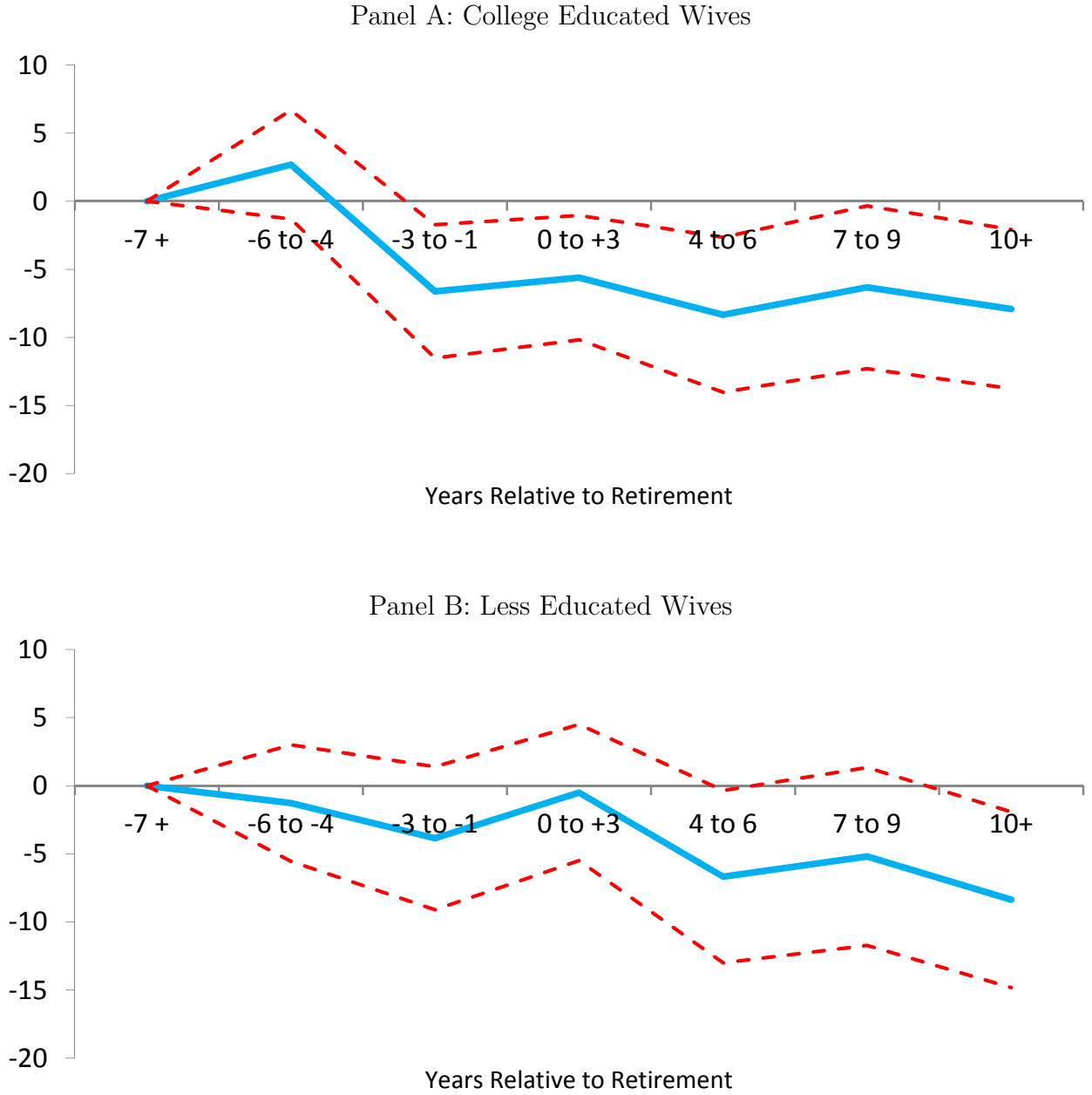
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Figure A1: First differences between singles' and couples' risky asset shares surrounding retirement



This figure displays the first difference between couples' and singles' reallocations during each period relative to retirement. The plotted points are the θ_j 's, surrounded by ± 2 standard error bands, estimated from regression equation (8):

$$w_{risky,i,t} = \alpha_i + \alpha_t + \sum_{j=1}^6 [\theta_j (Period_{j,i,t} \times Married_{i,t}) + \eta_j (Period_{j,i,t})] + \delta (Married_{i,t}) + \Gamma X_{i,t} + \varepsilon_{i,t}.$$

Panel A displays the θ_j coefficients estimated using the subsample of couples in which the wife attended college, while Panel B displays the estimates from the subsample of couples in which the wife did not attend college.

