The Effect of Divorce and Marriage on Retirement Decisions

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Abstract

This paper studies how divorce and marriage affect the timing of retirement using self-reported expected retirement ages from the Panel Study of Income Dynamics. In an event-study framework, I find that men's expected retirement ages increase by 1.5 years after marriage and decrease by 1 year after divorce. For women, expected retirement ages decrease by 1 year after marriage and increase by 1.5 years after divorce. In a structural model with retirement decisions and marital status changes, I estimate that the financial benefits of marriage can explain the dynamics of retirement timing for women but not for men.

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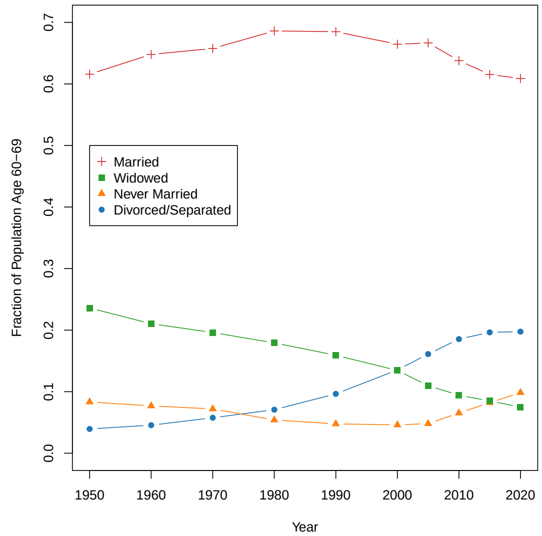
1 Introduction

Over the last several decades, there has been a substantial shift in the marital statuses of older Americans as shown in Figure 1. For those age 60 to 69, the share that are currently divorced or separated has risen to about 20%, and the share that have never married has increased to about 10%. What effect have these changes in marital status had on the timing of individuals' retirement?

Empirically answering this question is challenging because retirement patterns cannot simply be compared across individuals or cohorts. Across individuals, those who marry or divorce may differ in unobservable ways that influence their retirement decisions such as leisure preferences or job opportunities. Across cohorts, changes to Social Security rules and labor market conditions may influence retirement decisions in ways that are not related to marital status. To overcome these challenges, this paper uses data on individuals' planned retirement ages from the Panel Study of Income Dynamics (PSID). By comparing how answers to this question change following a marriage or divorce, it is possible to estimate the effect of these events on the timing of retirement while controlling for unobservable differences across individuals in an event-study framework.

With this empirical strategy, I find that women on average plan to retire one year later following a divorce and one year earlier following a marriage. Additionally, women are substantially more likely to plan to never retire following a divorce, which is consistent with divorce leading to later retirements. For men, planned retirement ages move in the opposite direction compared to women. After a marriage, men on average plan to retire one year later, and there is no statistically significant change in men's planned retirement ages after a divorce. Although I do not find any statistically significant change in planned retirement ages after a divorce, these estimates likely biased toward zero because are likely to immediately retire following a divorce. Overall, the results suggest that the increasing prevalence of never married and divorced individuals will lead to later retirements for women and earlier retirements for men.

Figure 1: Marital Status for Individuals Age 60 to 69 in the United States



Note: This figure shows how the marital status of individuals age 60 to 69 in the United States has changed over time using the 1% Census Samples and American Community Survey (Ruggles et al. [2025]).

If leisure is a normal good, then these patterns in planned retirement ages following marital events would imply that women benefit financially from marriage and are harmed by divorce. To provide additional evidence for this interpretation, I analyze how household expenditure per person changes after marriages and divorces. For men, expenditure per person increases by more following a divorce compared to women and also decreases by more following a marriage. As a result of shared consumption in marriage such as housing, expenditure per persons is expected to increase following a marriage and decrease following a divorce. Because the magnitudes of these changes in household expenditure per person are smaller for women, it suggests that women's underlying consumption rises by more in marriage and falls by more in divorce compared to men. This is consistent with women benefiting more financially from marriage allowing them to retire earlier and being financially harmed more by divorce leading to later retirements.

In addition to financial considerations of marriage, the changes in planned retirement ages may also reflect men specializing in market work while women specialize in home production during marriage. Using information about housework time in the PSID, I find that women have larger increases in housework time following a marriage compared to men, and women also have larger decreases in housework time following a divorce. The increase in housework time for both spouses on average during marriage suggests that home production has a higher marginal value in marriage. Because women on average have larger changes in housework time following a marriage and divorce, this suggests that they specialize more in home production compared to men as a result of cultural gender norms or comparative advantage, which provides an alternative explanation for how marital events influence retirement decisions.

To further explore the mechanisms generating changes in planned retirement ages around marital events, I develop and estimate a model of marriage, divorce, and retirement. In the model, individuals face exogenous shocks to their marital status. Singles make consumption, savings, and retirement decisions to maximize their expected life-time utility, and married couples make joint decisions to maximize the household utility in a unitary framework. During marriage, spouses benefit from economics of scale in consumption that reduce the cost of providing an equivalent consumption level compared to singles. Additionally, the marginal value of retirement can differ when married and single to capture that marital status may affect the value of leisure. After a divorce, individuals pay a financial cost and split their assets with their former spouse.

The model is estimated to match key features of the PSID such as the patterns of planned retirement ages around the time of a marriage and divorce. The estimated matches well the dynamics of women's planned retirement ages around marital events without any difference in the marginal value of retirement while married and single. This suggests that the financial benefits of marriage in the model for women can explain the observed changes in their planned retirement ages. However, the estimated model implies a negative value of retirement in marriage for men, which suggests that the financial considerations of the model cannot explain the observed changes in their planned retirement ages around marital events.

The model also fails to match the patterns of expenditure around the time of a marriage and divorce observed in the data. This failure may result from retirement being modeled as an absorbing state, incorrectly specified consumption sharing in marriage, or selection into both marriage and divorce.

Related Literature The relationship between divorce and contemporaneous labor supply decisions of women in the US context has been studied by several previous papers (Gray [1998], Genadek et al. [2007], Stevenson [2008], Fernández and Wong [2014], Voena [2015], Olivetti and Rotz [2018]). A large part of this literature uses changes in divorce laws across states and time as exogenous variation in divorce rates. In addition to female labor supply, these papers have also considered outcomes including household savings, marital conflict, and child welfare. A related literature considers how legal stipulations following divorce such as alimony and child support affect individuals' decisions. These papers focus on Europe using large administrative data sets (Rossin-Slater and Wüst [2018], Foerster [2024]). Holzer et al. [2005] analyzes how the labor supply of young black men changes in response to child support payments. This paper contributes to this literature by studying the effect of marriage and divorce on male and female retirement decisions using planned retirement ages.

A large literature has also studied the retirement decisions of individuals and couples (see Blundell et al. [2016] for a review). Many of these papers consider male retirement only while spousal income is exogenous (French [2005], **?**, Fan et al. [2024]). Recent papers have also considered the joint retirement decisions of couples (Casanova [2011], Michaud et al. [2020]). However, these papers do not allow for marital status changes such as divorce and remarriage. De Nardi et al. [2025] has considered how widowhood following retirement affects savings decisions for older households. This paper contributes to this literature by considering how divorce and marriage affected planned retirement ages and also constructs a life-cycle model of labor supply with divorce, marriage, and retirement.

Finally, data on subjective expectations and beliefs has been used to study a myriad of topics in previous papers. Manski [2004] argues that these questions provide useful information in addition to observed decisions to make inferences about the economic agent's decision process. Disney and Tanner [1999] use British data to show that self-reported retirement expectations reveal information about an individual's future retirement age that is not captured by other observable characteristics. Chan and Stevens [2004] show that retirement expectations change in response to changes in pension incentives. Brown et al. [2010] use self-reported expectation data to infer the effect of inheritance on retirement decisions. This paper contributes to the literature by using self-reported planned retirement ages to study how marital status changes influence retirement decisions.

2 Data

The main data source for this study is the Panel Study of Income Dynamics (PSID) data from 1999 to 2019 for individuals between the ages of 40 and 60. I restrict to observations after 1999 because this is the first survey where the PSID asks individuals about their planned retirement ages. For many surveys the PSID only asks about planned retirement ages when individuals are over the age of 40, so I restrict to individuals over this age. I restrict to individuals under the age of 60 because relatively few voluntary marital status changes happen after this age and most people will not have retired before this age.[1] I choose to focus on the PSID rather than the Health and Retirement Survey (HRS) because the initial sample in the HRS is individuals between the ages of 50 and 60 plus their spouses. Individuals entering the HRS retire relatively quickly, and there is little time to observe them around the time of a marital status change before they retire. However, patterns similar to those observed in the PSID also exist in the HRS.

Starting in 1999, the PSID asks the head of household and their spouse about their planned retirement age if the individual is participating in a pension or retirement plan

[1] Both the divorce and marriage rate between the ages of 60 and 80 is four times lower than that for ages 40 to 60. After age 60, the death of a spouse also becomes more common but is beyond the scope of this paper.

through their current job or union. Starting in the 2013 survey, individuals also needed to be age 40 or older to be asked this question. The specific wording to the question is:

> *Now I want to ask you about your retirement plans. At what age do you plan to stop working?*

Table 1 reports summary information about responses to this question. Respondents may answer this question in one of three ways: (i) with a planned retirement age (86.2% of respondents), (ii) that they plan to never retire (6.6%), or (iii) that they don't know when they will retire (7.2%). All of these responses will reveal information about how marital status changes influence retirement decisions. I interpret planning to never retire as indicating that the individual is pessimistic about their financial resources for retirement.[2] Answering that their planned retirement ages are unknown will capture if the individual faces significant uncertainty about the decision to retire.

The PSID definition of "pension or retirement plan" does not include Social Security or individual retirement accounts (IRAs) but does include both defined benefit plans and defined contribution plans such as a 401k. For brevity, I use the phrase "pension" to refer to all such on-the-job benefits. Future work may consider if and how different pension rules influence responses to marital status changes.

Studying planned retirement ages has several benefits compared to actual retirement decisions or other observed labor supply decisions. Individuals only retire once, and it may be difficult to control for unobserved heterogeneity such as individual specific preferences for leisure and potential labor income. In contrast, a plan for retirement is a question that

[2] In the PSID, individuals who plan to never retire have worse financial situations compared to individuals who report a planned retirement age as shown in Table 1. In the Survey of Consumer Finances, Zhang and Hanna [2013] finds that individuals who plan to never retire also report lacking sufficient resources to retire. Cobb-Clark and Stillman [2009] find similar patterns in Australian data. These papers are not able to evaluate realized retirement ages for individuals who plan to never retire either because the data is cross-sectional or does not follow individuals long enough to observe actual retirement. In Table 1, I show that planning to never retire is not a persistent response for individuals who are asked about their planned retirement ages in consecutive surveys. For individuals who report planning to never retire today and are also asked about their planned retirement ages, only 30% will again report that they plan to never retire; the other 70% of respondents either switch to reporting a planned retirement age or not knowing their retirement plans.

Table 1: Planned Retirement Ages

	(1) Plan for Retirement is an Age	(2) Plan to Never Retire	(3) Don't Know Plan for Retirement
Percent of Respondents	86.2%	6.6%	7.2%
Same Category Next Period	88.05%	33.37%	24.82%
Female	51.33%	39.63%	50.61%
Age	49.19	49.48	48.5
	(5.77)	(5.86)	(5.61)
Annual Labor Income	\$54,891	\$45,492	\$45,755
	(\$38,653)	(\$39,704)	(\$37,804)
Net Wealth	\$320,443	\$272,728	\$375,992
	(\$1,067,656)	(\$857,821)	(\$989,666)
Net Wealth ≤ 0	9.75%	18.3%	11.04%
Observations	6,686	462	504

Note: This table presents information about responses to the PSID planned retirement ages question for individuals age 40 to 60. Standard deviations are in parentheses.

individuals can answer repeatedly over their lifetime. Comparing an individual's plan for retirement before and after a marital status change will eliminate any individual heterogeneity that does not vary over time. Previous papers such as Disney and Tanner [1999] show that planned retirement ages are strong predictors of when an individual will actually retire; therefore, changes in planned retirement ages will tell us something about when individuals will actually retire.[3] The planned retirement ages question also allows for the study of retirement decisions for individuals who have not yet retired as of the last survey. This allows us to study the future retirement decisions of individuals who have been divorced or married recently as 2018. Studying actual retirement decisions would require studying divorces that happened several decades ago to allow enough time for individuals to reach retirement age.

Retirement decisions as measured by planned retirement ages will show long-run impacts of marital status changes that do not appear in short-run labor supply decisions such as hours worked and labor force participation. Short-run adjustments may also be undetectable in survey data with few observations such as the PSID.[4] Individuals may choose not to adjust their labor supply much around the time of a marital status change but instead adjust their retirement decision some years in the future. This margin may be especially important for full time and salaried workers who are less able to adjust their labor supply in the short run along margins such as hours worked.

While the planned retirement ages question will provide insight about retirement decisions, there are several limitations imposed by the sample selection and wording of the

[3]Evaluating in the PSID how well planned retirement ages predict actual retirement is challenging because the question only began to be asked in 1999; many people who I observe reporting planned retirement ages have yet to retire by the final survey in 2019. The people who are observed both reporting a plan for retirement and actually retiring are more likely to have retired early; the people who retire late are more likely to be still working in the last survey of 2019. It is more suitable to evaluate planned retirement ages in a survey such as the HRS, for which in the original cohort of 1992 the youngest individuals have now reached the age of 80. In the HRS, the initial plan for retirement when entering the survey is a strong predictor of when people actually retire.

[4]For example, Foerster [2024] using Danish administrative data finds that weekly hours worked for men decrease by on average one hour after a divorce. Inference of such small changes is likely not possible in a data set the size of the PSID. In Figures 12 and 13 I show how hours worked change around the time of a marital status change in the PSID. The confidence intervals here are larger than one hour in each direction, but I do observe statistically significant changes for women.

question. Individuals must be *participating* in a pension at their current job or union to be asked about their planned retirement ages. Workers who are either employed at jobs without pensions or do not participate in available pensions, which account for almost half of workers age 40 to 60 in the PSID, will not be asked this question. Because the PSID does not ask about the availability of pension plans on the job, it is also impossible to directly distinguish between non-participation in and non-availability of a pension from the job. Table 2 compares workers participating and not participating in pensions at their current job. Workers participating in pensions at their current job are more likely to work full-time and have higher average earnings. Also, non-participating workers have lower marriage rates and higher divorce rates. Results from analysis using the PSID sample of those answering the planned retirement ages question may not be representative of effects for the entire population.

Marital status changes may influence or be associated with an individual's decision to work, to search for jobs with pension plans, and to participate in available plans. Changes along these margins will cause changes in who is asked about their planned retirement ages in the PSID and may bias my estimates for how planned retirement ages respond to marital status changes. Therefore, I consider how employment rates and participation in pension plans change around the time of a marital status change to ascertain whether such bias exists and its potential magnitude.

In addition to the issue of sample selection, different individuals may interpret the phrase "stop working" in the question in different ways. In retirement, some individuals stop working and never return to the labor force. Others transition from a serious full time job to a part-time job or will return to the labor force in the future.[5] Exactly how each individual interprets this question is unclear, and no follow-up questions provide insights. I take as given that individuals will interpret the question literally; the planned retirement age is the age until which they will work and then never work thereafter.

[5]See Gonzales [2013] for a discussion of reverse retirement behavior. Munnell et al. [2021] discusses "bridge jobs" where individuals transition to a non-traditional job at older ages before fully retiring.

Table 2: Characteristics of Workers Aged 40 to 60

	(1) Not Participating in Pension Plan	(2) Participating in Pension Plan
Defined Benefit Plan	–	48.94%
Female	53.31%	49.54%
Married	74.5%	79.29%
Marriage Rate	6.10%	6.25%
Divorce Rate	2.89%	2.28%
Participating Two Years Ago	16.74%	81.85%
Age	48.92 (5.79)	49.12 (5.69)
Survey Year	2009.02 (6.14)	2008.74 (6.17)
Labor Income	\$32,640 (\$84,913)	\$58,498 (\$39,723)
Hours per Week	39.21 (14.86)	43.62 (9.38)
Observations	5,217	6,460

Note: This table presents summary information about individuals age 40 to 60 in the PSID from 1999 to 2019 who were working at the time of the survey. Standard deviations are in parentheses.

I define a couple in the PSID as married based on whether they are living together rather than their legal marital status. The beginning of the marriage is defined as the survey when a couple begins living together, and divorce is defined as the survey when a couple stops living together. This definition is used for two main reasons. First, potential benefits of marriage such as shared consumption and home production exist when a couple is living together regardless of whether that couple is legally married. Second, the legal process of marriage and divorce may only be finalized some time after the couple has decided to marry or divorce.[6] Couples should update their beliefs and decisions when they begin or stop living together if this is a strong predictor of future legal marital status changes. There are several limitations to defining marriage based on cohabitation. Legal fees from divorce proceedings would not be required for ending a cohabiting relationship, and the spousal benefit from Social Security would not be available without a legal marriage. The end of a legal marriage also introduces other possible constraints such as alimony and child support discussed in previous papers.[7]

Table 3 explains the steps in the sample selection process for the PSID regression analysis starting from an original sample of all heads of households and their spouses who are between the age of 40 and 60. Each row lists a step in the sample selection and how many person-year observations remain after each step for the sample of all individuals, individuals who divorce between age 40 and 60 ("Ever Divorced"), and individuals who marry between ages 40 and 60 ("Ever Married"). In the final sample containing individuals who report a planned

[6] Sterling Law Offices advises clients that typical divorce proceedings in Wisconsin, for example, can take six months to a year to finalize. Some cases may take several years if the spouses cannot agree on issues such as child custody and asset divisions. In addition, some states and countries have mandatory waiting periods. Wisconsin for example has a 120-day mandatory waiting period before a final hearing. https://www.sterlinglawyers.com/wisconsin/divorce/how-long-divorce-wisconsin/

[7] Alimony in the United Sates is not particularly common. Voena [2015] in the NLSY from 1977 to 1999 finds that less than 10% of divorced women receive alimony. Peters [1986] finds that alimony payments correspond to less than 3% of average male earnings. Child support in the US is more common, but the sample of marital status changes considered here is individuals between the ages of 40 and 60. These couples are less likely to have children, and any children are likely to be older; child support payments will then expire sooner. Several studies find that post-marriage support payments do have effects on labor supply (Holzer et al. [2005] and Foerster [2024]). Future work should consider how legally stipulated support payments after divorce impact retirement decisions.

retirement age, there are 5,173 individuals of which 523 divorce and 727 marry at some point in the sample. These are not mutually exclusive groups as 211 individuals experience both a divorce and a marriage.

Table 4 reports summary statistics for the final PSID sample who report a planned retirement age. The sample of divorcing individuals who report a planned retirement age is only 43% male, while the overall sample is 49% male. This suggests divorcing men are less likely to satisfy the PSID selection for being asked about planned retirement ages (i.e. employed and participating in pension plan) compared to divorcing women. The average age of individuals when they experience divorce and marriage is 47, but a standard deviation greater than 5 for both samples indicates that both events happen at a wide range of ages between 40 and 60. Both planned retirement ages across the population and changes in planned retirement ages for individuals have large standard deviations. These large standard errors show that individuals make frequent and large changes to their planned retirement ages, which may be a result of substantial uncertainty in retirement decision-making. Individuals who get divorced or married in the sample have a roughly 5% higher variance of changes in planned retirement ages.

3 Descriptive Evidence

This section describes how planned retirement ages, labor supply, and other household decisions vary before and after a marital status change. Similar to Foerster [2024], I estimate the following event-study regression for individual i at time t:

$$y_{it} = \sum_{\tau=-3}^{3} \alpha_\tau D_{it+\tau} \quad + \sum_{\tau=-3}^{3} \beta_\tau M_{it+\tau} + \theta X_{it} + age_{it} + f_i + \varepsilon_{it}. \tag{1}$$

In this equation, y_{it} is the outcome of interest such as planned retirement ages and other household decisions; $D_{it+\tau}$ and $M_{it+\tau}$ are indicators for whether the individual gets divorced or married in survey s; X_{it} is a vector of controls that can vary over time for the individual;

Table 3: Sample Selection

	(1) Sample	(2) Individuals	(3) Observations
1.) Original Sample	All	12,021	57,527
	Ever Divorced	1,170	7,368
	Ever Married	2,130	10,118
2.) Drop if Missing Labor Income	All	11,677	53,858
	Ever Divorced	1,161	670
	Ever Married	2,032	9,352
3.) Multiple Observations	All	9,696	51,877
	Ever Divorced	1,091	6,900
	Ever Married	1,683	9,003
4.) Not Multiple Divorces or Marriages	All	9,419	49,960
	Ever Divorced	895	5,432
	Ever Married	1,408	7,101
5.) Asked Planned Retirement (PR)	All	7,263	26,002
	Ever Divorced	717	2,762
	Ever Married	1,093	3,606
6.) Answered PR with Age	All	6,686	22,176
	Ever Divorced	671	2,321
	Ever Married	992	2,975
7.) PR Less Than 81	All	6,675	22,135
	Ever Divorced	670	2,313
	Ever Married	991	2,969
8.) PR Greater than Age	All	6,672	22,090
	Ever Divorced	670	2,309
	Ever Married	990	2,962
9.) Multiple Observations	All	5,173	20,591
	Ever Divorced	523	2,162
	Ever Married	727	2,699

Note: This table lists the steps in the PSID sample selection process as well as how many individuals and observations remain after each step.