Figure A2: Years between couples' retirement dates



This figure displays a kernel density plot of the difference in husbands' and their wives' retirement dates, with positive(negative) values representing those couples where the husband(wife) retires first. The Epanechnikov kernel with globally optimal bandwidth is used to calculate the density.

Table A1
HRS Singles Summary Statistics by Gender (1992-2012 waves)

	Mean: Single Males	Mean: Single Females
<i>Characteristics - Household Head</i>		
Age (years)	72.98	74.34
Education (years)	13.67	13.66
Labor Income (\$)	40,555	26,980
Pension Income (\$)	15,095	11,868
Children	2.17	1.97
Risk Aversion	8.11	8.35
<i>Household wealth statistics (\$)</i>		
Net Worth	710,441	449,771
Home Equity	183,316	160,413
Private Business Holdings	54,591	12,838
Additional Real Estate Holdings	90,740	31,864
<i>Financial portfolio statistics</i>		
Stock allocation (%), stockholders	49.28	46.98
Total financial wealth (\$)	399,757	241,451
Total observations	2,924	4,350

Data are from the 1992-2012 waves of the Health and Retirement Study (HRS). This table displays summary statistics for the sample of couple and single households. Observations are required to have positive financial wealth (cash + stocks + bonds), positive stockholdings, and non-missing net worth (financial wealth + home equity + private business + real estate + vehicle equity - other debts). Education is measured in years, with 12 representing high-school graduation, 16 representing completion of an undergraduate degree, and 17 representing at least some post-graduate education.

Table A2
Household Stock Market Participation and Retirement

	Stock Market Participation
	(1)
Retired Indicator x Married Indicator	-0.048*** (0.012)
Retired Indicator	0.012 (0.010)
+/-3 yrs Retirement Indicator x Married Indicator	-0.024** (0.011)
+/-3 yrs Retirement Indicator	0.011 (0.008)
Married Indicator	0.053*** (0.013)
Family Labor Income	0.007*** (0.001)
Family Net Worth	0.002*** (0.000)
Family Pension Income	0.010*** (0.002)
Number of Children	0.003 (0.002)
Age-squared/100 of Head	0.002 (0.004)
Family Healthcare Expenditures	-0.002** (0.001)
Household Fixed-Effects	Yes
Time Fixed-Effects	Yes
Observations	91514
Households	14794

This table presents the results of household fixed-effect panel logit difference-in-differences specifications regressing a stock market participation indicator on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A3
Household Asset Allocations and Retirement, Difference-in-Differences specifications
Robustness: Alternative Control Groups

	Stock Allocation (%)			
	Control Group: Non-Widows Only	Control Group: Never Married Only	Singles Never Married, Married Never Single	Control Group: Divorcees Only
	(1)	(2)	(3)	(4)
Retired Indicator x Married Indicator	-8.115*** (2.518)	-9.179*** (2.602)	-8.961*** (2.626)	-8.411** (3.516)
Retired Indicator	1.977 (2.444)	2.644 (2.469)	2.610 (2.483)	2.475 (3.430)
+/-3 yrs Retirement Indicator x Married Indicator	-5.613*** (2.200)	-4.299** (2.162)	-4.266** (2.183)	-5.029 (3.140)
+/-3 yrs Retirement Indicator	2.383 (2.070)	0.944 (2.001)	0.938 (2.006)	1.926 (3.039)
Married Indicator	2.383 (2.947)			4.002 (4.391)
Family Labor Income	0.394*** (0.098)	0.441*** (0.099)	0.446*** (0.105)	0.398*** (0.101)
Family Net Worth	0.031*** (0.009)	0.038*** (0.009)	0.037*** (0.009)	0.033*** (0.010)
Family Pension Income	0.084 (0.244)	0.005 (0.240)	0.014 (0.258)	-0.010 (0.251)
Number of Children	0.227 (0.524)	-0.004 (0.554)	-0.137 (0.688)	0.124 (0.559)
Age-squared/100 of Head	2.758*** (0.383)	2.429*** (0.673)	-0.834*** (0.194)	2.646*** (0.481)
Family Healthcare Expenditures	0.147 (0.208)	0.086 (0.198)	0.122 (0.215)	0.078 (0.231)
Household Fixed-Effects	Yes	Yes	Yes	Yes
Time Fixed-Effects	Yes	Yes	Yes	Yes
Observations	20399	23100	20942	18875
Households	5236	6080	5240	4892

This table presents the results of difference-in-difference specifications regressing stock allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. In column 1, the control group includes only observations for singles who are not widowed. In column 2, the control group includes only observations for singles who have never been married in the sample. In column 3, only singles who have never been married and couples who have never been single in the sample are included in the estimation. In column 4, the control group includes only observations for singles who have been married and subsequently divorced. All specifications include controls for family labor income, net worth, pension income, number of children, squared age of the head, and out-of-pocket healthcare expenditures. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A4
Household Asset Allocations and Retirement, Difference-in-Differences specifications
Robustness: Alternative Control Groups

	Stock Allocation (%)			
	Control Group: Non-Widows Only	Control Group: Never Married Only	Singles Never Married, Married Never Single	Control Group: Divorcees Only
	(1)	(2)	(3)	(4)
Retired Indicator x Married Indicator	-8.642*** (2.507)	-9.649*** (2.592)	-9.483*** (2.616)	-8.809** (3.509)
Retired Indicator	1.739 (2.444)	2.225 (2.474)	2.147 (2.488)	2.103 (3.439)
+/-3 yrs Retirement Indicator x Married Indic	-5.762*** (2.193)	-4.385** (2.156)	-4.376** (2.177)	-5.223* (3.143)
+/-3 yrs Retirement Indicator	2.511 (2.068)	1.005 (2.002)	0.976 (2.007)	2.110 (3.048)
Married Indicator	3.366 (2.911)			5.625 (4.322)
Household Fixed-Effects	Yes	Yes	Yes	Yes
Time Fixed-Effects	Yes	Yes	Yes	Yes
Observations	20399	23100	20942	18875
Households	5236	6080	5240	4892

This table presents the results of difference-in-difference specifications regressing stock allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. In column 1, the control group includes only observations for singles who are not widowed. In column 2, the control group includes only observations for singles who have never been married in the sample. In column 3, only singles who have never been married and couples who have never been single in the sample are included in the estimation. In column 4, the control group includes only observations for singles who have been married and subsequently divorced. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A5
Household Asset Allocations and Retirement, Dynamics Around Retirement

		Stock Allocation (%)		
			Wife Attended College	Wife Did Not Attend College
		(1)	(2)	(3)
4-6 years PRE-Retirement	Period Indicator x Married Indicator	1.196 (1.901)	2.690 (2.036)	-1.276 (2.182)
	Period Indicator	-1.719 (1.702)	-2.141 (1.715)	-1.005 (1.722)
1-3 years PRE-Retirement	Period Indicator x Married Indicator	-5.635** (2.328)	-6.620*** (2.499)	-3.857 (2.677)
	Period Indicator	3.427 (2.101)	2.891 (2.136)	3.463 (2.127)
0-3 years POST-Retirement	Period Indicator x Married Indicator	-3.893* (2.170)	-5.609** (2.327)	-0.503 (2.551)
	Period Indicator	-1.511 (2.050)	-2.615 (2.114)	-1.916 (2.169)
4-6 years POST-Retirement	Period Indicator x Married Indicator	-8.193*** (2.691)	-8.336*** (2.901)	-6.678** (3.227)
	Period Indicator	-0.571 (2.617)	-2.398 (2.735)	-0.752 (2.853)
7-9 years POST-Retirement	Period Indicator x Married Indicator	-6.058** (2.801)	-6.318** (3.049)	-5.197 (3.332)
	Period Indicator	-2.370 (2.782)	-4.066 (2.930)	-2.479 (3.059)
10+ years POST-Retirement	Period Indicator x Married Indicator	-8.214*** (2.710)	-7.914*** (2.982)	-8.370** (3.292)
	Period Indicator	-1.674 (2.899)	-3.420 (3.129)	-2.284 (3.279)
	Married Indicator	6.595** (2.694)	6.415** (3.068)	6.655* (3.474)
	Family Labor Income	0.356*** (0.099)	0.418*** (0.112)	0.245 (0.172)
	Family Net Worth	0.041*** (0.009)	0.041*** (0.010)	0.054*** (0.012)
	Family Pension Income	0.026 (0.234)	0.119 (0.276)	-0.173 (0.352)
	Number of Children	-0.263 (0.525)	0.036 (0.703)	-1.205 (0.762)
	Age-squared/100 of Head	2.809*** (0.392)	2.632*** (0.442)	9.497*** (0.794)
	Family Healthcare Expenditures	0.146 (0.177)	0.034 (0.212)	0.273 (0.209)
	Household Fixed-Effects	Yes	Yes	Yes
	Time Fixed-Effects	Yes	Yes	Yes
	Observations	24338	16521	15091
	Households	6210	4279	4325

This table presents the results of dynamic difference-in-differences specifications regressing stock allocations on period indicators (equal to 1 if the head-of-household falls in the period relative to retirement, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the period and married indicators. The head of household is defined to be the husband in couple households. The dependent variable is the allocation to stocks. Column 1 includes observations for all couples in the sample. Column 2 focuses on couples in which the wife attended college for at least one year. Column 3 focuses on couples in which the wife did not attend college. All specifications include controls for family labor income, net worth, pension income, number of children, squared age of the head, and out-of-pocket healthcare expenditures. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A6
Gender Differences in Risk Aversion and Stock Allocation