Table 4: Summary Statistics

	(1) All	(2) Divorce Sample	(3) Marriage Sample
Individuals	5,173	523	727
Observations	20,591	2,162	2,699
Female	51.47%	57.03%	49.13%
Age	49.26	49.11	49.32
	(5.7)	(5.46)	(5.46)
Age at Event	–	46.84	46.95
		(5.08)	(5.27)
Planned Retirement Age (PR)	62.53	62.74	62.46
	(4.76)	(5.1)	(5.05)
Change in PR	0.3	0.48	0.26
	(3.96)	(4.23)	(4.36)

Note: This table lists summary statistics for the final sample selection of the PSID: individuals age 40 to 60 who report their planned retirement ages as an age. Standard deviations are in parentheses.

age_{it} are fixed effects for age; and f_i is fixed effects for each individual. Because the regression includes age fixed effects, the changes in the coefficients α_τ and β_τ capture deviations from the life-cycle profile of the outcome variable τ periods relative to marriage and divorce, respectively. The coefficients α_τ and β_τ are normalized by adding the average of the considered outcome in the period prior to the marital status change (i.e. $\alpha_{-1} = \mathbf{E}\left[y_{it}|D_{it+1} = 1\right]$ and $\beta_{-1} = \mathbf{E}\left[y_{it}|M_{it+1} = 1\right]$).

Because of the relatively small number of marital status changes that I observe in the data, I include all individuals in the sample whether they have experienced a marital status change or not. In order for this regression to be properly identified, individuals who do not experience any marital status changes must act as a suitable control group for individuals who experience marital status changes by following similar trends across age and time. If this is true, then the coefficients α_τ and β_τ prior to the marital status change (i.e. $\tau < 0$) should be similar, and any differences should be statistically insignificant. Even if individuals who experience marital status changes and those who do not follow similar trends across age and time, it is still possible that another event causes both the marital status change and the change in the outcome variable. For example, financial problems for a couple may cause both a divorce and a change in planned retirement ages. To help control for these factors, I include in the vector X_{it} indicators for an individual's and their spouse's unemployment events and health status. Additionally, if the regression sample contains only individuals who are employed, as it will for the planned retirement ages outcomes, I include the log of labor income as well as the income ratio of the spouse to the individual.

The outcomes of interest include whether the individual reports an unknown plan for retirement, plans to never retire, and planned retirement ages; labor supply decisions such as whether the individual is employed, participating in a pension plan, and weekly hours worked; and other household decisions such as expenditure and housework. The planned retirement ages variables will inform how marital status changes impact retirement decisions. The labor supply variables will inform not only how labor supply is changing around the time of marital status changes but also the selection into who is answering the planned retirement ages question. Additional household decisions will help inform why individuals are adjusting their planned retirement ages after marital status changes.

Because males and females may respond differently to marital status changes, I estimate equation 1 separately by sex. In section 4.3, I discuss what characteristics sex is a proxy for in this context.

3.1 Planned Retirement Ages

For the sample of all individuals asked about their planned retirement ages, I first consider as binary outcomes whether the individual reports that their plan for retirement is unknown (Figures 2 and 3) and whether the individual plans to never retire (Figures 4 and 5). Because of large standard errors, I do not observe any clear and statistically significant patterns in reporting an unknown planned retirement age; it is still possible that marital status changes create additional uncertainty for individuals that is not precisely estimated here. In contrast, divorce is associated with an increased likelihood of planning to never retire. Men's probability of planning to never retire begins to increase in the survey before divorce; compared to two surveys before divorce, men's probability of planning to never retire increases by 8 percentage points at the survey of divorce and remains elevated thereafter. Women similarly are more likely to report planning to never retire after divorce; between the survey before and after divorce, women's probability of planning to never retire increases by 8 percentage points but eventually returns to levels similar to before the divorce. Compared to the sample average of 6.6% of respondents planning to never retire, these are large changes. As mentioned in Section 2, individuals who report planning to never retire have fewer financial resources and are more likely to report lacking financial resources for retirement. This increase in plans to never retire around the time of divorces suggests that divorce has a negative impact on financial resources for retirement. It is easier to interpret this relationship as causal for women who do not exhibit a pre-trend; men who get divorced on the other hand do not satisfy the parallel trend assumption.

Figures 6 and 7 present how individuals' planned retirement ages change after a marital status change. A clear picture emerges about how marital status changes impact women's retirement decisions. Women's planned retirement ages increase by one year. In contrast, women who get married decrease their planned retirement ages by one year. A less clear picture exists for men. Men's planned retirement ages are stable immediately after marriage but then increase two surveys later. After divorce men's planned retirement ages are also stable except for a decline one survey after divorce that immediately rebounds. Compared to women, men's planned retirement ages are less responsive to marital status changes. Any changes, though, go in the opposite direction compared to women.

Table 5 presents the control variables that are included in equation 1 with planned retirement ages as the outcome. Increasing labor income has a negative effect on planned retirements ages for both men and women. Higher labor income will increase the Social Security benefit available to the individual and also allow them to save more for retirement. The magnitude of this effect is rather small. A 1% increase in labor income would decrease planned retirement ages by 0.007 years for men and 0.005 years for women. The income ratio of the spouse to the individual does not have a statistically significant effect on planned retirement ages. Unemployment and work limitations for both the spouse and the individual have negative effects on planned retirement ages, but all of these coefficients are statistically insignificant.

3.2 Employment and Pension Participation

Individuals are only asked about their planned retirement ages in the PSID if they are employed and participating in a pension program at their job. To understand the selection into answering the planned retirement age question, I consider how employment and pension participation change around the time of marital status changes as shown in Figures 8 to 11. Results here show that the composition of individuals asked about their planned retirement

Figure 2: The Effect of Marriage on Not Knowing Planned Retirement Age

Men (Left) and Women (Right)

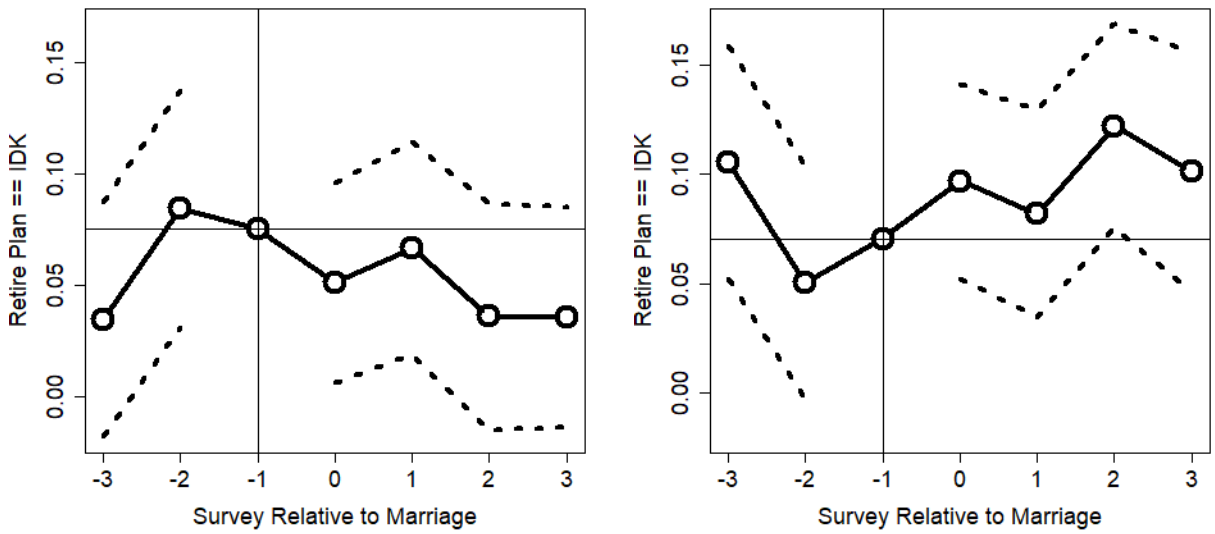
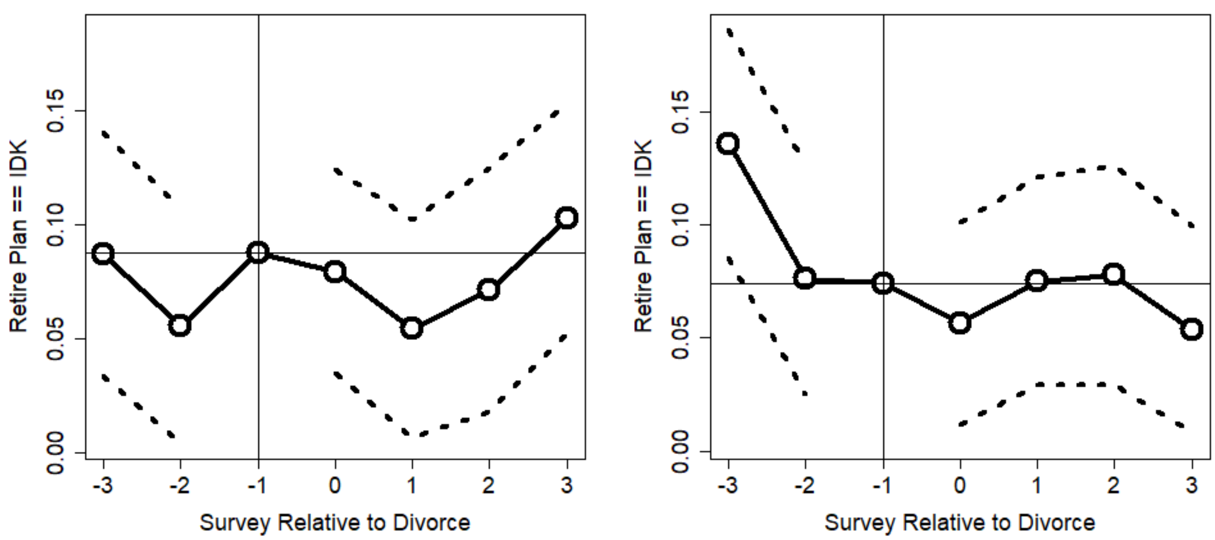


Figure 3: The Effect of Divorce on Not Knowing Planned Retirement Age

Men (Left) and Women (Right)



Note: Figures 2 and 3 present the estimated coefficients α_τ and β_τ from equation 1 when the outcome variable is whether individual reported an unknown plan for retirement. Dotted lines are 90% confidence intervals with standard errors clustered by individual.