Panel A: Risk Aversion			
	(1)	(2)	(3)
Female Indicator	0.329*** (0.078)	0.332*** (0.102)	0.315*** (0.103)
Control Variables	No	Yes	Yes
Religion Fixed-Effects	No	No	Yes
Race Fixed-Effects	No	No	Yes
Observations	52022	50799	50799
Households	6695	6644	6644
Panel B: Stock Allocation (%)			
	(1)	(2)	(3)
Risk Aversion	-1.090*** (0.148)	-0.421*** (0.141)	-0.406*** (0.141)
Control Variables	No	Yes	Yes
Religion Fixed-Effects	No	No	Yes
Race Fixed-Effects	No	No	Yes
Time Fixed-Effects	Yes	Yes	Yes
Observations	45279	42896	42896
Households	6487	6324	6324

Panel A presents the results of specifications regressing individual risk aversion on an indicator for whether the respondent is female. Panel B presents the results Tobit specifications regressing stock allocations on respondents' risk aversion. Columns 2 and include a standard set of control variables, including labor income, net worth, pension income, age, years of formal education, and whether the respondent is married. Following Barsky et al. (1997), column 3 adds religion and race fixed-effects. Religion fixed-effects include indicators for whether a respondent identifies as Catholic, Jewish, or Protestant. Race fixed-effects include indicators for whether a respondent identifies as Black or Other (non-White). Standard errors are heteroskedasticity robust and clustered at the respondent level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A7
Household Asset Allocations and Retirement, Difference-in-Differences specifications
Robustness: Sample Attrition and Compositional Changes

	Temporary Attrition Indicator	Stock Allocation (%)	
			Balanced Singles Never Married, Married Never Single
	(1)	(2)	(3)
Stock Allocation (%)	-0.003** (0.001)		
Retired Indicator x Married Indicator Temporary attritors		-7.936*** (2.349)	
Retired Indicator x Married Indicator Non-attritors		-9.070*** (2.345)	
Retired Indicator x Married Indicator			-7.495*** (2.822)
Retired Indicator	-0.118 (0.094)	1.741 (2.187)	2.807 (2.819)
+/-3 yrs Retirement Indicator x Married Indicator		-4.306** (1.969)	-3.694 (2.256)
+/-3 yrs Retirement Indicator		0.816 (1.823)	0.867 (2.151)
Married Indicator	0.136** (0.066)	6.914*** (2.403)	
Control Variables	Yes	Yes	Yes
Household Fixed-Effects	Yes	Yes	Yes
Time Fixed-Effects	Yes	Yes	Yes
Observations	6210	24338	7958
Households	6210	6210	2322

Column 1 presents the results of a logit specification regressing a temporary attrition indicator on the average risky asset share and a set of mean control variables. Columns 2 and 3 present the results of difference-in-difference specifications regressing stock allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. In column 2, the interaction term is further interacted with indicators for whether the household was ever a temporary sample attritor or not. In column 3, I restrict the sample to a panel balanced in event-time before and after retirement and include only observations for singles who have never been married and married couples who have never been single in the sample. All specification include controls for family labor income, net worth, pension income, number of children, squared age of the head, and out-of-pocket healthcare expenditures. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A8
Pre- and Post-Retirement Summary Statistics, Attrition-free panel balanced around retirement

	Couples			Singles		
	Mean Pre-Retirement	Mean Post-Retirement	Difference (Post - Pre)	Mean Pre-Retirement	Mean Post-Retirement	Difference (Post - Pre)
<i>Portfolio statistics</i>						
Stock allocation (%), stockholders	40.36	38.31	-2.05	44.21	47.10	2.89
Total financial wealth (\$)	374,510	465,327	90,817	246,141	262,071	15,930
<i>Income and wealth levels (\$)</i>						
Labor Income (head)	49,535	7,004	-42,531	28,858	4,085	-24,774
Pension Income (head)	777	9,714	8,937	1,346	8,242	6,896
Net Worth	656,235	904,046	247,811	424,426	575,296	150,870
Home Equity	191,458	325,718	134,260	117,465	185,774	68,309

Data are from the 1992-2012 waves of the Health and Retirement Study (HRS). This table displays pre- and post-retirement summary statistics for the sample of couple and single households in the estimation sample. Observations are required to have positive financial wealth (cash + stocks + bonds), positive stockholdings, and non-missing net worth (financial wealth + home equity + private business + real estate + vehicle equity - other debts).