Figure 4: The Effect of Marriage on Planning to Never Retire

Men (Left) and Women (Right)

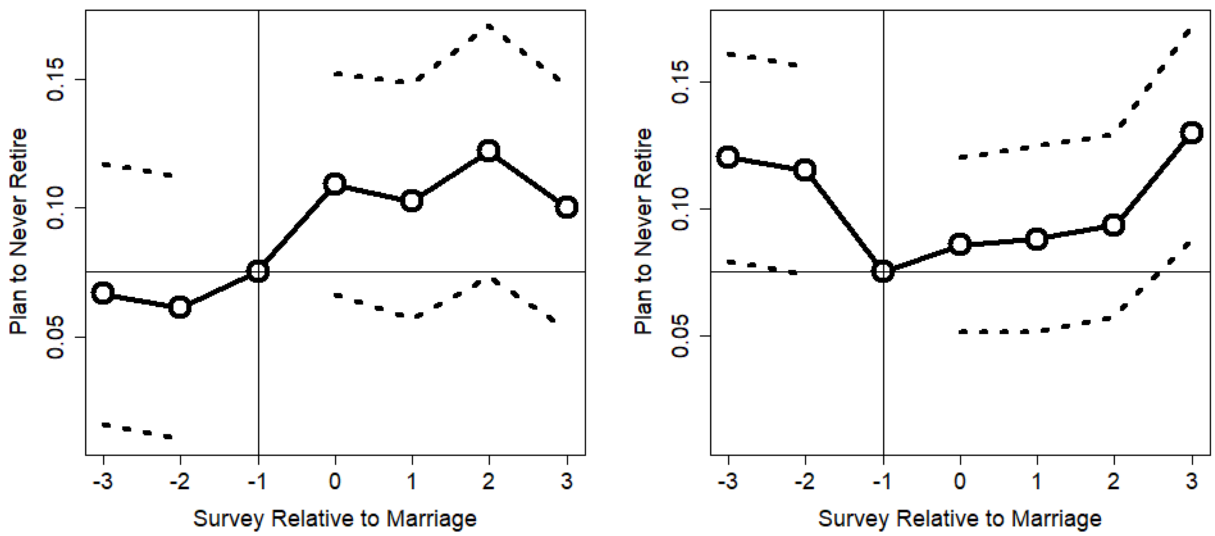
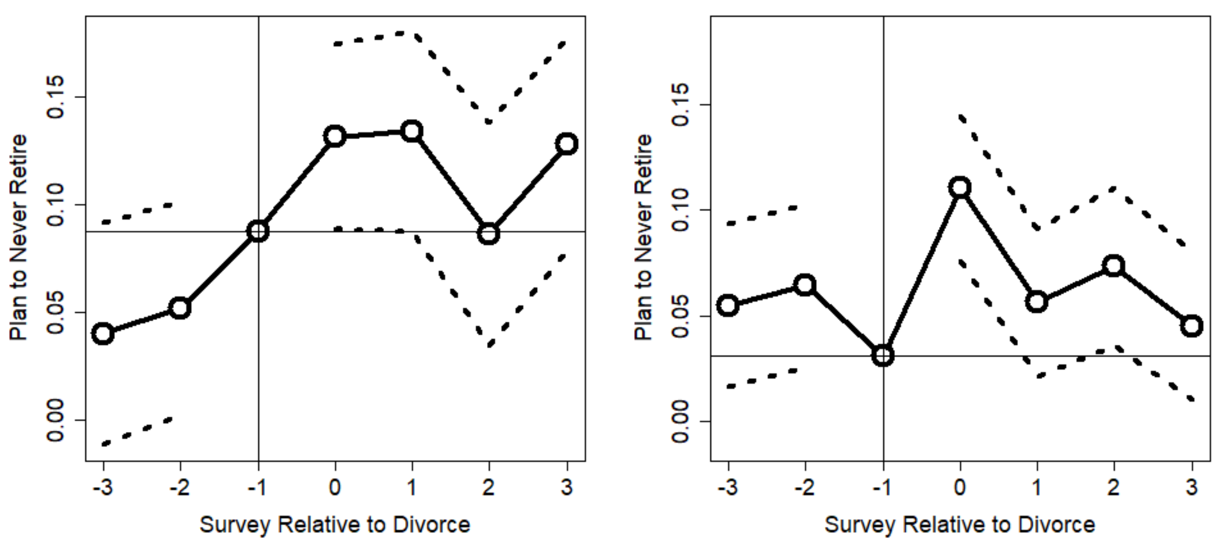


Figure 5: The Effect of Divorce on Planning to Never Retire

Men (Left) and Women (Right)



Note: Figures 4 and 5 present the estimated coefficients α_τ and β_τ from equation 1 when the outcome variable is planning to never retire. Dotted lines are 90% confidence intervals with standard errors clustered by individual.

Figure 6: The Effect of Marriage on Planned Retirement Ages

Men (Left) and Women (Right)

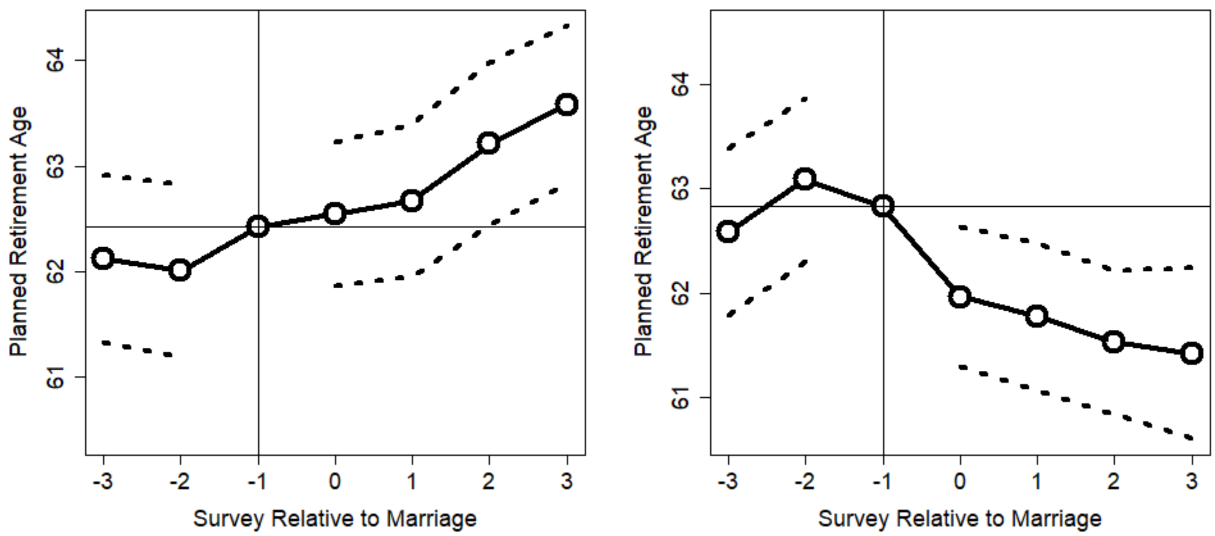
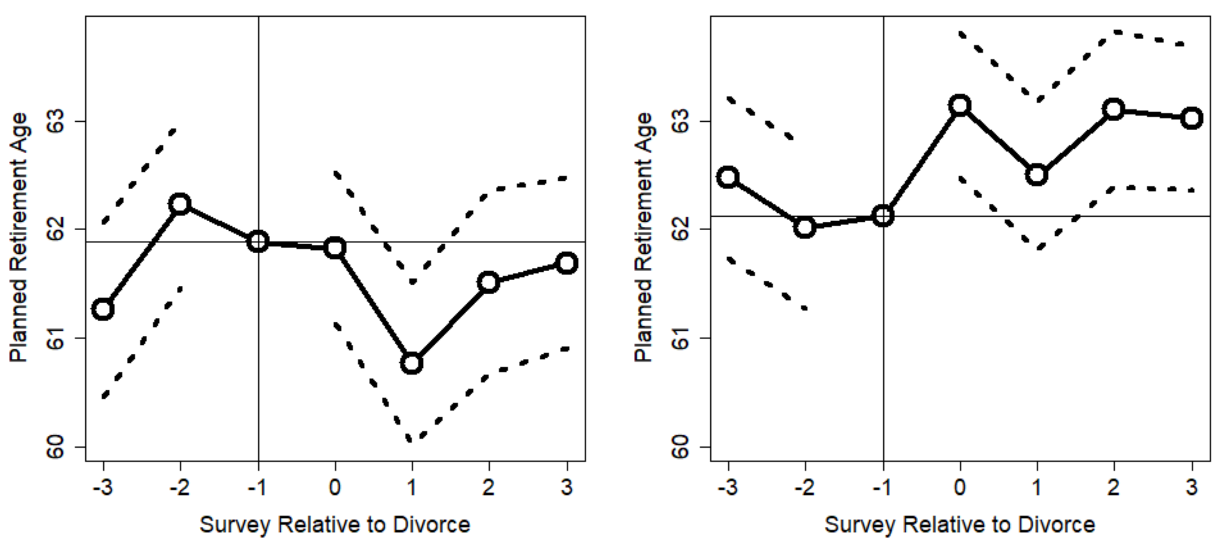


Figure 7: The Effect of Divorce on Planned Retirement Ages

Men (Left) and Women (Right)



Note: Figures 6 and 7 present the estimated coefficients α_τ and β_τ from equation 1 when the outcome variable is planned retirement ages. Dotted lines are 90% confidence intervals with standard errors clustered by individual.