Table A9
Incorporating Social Security Wealth and Retirement-Plan Equity

	Dependent Variable: Stock Allocation (%)		
	Financial Portfolio: Includes Social Security Wealth	Households with Zero IRA Wealth	Households with Zero DC Wealth
	(1)	(2)	(3)
Retired Indicator x Married Indicator	-3.466*** (1.167)	-9.870*** (3.351)	-5.511** (2.486)
Retired Indicator	0.404 (1.138)	2.059 (2.181)	-1.783 (1.626)
+/-3 yrs Retirement Indicator x Married Indicator	-2.447*** (0.850)	-2.510 (3.656)	-3.285 (2.859)
+/-3 yrs Retirement Indicator	0.230 (0.771)	-2.778 (2.419)	0.631 (2.021)
Married Indicator	0.047 (1.427)	9.870** (3.928)	5.784 (4.206)
Family Labor Income	0.270*** (0.067)	-0.227 (0.308)	0.038 (0.192)
Family Net Worth	0.154*** (0.009)	0.047*** (0.018)	0.061*** (0.018)
Family Pension Income	0.270 (0.223)	-0.547 (0.511)	-0.450 (0.393)
Number of Children	-0.244 (0.248)	-0.667 (1.061)	0.447 (1.011)
Age-squared/100 of Head	0.138* (0.073)	3.194*** (0.122)	10.861*** (1.656)
Family Healthcare Expenditures	0.099 (0.149)	0.432 (0.299)	-0.143 (0.469)
Household Fixed-Effects	Yes	Yes	Yes
Time Fixed-Effects			
Observations	15640	8905	6858
Households	4637	3616	2117

This table presents the results of difference-in-difference specifications regressing risky asset class allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. The dependent variable in all specifications is the percentage of stocks in the financial portfolio. In column 1, the financial portfolio includes implicit Social Security wealth, which is treated as a bond. In column 2, only households with IRA assets equal to zero are included in the sample. In column 3, only households with DC retirement plan assets equal to zero are included in the sample. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A10
Household Asset Allocations and Retirement, Falsification Test

	Baseline Estimates	Random Retirement Reassignment: Mean Estimates	Difference [<i>p</i> -value]: (2) - (1)
	(1)	(2)	(3)
Retired Indicator x Married Indicator	-8.443	-3.477	4.966 [0.010]
Retired Indicator	1.755	2.476	0.721 [0.636]
+/-3 yrs Retirement Indicator x Married Indicator	-4.282	-1.272	3.01 [0.076]
+/-3 yrs Retirement Indicator	0.815	0.938	0.123 [0.515]
Control Variables	Yes	Yes	
Household Fixed-Effects	Yes	Yes	
Time Fixed-Effects	Yes	Yes	
Observations	24338	24338	
Households	6210	6210	

This table presents the results of a falsification test of the difference-in-difference specification. Column 1 presents the point estimates from the baseline specification regressing risky asset class allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. Column 2 displays the mean point estimates obtained from 1,000 trials, in each of which the retirement of the household head is randomly reassigned across households. Column 3 presents the difference between the baseline estimates and the mean of the empirical distribution obtained from the 1,000 random trials, as well as the *p*-value (in square brackets) obtained by comparing the baseline estimate with the empirical distribution of coefficients obtained from the 1,000 random trials. All regression specifications include controls for family labor income, net worth, pension income, number of children, squared age of the head, and out-of-pocket healthcare expenditures.

Table A11
Household Asset Allocations and Spousal Death

	Stock Allocation (%)			
	Widows (Surviving Wives)		Widowers (Surviving Husbands)	
	(1)	(2)	(3)	(4)
Spousal Death Indicator	-9.632* (5.385)	-10.582* (6.295)	6.283** (3.081)	5.983* (3.167)
3 yrs post-Spousal Death Indicator	-2.247* (1.232)	-2.513** (1.242)	2.467 (1.787)	2.036 (1.825)
Family Labor Income		0.499* (0.259)		0.442 (0.315)
Family Net Worth		0.063*** (0.015)		0.065*** (0.018)
Family Pension Income		0.570 (0.607)		0.110 (0.661)
Number of Children		0.474 (0.949)		-0.799 (0.789)
Age-squared/100 of Head		0.171 (0.456)		-0.131 (0.242)
Family Healthcare Expenditures		0.503* (0.297)		0.357 (0.327)
Household Fixed-Effects	Yes	Yes	Yes	Yes
Time Fixed-Effects	Yes	Yes	Yes	Yes
Observations	5737	5655	3249	3142
Households	2096	2077	900	891
F-statistic (p-value): Widow Spousal Death = Widower Spousal Death			6.56 (0.010)	5.50 (0.019)

This table presents the results of specifications regressing stock allocations on an indicator for death of the wife (equal to 1 if the wife has been dead for more than 3 years at time of observation, and equal to 0 otherwise) and a transition indicator (equal to 1 for the 3 years following death of the wife). The head of household is defined to be the husband in couple households. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A12
Household Asset Allocations and Health Status

	Stock Allocation (%)			
	Husband's Health		Wife's Health	
	(1)	(2)	(3)	(4)
Retired Indicator x Married Indicator Health: Very Good - Excellent	-8.840*** (2.316)		-6.129*** (2.147)	
Retired Indicator x Married Indicator Health: Good	-7.212*** (2.438)		-5.567** (2.351)	
Retired Indicator x Married Indicator Health: Fair - Poor	-9.043*** (2.857)		-4.714* (2.663)	
Retired Indicator x Married Indicator Deteriorating Health Status		-8.069*** (2.320)		-7.022*** (2.620)
Retired Indicator x Married Indicator Steady Health Status		-8.499*** (2.280)		-7.064*** (2.571)
Retired Indicator x Married Indicator Improving Health Status		-8.589*** (2.296)		-7.179*** (2.591)
Retired Indicator	1.682 (2.180)	1.781 (2.187)	-0.367 (2.069)	0.335 (2.388)
+/-3 yrs Retirement Indicator x Married Indicator	-4.236** (1.963)	-4.280** (1.969)	-2.359 (1.877)	-3.337 (2.164)
+/-3 yrs Retirement Indicator	0.770 (1.819)	0.829 (1.823)	-0.726 (1.763)	-0.235 (1.936)
Married Indicator	6.764*** (2.396)	6.865*** (2.403)	4.208* (2.213)	4.092 (2.752)
Control Variables	Yes	Yes	Yes	Yes
Household Fixed-Effects	Yes	Yes	Yes	Yes
Time Fixed-Effects	Yes	Yes	Yes	Yes
Observations	24338	24338	24320	21868
Households	6210	6210	6207	5934
F-statistic (p-value): High Health = Low Health	0.01 (0.920)	0.53 (0.468)	0.51 (0.475)	0.01 (0.836)

This table presents the results of difference-in-differences specifications regressing risky asset class allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. In column 1 (column 3), this interaction term is further interacted with the health level of the head-of-household (wife) at retirement: excellent or very good vs. good vs. fair or poor. In column 2 (column 4), the interaction term is further interacted with the directional change in health through the retirement transition of the head of household (wife): deteriorating vs. steady vs. improving. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. Control variables are suppressed for brevity. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A13
Household Asset Allocations, Consumption Risk

	Stock Allocation (%)		
	DB Pension Holders	Wives' Labor Market Participation	Wealth at Retirement
	(1)	(2)	(3)
Retired Indicator x Married Indicator DB Pension: Yes	-7.584*** (2.163)		
Retired Indicator x Married Indicator DB Pension: No	-8.522*** (1.835)		
Retired Indicator x Married Indicator Wife: Homemaker		-11.229*** (2.335)	
Retired Indicator x Married Indicator Wife: Not Homemaker		-8.024*** (1.845)	
Retired Indicator x Married Indicator Wealth Quartile 1			-11.843*** (2.892)
Retired Indicator x Married Indicator Wealth Quartile 2			-6.700** (2.765)
Retired Indicator x Married Indicator Wealth Quartile 3			-7.507*** (2.368)
Retired Indicator x Married Indicator Wealth Quartile 4			-9.306*** (2.468)
Retired Indicator	1.684 (1.801)	1.793 (1.799)	1.758 (2.188)
+/-3 yrs Retirement Indicator x Married Indicator	-4.281** (1.737)	-4.261** (1.737)	-4.298** (1.969)
+/-3 yrs Retirement Indicator	0.786 (1.590)	0.830 (1.589)	0.827 (1.823)
Married Indicator	6.902*** (1.953)	6.602*** (1.956)	6.970*** (2.408)
Control Variables	Yes	Yes	Yes
Household Fixed-Effects	Yes	Yes	Yes
Time Fixed-Effects	Yes	Yes	Yes
Observations	24338	24338	24338
Households	6210	6210	6210
F-statistic (p-value): DB Pension = No DB Pension	0.56 (0.455)		
F-statistic (p-value): Homemaker = Not Homemaker		3.70 (0.054)	
F-statistic (p-value): Wealth Q1 = Wealth Q4			1.23 (0.267)

This table presents the results of difference-in-differences specifications regressing stock allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. In column 1, the interaction term is further interacted with indicators for whether either member of a couple is a defined benefit pension holder or not. In column 2, the interaction term is further interacted with indicators for whether the spouse in a couple household was a homemaker or not. In column 3, this interaction term is further interacted with the wealth level (in quartiles) of the head-of-household at retirement. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. Control variables are suppressed for brevity. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A14
Household Asset Allocations and Retirement
Robustness: Children