Table 5: Relationship Between Planned Retirement Ages and Control Variables

	Dependent variable:	
	Planned Retirement Age	
	(1)	(2)
Log(Labor Income)	-0.762	-0.543
	(0.115)	(0.098)
Spousal Income Ratio	-0.683	0.175
	(0.607)	(0.460)
Unemployment	-0.068	-0.031
	(0.397)	(0.353)
Spouse Unemployment	-0.033	-0.402
	(0.307)	(0.342)
Work Limit	-0.272	-0.028
	(0.188)	(0.172)
Spouse Work Limit	-0.159	-0.105
	(0.166)	(0.176)
Gender	Men	Women
Ind. FE	Yes	Yes
Age FE	Yes	Yes
Observations	9,956	10,532
R^2	0.700	0.683

Note: This table presents the estimated coefficients on the control variables X_{it} from equation 1 when the outcome variable is planned retirement ages. The PSID sample is step 9 from Table 3. Standard errors in parentheses are clustered by individual.

Figure 8: The Effect of Marriage on Employment

Men (Left) and Women (Right)

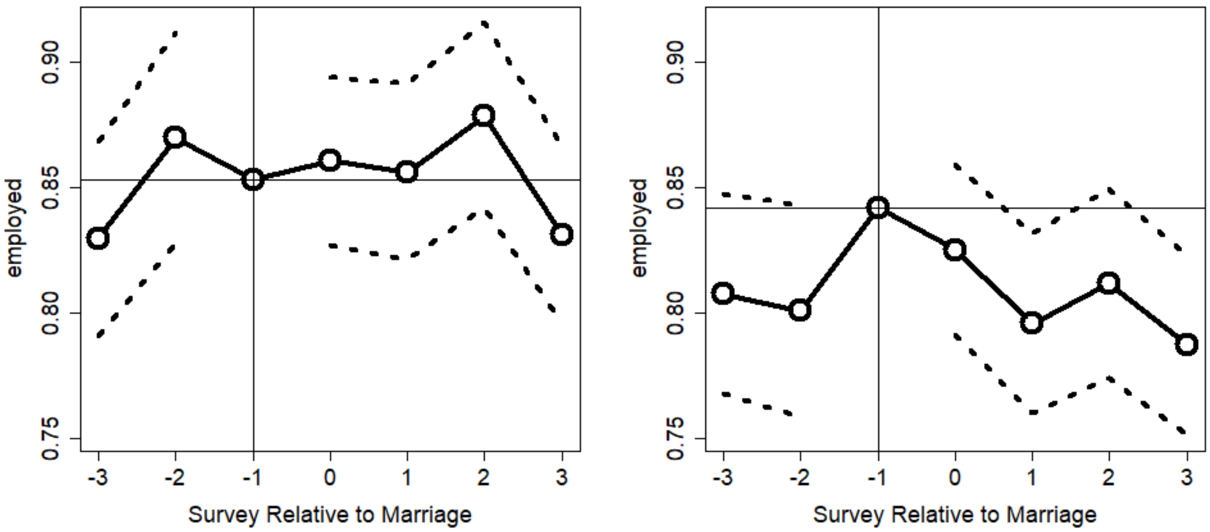
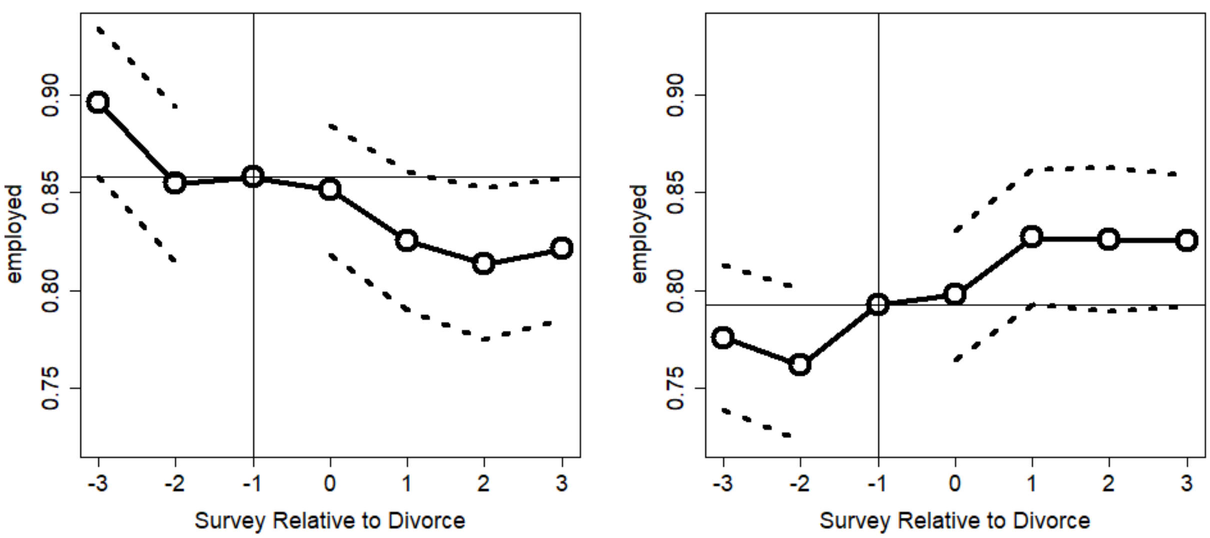


Figure 9: The Effect of Divorce on Employment

Men (Left) and Women (Right)



Note: Figures 8 and 9 present the estimated coefficients α_τ and β_τ from equation 1 when the outcome variable is an indicator for employment. Dotted lines are 90% confidence intervals with standard errors clustered by individual.

Figure 10: The Effect of Marriage on Being Employed with a Pension Plan

Men (Left) and Women (Right)

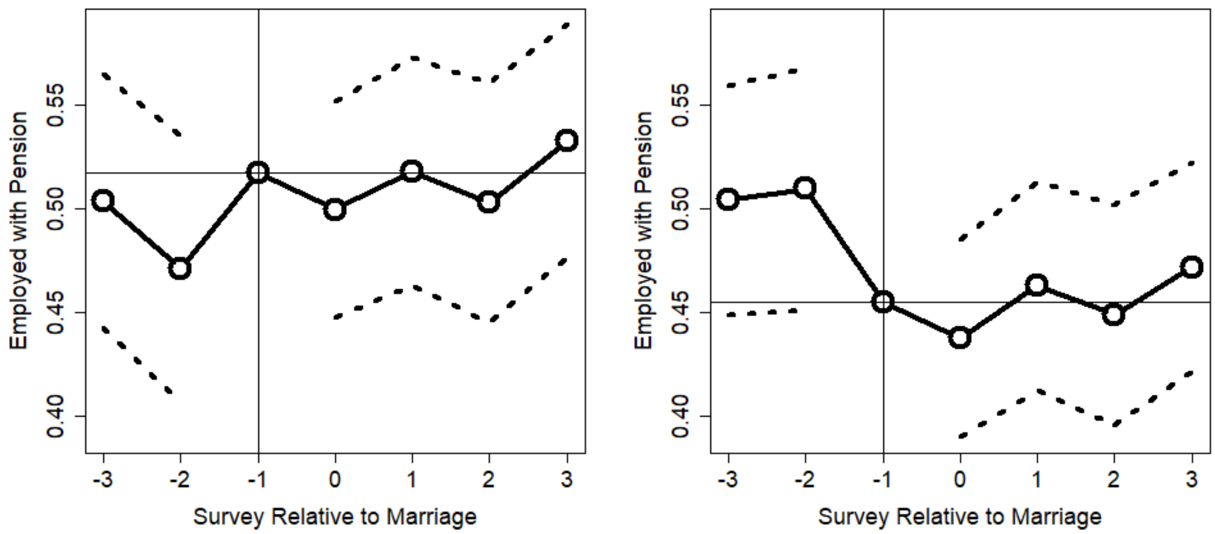
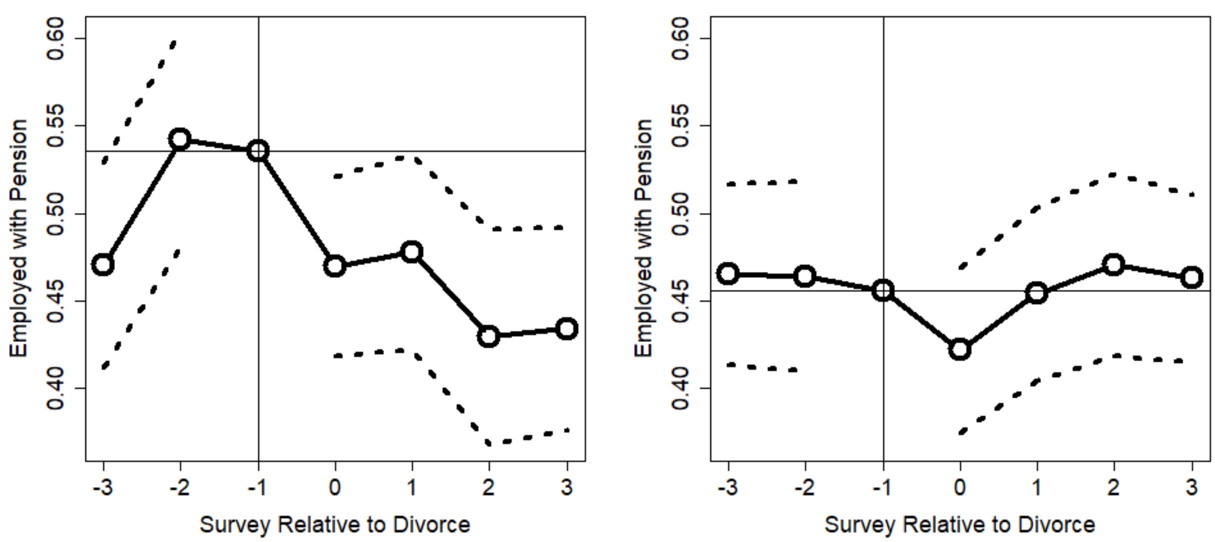


Figure 11: The Effect of Divorce on Being Employed with a Pension Plan

Men (Left) and Women (Right)



Note: Figures 10 and 11 present the estimated coefficients α_τ and β_τ from equation 1 when the outcome variable is an indicator for being employed with a pension plan. Dotted lines are 90% confidence intervals with standard errors clustered by individual.