	Stock Allocation (%)
	(1)
Retired Indicator x Married Indicator No Children	-9.428*** (3.418)
Retired Indicator x Married Indicator 1-2 Children	-8.324*** (2.366)
Retired Indicator x Married Indicator 3-4 Children	-8.165*** (2.371)
Retired Indicator x Married Indicator 5+ Children	-9.217*** (2.707)
Retired Indicator	1.752 (2.188)
+/-3 yrs Retirement Indicator x Married Indicator	-4.277** (1.970)
+/-3 yrs Retirement Indicator	0.811 (1.823)
Married Indicator	6.850*** (2.403)
Family Labor Income	0.432*** (0.096)
Family Net Worth	0.040*** (0.009)
Family Pension Income	-0.039 (0.233)
Number of Children	-0.215 (0.550)
Age-squared/100 of Head	2.833*** (0.387)
Family Healthcare Expenditures	0.160 (0.178)
Household Fixed-Effects	Yes
Time Fixed-Effects	Yes
Observations	24338
Households	6210

This table presents the results of difference-in-differences specifications regressing risky asset class allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. This interaction term is further interacted with indicators for whether married couples have no children, 1-2 children, 3-4 children, or 5 or more children. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A15
Household Asset Allocations and Retirement
Robustness: Age of Retirement

	Stock Allocation (%)
	(1)
Retired Indicator x Married Indicator Retirement Age: 55 or lower	-14.918*** (2.748)
Retired Indicator x Married Indicator Retirement Age: 56 to 60	-8.835*** (2.546)
Retired Indicator x Married Indicator Retirement Age: 61 to 65	-7.960*** (2.353)
Retired Indicator x Married Indicator Retirement Age: 66 to 70	-6.844** (2.814)
Retired Indicator x Married Indicator Retirement Age: 71 or higher	-3.138 (3.315)
Retired Indicator	1.584 (2.187)
+/-3 yrs Retirement Indicator x Married Indicator	-4.497*** (1.970)
+/-3 yrs Retirement Indicator	0.678 (1.823)
Married Indicator	7.053*** (2.402)
Family Labor Income	0.435*** (0.096)
Family Net Worth	0.040*** (0.009)
Family Pension Income	-0.028 (0.233)
Number of Children	-0.276 (0.522)
Age-squared/100 of Head	2.482*** (0.371)
Family Healthcare Expenditures	0.149 (0.178)
Household Fixed-Effects	Yes
Time Fixed-Effects	Yes
Observations	24338
Households	6210

This table presents the results of difference-in-difference specifications regressing risky asset class allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. This interaction term is further interacted with indicators for the age at which head-of-household in married couples retires. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A16
Household Asset Allocations and Retirement
Robustness: Entrepreneurs

	Stock Allocation (%)	Stock + Private Business Allocation (%)
	(1)	(2)
Retired Indicator x Married Indicator Entrepreneurs	-5.914** (2.433)	-10.04*** (2.456)
Retired Indicator x Married Indicator Non-Entrepreneurs	-9.822*** (2.425)	-10.75*** (2.449)
Retired Indicator	2.789 (2.314)	3.691 (2.333)
+/-3 yrs Retirement Indicator x Married Indicator	-4.265** (1.978)	-6.677*** (2.029)
+/-3 yrs Retirement Indicator	1.269 (1.852)	1.862 (1.896)
Married Indicator	6.364** (2.549)	7.860*** (2.545)
Family Labor Income	0.371*** (0.0984)	0.474*** (0.0997)
Family Net Worth	0.0204** (0.0102)	0.0714*** (0.0103)
Family Pension Income	-0.260 (0.272)	-0.129 (0.269)
Number of Children	-0.321 (0.636)	-0.997 (0.646)
Age-squared/100 of Head	3.193*** (0.171)	4.224*** (0.161)
Family Healthcare Expenditures	-0.0486 (0.244)	-0.172 (0.257)
Household Fixed-Effects	Yes	Yes
Time Fixed-Effects	Yes	Yes
Observations	15886	16054
Households	3754	3865

This table presents the results of difference-in-difference specifications regressing risky asset class allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. This interaction term is further interacted with indicators for whether the head-of-household was an entrepreneur or not prior to retirement. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A17
Household Asset Allocations and Retirement
Robustness: Cognitive Ability

	Stock Allocation (%)
	(1)
Retired Indicator x Married Indicator Cognitive Ability: Top Half	-8.212*** (2.279)
Retired Indicator x Married Indicator Cognitive Ability: Bottom Half	-8.699*** (2.293)
Retired Indicator	1.722 (2.187)
+/-3 yrs Retirement Indicator x Married Indica	-4.277* (1.970)
+/-3 yrs Retirement Indicator	0.810 (1.823)
Married Indicator	6.828** (2.403)
Family Labor Income	0.433*** (0.096)
Family Net Worth	0.040*** (0.009)
Family Pension Income	-0.042 (0.233)
Number of Children	-0.282 (0.526)
Age-squared/100 of Head	2.831*** (0.386)
Family Healthcare Expenditures	0.162 (0.178)
Household Fixed-Effects	Yes
Time Fixed-Effects	Yes
Observations	24338
Households	6210