Figure 12: The Effect of Marriage on Hours Worked

Men (Left) and Women (Right)

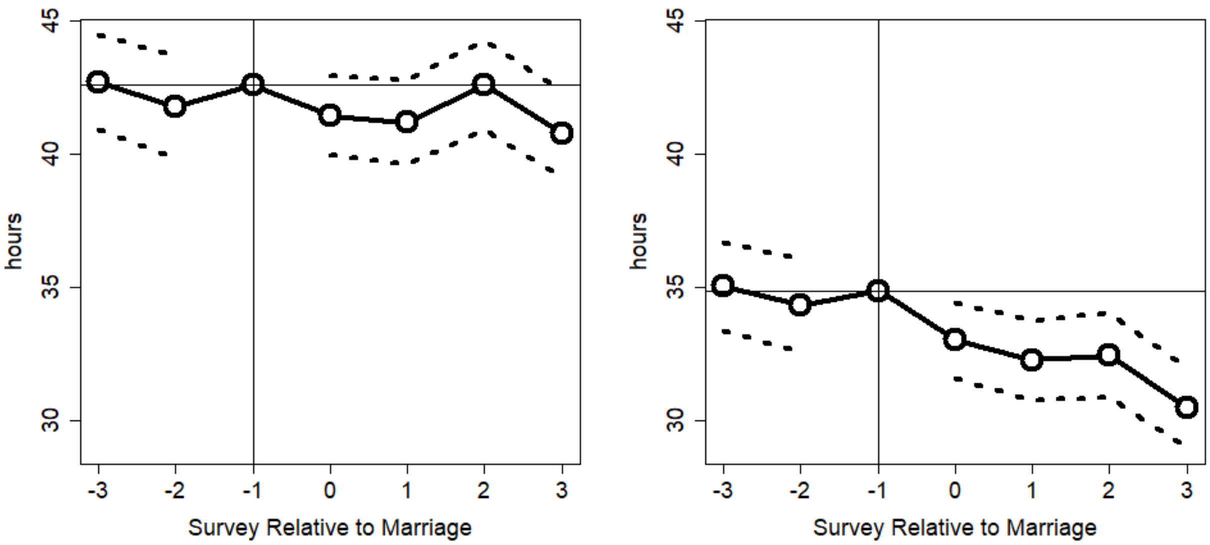
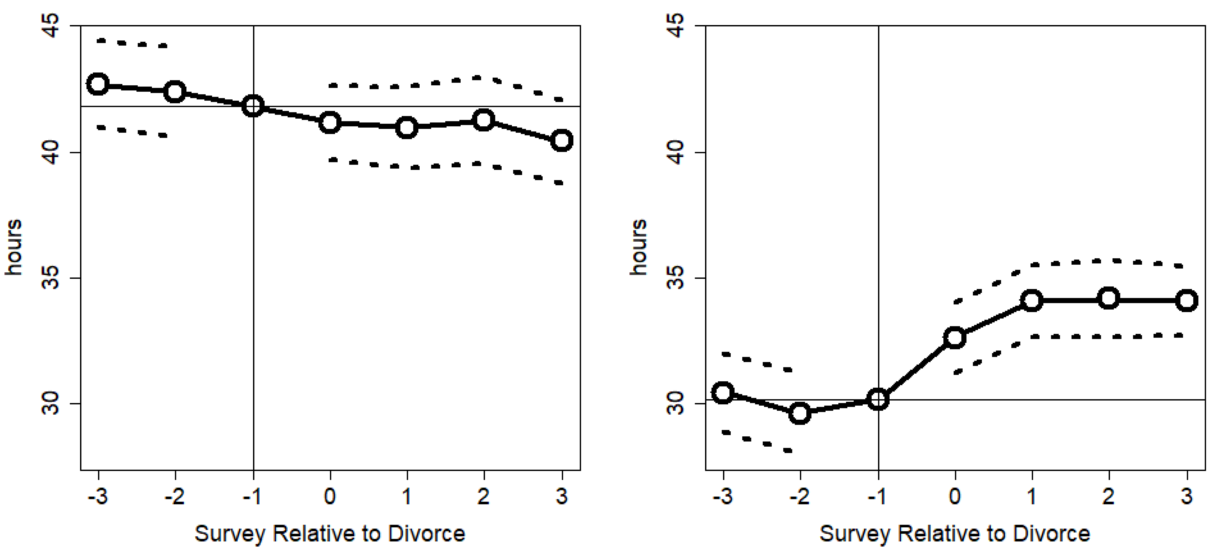


Figure 13: The Effect of Divorce on Hours Worked

Men (Left) and Women (Right)



Note: Figures 12 and 13 present the estimated coefficients α_τ and β_τ from equation 1 when the outcome variable is weekly hours worked. Dotted lines are 90% confidence intervals with standard errors clustered by individual.

ages changes around the time of marital status changes, which may bias the results about planned retirement ages. I discuss these potential concerns here.

Women's employment rate is 4 percentage points higher in the survey prior to marriage relative to other periods; their employment rate also begins rising in the survey prior to divorce and is 6.3 percentage points higher after the divorce. These changing trends in employment for women coincide with the changes in planned retirement ages in the previous section. Divorce increases women's labor supply leading to higher employment rates and later retirements; marriage leads to lower employment rates and earlier retirement. Women's pension participation is also lower after marriage; one way to interpret this decline is that women's financial situation has improved after marriage, and thus they need to save less to finance their retirement. Marital status changes have a consistent effect women's employment rates, pension participation, and planned retirement ages, so the estimated effects on planned retirement ages should not be biased.

Men's employment rate is relatively constant around the time of marriage but declines by 4.5 percentage points after divorce. After divorce men's pension participation conditional on being employed declines steeply by 10.5 percentage points relative to the period before a divorce but remains relatively constant around the time of marriage. The declining employment rates and pension participation of men after divorce may be the result of earlier retirement; these men may have accumulated enough financial resources to retire at the time of divorce, and so stop working and saving through their pension plans. Because divorce leads to some immediate retirement for men, estimates of the changes in planned retirement ages will be biased upwards as these plans do not capture the men who change their plan to retire immediately.

3.3 Expenditure and Housework

In this section, I analyze how other household decisions change after marital status changes to motivate mechanisms for why retirement decisions respond to marital status changes. The previous two sections provide evidence that marital status changes differentially affect labor supply decisions of men and women. Women exhibit increasing labor supply after divorce in the form of planning to retire later and higher employment rates along with corresponding decreases in labor supply after marriage. Men's labor supply increases after marriage with later planned retirement ages and decreases after divorce with declining employment rates. One potential interpretation of this is that there is specialization within the household.[8] Based on observed labor supply patterns, in marriage men appear to specialize in labor market production while women may then specialize in home production.

To test for specialization in the household, I consider how the household expenditure and hours of housework change around the time of a marital status change. The spouse who specializes in labor market production should be able to maintain higher levels of household expenditure per person after a divorce and increase their home production time. In contrast, the spouse who specializes in home production should decrease their home production time and have lower levels of household expenditure per person after divorce.

Figures 14 and 15 show how expenditure per person changes for men and women around the time of marital status changes. The household expenditure per person of men declines by about 25% after a marriage, while it declines by only 15% for women. These declines do not suggest that household *consumption* decreases after marriage because spouses can now share some consumption such as a housing and appliances.[9] The fact that women's expenditure per person decreases by less than men's is evidence that women's consumption increases in marriage more so than men's. A similar story exists after divorce; men's expenditure per person increases by 20% while women's expenditure per person increases by only 10%. Again, this is not to say that consumption increases after divorce because now the separate spouses cannot share any consumption. The fact that men's expenditure increases by more than women's is evidence that men's consumption is less negatively impacted by divorce. These

[8] See Becker [1965] or Pollak [2013] for a discussion of household specialization

[9] The McClements Equivalence scale is meant to capture how the price of consumption differs based on the number of individuals in the house. According to this scale, a single man must spend 61% of what a married couple spends to reach the same consumption level as a married man

patterns in expenditure provide further evidence that men specialize in the labor market during marriage and have a better financial situation after divorce compared to women.

Figures 16 and 17 show how housework hours per week change around the time of a marital status change. Women's housework increases after marriage while men's housework is relatively flat despite a dip in the survey prior to marriage. The fact that women's housework increases after marriage while men's housework does not is evidence that women specialize in home production. Because men's housework time is relatively constant, combine housework hours time increases after marriage. Both men's and women's housework time declines after divorce, so combined housework time falls outside of marriage. These patterns in combined housework hours are evidence that home production is a non-rival good that can be consumed by both spouses, increasing its marginal value in marriage and decreasing it after divorce.[10]

4 Model

To better understand how marital status changes influence retirement decisions, I construct and estimate a structural life-cycle model of marriage, divorce, and retirement that combines elements of models in Casanova [2011] and Voena [2015]. To match the wording of the PSID planned retirement ages question, which refers to retirement as the "age you plan to stop working", I model retirement as an absorbing state.

There are two types of individuals, male (M) and female (F), who differ in their preference for leisure, income process, and Pareto weight when married to each other. Marriage primarily acts through the budget constraint as a married couple combines their income to finance individual consumption; marriage also influences the available Social Security benefit and consumption production function. In addition to these financial considerations, I also allow for the marginal value of leisure to vary between single and married individuals to

[10]This is in contrast to results from Foerster [2024] who estimates in cross-section Danish time use data that married women and single women do similar levels of housework while single men do more housework compared to married men.

Figure 14: The Effect of Marriage on the Logarithm of Expenditure per Person

Men (Left) and Women (Right)

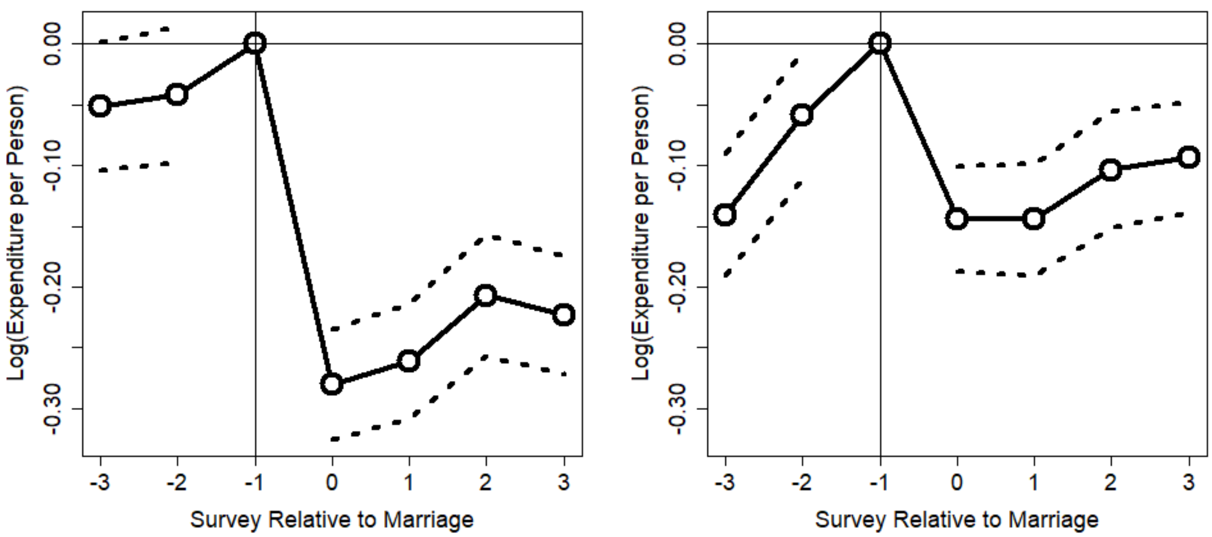
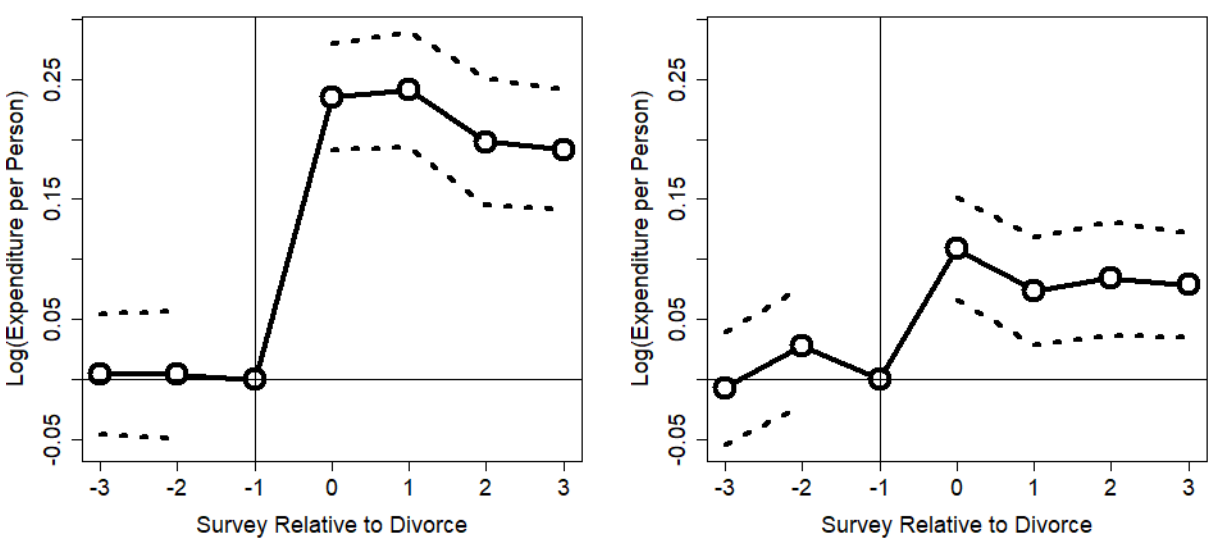


Figure 15: The Effect of Divorce on the Logarithm of Expenditure per Person

Men (Left) and Women (Right)



Note: Figures 14 and 15 present the estimated coefficients α_τ and β_τ from equation 1 when the outcome variable is the log of expenditure per person. Dotted lines are 90% confidence intervals with standard errors clustered by individual.

Figure 16: The Effect of Marriage on Housework

Men (Left) and Women (Right)

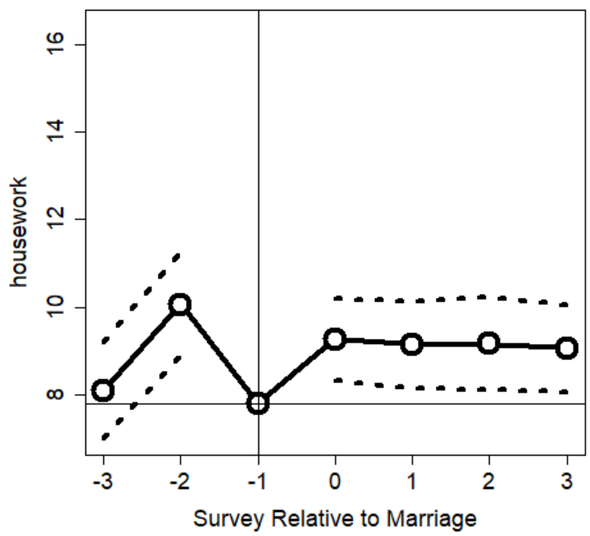
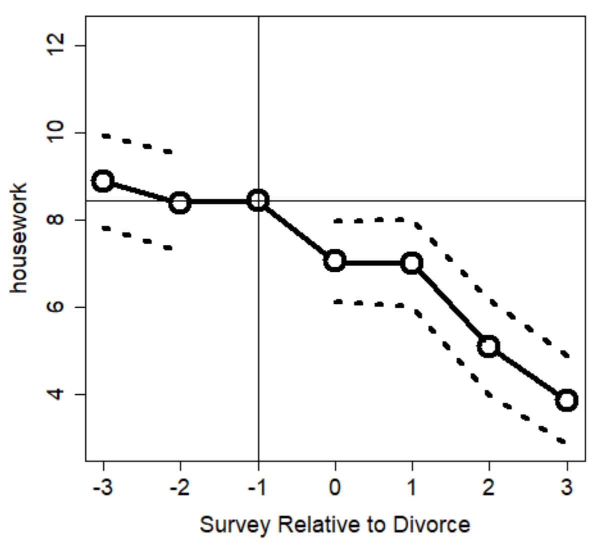


Figure 17: The Effect of Divorce on Housework

Men (Left) and Women (Right)



Note: Figures 16 and 17 present the estimated coefficients α_τ and β_τ from equation 1 when the outcome variable is weekly hours of housework. Dotted lines are 90% confidence intervals with standard errors clustered by individual.

capture the changing marginal value of home production in marriage.

A household is either a single individual or a married couple and face a random probability of transitioning between marriage and divorce. In divorce the spouses split any assets evenly and pay a financial cost. The model begins at age 41 for men and 39 for women; in marriage the male spouse is always two years older than the female.[11] Death happens with certainty at age 81 for females and age 83 for males.

4.1 Preferences

An individual of type $j \in \{M, F\}$ has preferences over their own consumption c_{jt}, their own retirement status $R_{jt} \in \{0, 1\}$ equal to 1 if they are retired, and their marital (nuptial) status $N_{jt} \in \{0, 1\}$ equal to one if they are married. Retirement is assumed to be an absorbing state where individuals always work prior to retirement and can never work following retirement. I assume that the utility function is constant relative risk aversion and separable in consumption and retirement status. Preferences are represented by the utility function:

$$u_j(c_{jt}, R_{jt}, M_{jt}) = \frac{c_{jt}^{1-\gamma}}{1-\gamma} + \psi_j R_{jt} + \kappa_j R_{jt} N_{jt}. \tag{2}$$

In this framework, ψ_j captures the marginal value of retirement to the individual when the individual is single, which includes both leisure time and home production such as housework. The term κ_j captures how the marginal value of retirement changes for the individual when they are married. If home production is a common household good, then the marginal value of retirement may be larger in marriage and $\kappa_j > 0$. Conversely, diminishing returns to home production may cause a lower marginal value of retirement in marriage, so $\kappa_j < 0$.

[11] Having a single age difference between spouses is common in models of married couples (Voena [2015], Foerster [2024], Fernández and Wong [2017], De Nardi et al. [2025]). The average age difference between spouses in my PSID data is 1.5 years, but there is a large variance

4.2 Labor Income

The labor income of individual $j \in \{M, F\}$ at time t depends on their age as well as a random component Z_{jt}. The age profile of labor income as well as the random process may differ for males and females. Labor income for individual j at time t is given by the following equation:

$$\log(Inc_{jt}) = G_j(age_{jt}) + Z_{jt}. \tag{3}$$

The component Z_{jt} follows a random walk over time defined by the following process:

$$Z_{jt} = Z_{jt-1} + \zeta_{jt}, \quad \zeta_{jt} \sim N(0, \sigma_j^2). \tag{4}$$

In this model it is assumed that this random process is not correlated between married spouses, so ζ_{Mt} and ζ_{Ft} are independent.

4.3 Social Security

Individuals accumulate a Social Security benefit (ssb_{jt}) based on the average indexed monthly earnings over their working life ($AIME_{jt}$). The formula mapping $AIME_{jt}$ to the Social Security benefit comes from Casanova [2011] and is described in the appendix. For simplicity, I assume that individuals cannot claim a Social Security benefit until age 65. In the actual Social Security System, individuals may claim a reduced benefit starting at age 62; if they delay claiming the benefit past the age of 65, their benefit increases. The decision to claim the Social Security benefit is also not explicitly modeled. If an individual is currently not retired, then they will not claim the Social Security benefit. If retired they will receive the Social Security benefit they are entitled to. In the model just as in the actual Social Security system, a married individual may claim a Social Security benefit based on their own $AIME_{jt}$ or a spousal benefit based on their spouse's $AIME_{-jt}$. The spousal Social Security benefit is equal to 50% of the spouse's benefit, and an individual receives whichever benefit is largest between their own benefit and the spousal benefit.