This table presents the results of difference-in-difference specifications regressing risky asset class allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. This interaction term is further interacted with indicators for whether the head-of-household whether the retiring head-of-household scores a 4 or 5 in the HRS "serial 7's" test or scores a 3 or below. The "serial 7's" test asks respondents to subtract 7 from the prior number, beginning with 100, for five trials. Scores range from 0 to 5, based on the number of correct subtractions they made. Approximately half of respondents achieve a score of 4 or 5, with the remainder achieving a score of 3 or less. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A18
Household Asset Allocations and Retirement
Robustness: Split-Sample Analysis

	Stock Allocation (%)
	(1)
Retired Indicator x Married Indicator	-8.400***
Time of Retirement: Pre-2000	(2.298)
Retired Indicator x Married Indicator	-8.570***
Time of Retirement: Post-2000	(2.587)
+/-3 yrs Retirement Indicator x Married Indicator	1.772
	(2.196)
+/-3 yrs Retirement Indicator	-4.272**
	(1.970)
Transition Indicator	0.825
	(1.827)
Married Indicator	6.827***
	(2.416)
Family Labor Income	0.431***
	(0.097)
Family Net Worth	0.040***
	(0.009)
Family Pension Income	-0.038
	(0.232)
Number of Children	-0.282
	(0.526)
Age-squared/100 of Head	2.815***
	(0.389)
Family Healthcare Expenditures	0.161
	(0.178)
Household Fixed-Effects	Yes
Time Fixed-Effects	Yes
Observations	24338
Households	6210

This table presents the results of difference-in-difference specifications regressing risky asset class allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. This interaction term is further interacted with indicators for whether the head-of-household retired in the first half of the sample (up to 2000) or the second half of the sample (after 2000). Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.

Table A19
Household Asset Allocations and Wife's Life Expectancy

	Stock Allocation (%)	
	Life Expectancy Measure	
	Actual	Perceived
	(1)	(2)
Retired Indicator x Married Indicator Wife's Life Expectancy: Highest Tercile	-8.503*** (2.470)	-7.848*** (2.469)
Retired Indicator x Married Indicator Wife's Life Expectancy: Middle Tercile	-7.869*** (2.387)	-7.869*** (2.320)
Retired Indicator x Married Indicator Wife's Life Expectancy: Lowest Tercile	-8.520*** (2.272)	-8.791*** (2.289)
Retired Indicator	1.660 (2.192)	1.332 (2.225)
+/-3 yrs Retirement Indicator x Married Indicator	-4.269** (1.970)	-4.224** (1.971)
+/-3 yrs Retirement Indicator	0.776 (1.824)	0.643 (1.832)
Married Indicator	6.905*** (2.408)	7.040*** (2.418)
Family Labor Income	0.431*** (0.096)	0.430*** (0.097)
Family Net Worth	0.040*** (0.009)	0.039*** (0.009)
Family Pension Income	-0.042 (0.233)	-0.051 (0.233)
Number of Children	-0.290 (0.525)	-0.298 (0.525)
Age-squared/100 of Head	2.819*** (0.390)	2.841*** (0.393)
Family Healthcare Expenditures	0.160 (0.178)	0.155 (0.178)
Household Fixed-Effects	Yes	Yes
Time Fixed-Effects	Yes	Yes
Observations	24338	24338
Households	6210	6210
F-statistic (p-value): High Life Exp. = Low Life Exp.	0.00 (0.988)	0.58 (0.445)

This table presents the results of difference-in-differences specifications regressing risky asset class allocations on an indicator for retirement of the head-of-household (equal to 1 if the head-of-household has been retired for more than 3 years at time of observation, and equal to 0 otherwise), an indicator for the head-of-household being married (equal to 1 for married, and 0 otherwise), as well as the interaction between the retirement and married indicators. In column 1, this interaction term is further interacted with the wife's actual life expectancy at the time of the husband's retirement. In column 2, the interaction term is further interacted with the wife's perceived life expectancy at the time of the husband's retirement. Also included in the regression is a transition indicator (equal to 1 for the +/-3 years surrounding retirement of the head-of-household) and its interaction with the married indicator. The head of household is defined to be the husband in couple households. Standard errors are heteroskedasticity robust and clustered at the household level. ***Statistically significant at the 1% level, **statistically significant at the 5% level, *statistically significant at the 10% level.