The actual Social Security system allows divorced individuals to claim the spousal benefit from a previous marriage if the marriage lasted for at least ten years. If a divorced individual remarries, then they can only claim the spousal benefit from the current marriage and not from any previous marriage. For simplicity this component of the Social Security system is not included in the model, and divorced individuals in the model only receive a Social Security benefit based on their own $AIME_{jt}$. Allowing divorced individuals to claim the spousal benefit would complicate the model in several ways. First, length of the marriage would become a state variable in the maximization problem for both a married couple and divorced individual. The previous spouse's $AIME_{jt-1}$, retirement decisions R_{jt-1}, and random component Z_{jt-1} would also become state variables for a divorced individual. An individual's decisions would also depend on their spouse's current decisions; since divorced individuals are unlikely to act cooperatively, some non-cooperative structure would be needed here. Nevertheless, the loss of the spousal Social Security benefit following divorce may be an important mechanism by which divorce influences retirement decisions for marriages longer than ten years.[12] Individuals who divorce from marriages of longer than ten years may adjust their retirement ages less following a divorce.

4.4 Budget Constraint

Married couples combine their available cash on hand which depends on the spouses' retirement decisions R_{jt}, labor income Inc_{jt}, Social Security benefit ssb_{jt}, and previous joint savings s_t.[13] Based on the available cash on hand, the couple then decides individual consumption levels c_{jt} and joint savings s_{t+1}. Denote by x_t the total expenditure on consump-

[12]Research has found that the ten-year mark is not influential in divorce and remarriage decisions (Goda et al. [2007]). It is still possible that crossing this threshold is important for retirement decisions.

[13]The labor income Inc_{jt} is a function of the individual's age and random component as in equation (3). The Social Security benefit is a function of the average indexed monthly earnings $AIME_{jt}$ for each spouse and age as explained in section 5.3. It might be more appropriate to explicitly write these as functions (i.e. $Inc_{jt}(Age_{jt}, Z_{jt})$ and $ssb_{jt}(AIME_{jt}, AIME_{-jt}, age_{jt})$), but for notational simplicity I exclude these functional arguments.

tion. A married couple's budget constraint is represented by the following equations:

$$x_t + s_{t+1} = Inc_{Mt}(1 - R_{Mt}) + Inc_{Ft}(1 - R_{Ft}) + ssb_{Mt}R_{Mt} + ssb_{Ft}R_{Ft} + (1 + r)s_t\ , \tag{5}$$

$$s_{t+1} \geq 0. \tag{6}$$

The couple can transform expenditure x_t into individual consumption c_{jt} for each spouse based on the following consumption production function:

$$x_t = (c_{Mt}^{\rho} + c_{Ft}^{\rho})^{1/\rho}. \tag{7}$$

If $\rho > 1$ then the combined consumption of the couple is greater than their expenditure (i.e. $c_{Mt} + c_{Ft} > x_t$). This consumption production function captures that spouses can share some consumption jointly such as a house and appliances. There are also lower prices for buying some goods in larger quantities such as food.[14]

Individuals use their available cash on hand that depends on their own retirement decision R_{jt}, labor income Inc_{jt}, Social Security benefit ssb_{jt}, and previous savings s_{jt} to finance their consumption c_{jt} and future savings s_{jt+1}. The budget constraint for a single individual is given by:

$$c_{jt} + s_{jt+1} = Inc_{jt}(1 - R_{jt}) + ssb_{jt}R_{jt} + (1 + r)s_{jt}; \tag{8}$$

$$s_{jt} \geq 0. \tag{9}$$

After a divorce the spouses lose the ability to share any consumption, and their consumption is equal to what they spend. In previous literature this shared consumption value for married couples are calibrated to the McClements Equivalence Scale (Voena [2015] and Foerster [2024]). De Nardi et al. [2025] also structurally estimate the consumption sharing for couples that is of similar magnitude to the McClements Equivalence Scale. According to this

[14] Voena [2015] and subsequent papers refer to this consumption production function as "economies of scale in consumption". This terminology is not ideal because this production function has constant returns to scale. I refer to this consumption production function as "shared consumption in marriage".

scale, a single individual spends 61% of what of a married couple spends for an equivalent consumption level.

4.5 Problem of Single Individual

An individual j who enters period t as single knows their previous savings s_{jt}, previous accumulated average indexed monthly earnings $AIME_{jt-1}$, and previous retirement status R_{jt-1}. Upon entering the period, the individual also observes the random component of the labor income Z_{jt} and a random utility shock for retirement status $\eta_{jt}(R_{jt})$ that follows a type I extreme value distribution.[15] The state space for individual j at time t is:

$$\omega_{jt}^{S} = \{s_{jt}, AIME_{jt-1}, R_{jt-1}, Z_{jt}, \eta_{jt}\}. \tag{10}$$

Given the state space, the individual makes decisions about retirement status R_{jt}, consumption c_{jt}, and savings s_{jt+1} to maximize the discounted sum of their life-time utility. Define q_{jt}^{S} to be the decisions of the individual, so $q_{jt}^{S} = \{c_{jt}, R_{jt}, s_{jt+1}\}$.

After making decisions, the individual has a probability π of being married in the next period to a new spouse. Several aspects of the new spouse's state space are a deterministic function of the single individual's state space. The savings s_{-jt+1}, average indexed monthly earnings $AIME_{-jt}$, and random component of labor income Z_{-jt} of the new spouse are determined by a fixed ratio to the individual's values of these variables. The savings of the two newly-weds is combined as joint savings (i.e. $s_{t+1} = s_{Mt+1} + s_{Ft+1}$), and no distinction exists between savings for the male and female in marriage. The final component of the new spouse's state space, the previous retirement status of the new spouse, is randomly chosen with probabilities that are a function of an individual's age and sex j.

Let the value of being single for individual j at time t with state space ω_{jt}^{S} be denoted

[15] Individual's continue to receive new preference shocks for retirement after they retire even though they face no retirement decisions. These shocks do not influence any decisions because retirement is an absorbing state, but they do impact the continuation value of being retired or not.

by $V^S_{jt}(\omega^S_{jt})$ and defined as:

$$\begin{aligned} V^S_{jt}(\omega^S_{jt}) = \max_{c_{jt},\, R_{jt},\, s_{jt+1}} \quad & u_j(c_{jt}, R_{jt}, 0) + \eta_{jt}(R_{jt}) + \beta\{(1-\pi)\mathbb{E}\left[V^S_{jt+1}\left(\omega^S_{jt+1}\right)\middle|\omega^S_{jt}, q^S_{jt}\right] \\ & + \pi\mathbb{E}\left[V^C_{jt+1}\left(\omega^C_{t+1}\right)\middle|\omega^S_{jt}, q^S_{jt}\right]\}, \end{aligned} \tag{11}$$

subject to:

(1) Budget constraint:

$$c_{jt} + s_{jt+1} = Inc_{jt}(1 - R_{jt}) + ssb_{jt}R_{jt} + (1+r)s_{jt}. \tag{12}$$

$$s_{j,t+1} \geq 0. \tag{13}$$

(2) Retirement is an absorbing state, so $R_{jt-1} = 1$ implies $R_{jt} = 1$.

Under the assumption that $\eta_{jt}(R_{jt})$ follows the type I extreme value distribution, the integral with respect to this variable in $\mathbb{E}V^S_t$ has a closed form solution (Rust [1987]). If the individual has not yet retired, then the optimal decision of q^S_{jt} can be found in two steps. First, fix the retirement decision R_{jt} and define the value of choosing the optimal savings as the solution to the following problem subject to the budget constraint:

$$\begin{aligned} \tilde{V}^S_{jt}(R_{jt}, \omega^S_{jt}) = \max_{c_{jt},\, s_{jt+1}} \quad & u_j(c_{jt}, R_{jt}, 0) + \beta\{(1-\pi)\mathbb{E}\left[V^S_{jt+1}\left(\omega^S_{jt+1}\right)\middle|\omega^S_{jt}, q^S_{jt}\right] \\ & + \pi\mathbb{E}\left[V^C_{jt+1}\left(\omega^C_{t+1}\right)\middle|\omega^S_{jt}, q^S_{jt}\right]\} \end{aligned} \tag{14}$$

Then, the optimal choice of retirement status is the solution the to problem:

$$\max_{R_{jt}} \quad \tilde{V}^S_{jt}(R_{jt}, \omega^S_{jt}) + \eta_{jt}(R_{jt}). \tag{15}$$

With the assumption that $\eta_{jt}(R_{jt})$ follows a type I extreme value distribution, the probability that individual j with state space ω_{jt}^S chooses to retire is given by:

$$\mathbb{P}(R_{jt} = 1|\omega_{jt}^S) = \frac{\exp(\tilde{V}_{jt}^S(1, \omega_{jt}^S))}{\exp(\tilde{V}_{jt}^S(0, \omega_{jt}^S)) + \exp(\tilde{V}_{jt}^S(1, \omega_{jt}^S))}. \tag{16}$$

If the individual was not previously retired and decides not to retire this period (i.e. $R_{jt} = 0$), they also report a "planned retirement age" PR_{jt}^S, which is the expected retirement age for the individual given the state space and decisions of the individual in the current period. Let T_j denote the realized retirement age for individual j. Then the planned retirement age for single individual j at time t denoted by PR_{jt} can be written as:

$$PR_{jt}^S = \mathbb{E}\left[T_j \mid \omega_{jt}^S, q_{jt}^S\right] \tag{17}$$

4.6 Problem of the Married Couple

I model couples as a cooperative unit who maximize the weighted sum of the male and female's utility. In this weighted sum, males are given a Pareto weight $\theta \in [0, 1]$, and females are given the weight $1-\theta$. In the model for a couple, all savings are considered joint property of the couple, and no distinction is made between savings by either spouse.

A couple that enters period t as married knows their previous savings s_t, previous accumulated average indexed monthly earnings $AIME_{jt-1}$, and previous retirement statuses R_{jt-1}. Upon entering the period, the couple also observes the random component of their labor income Z_{jt} governed by the process defined in section 5.3 and a random utility shock for retirement statuses $\eta_t(R_{Mt}, R_{Ft})$ that follows a type I extreme value distribution. The state space for the married couple is:

$$\omega_t^C = \{s_t, AIME_{Mt-1}, AIME_{Ft-1}, R_{Mt-1}, R_{Ft-1}, Z_{Mt}, Z_{Ft}, \eta_t(R_{Mt}, R_{Ft})\}. \tag{18}$$

Given this state space, the couple makes decisions about current retirement statuses R_{jt}, consumption c_{jt}, and savings s_{t+1} by acting cooperatively to maximize the discounted sum of their life-time utility with the male receiving Pareto weight θ. Define the decisions of the couple as: $q_t^C = \{c_{Mt}, c_{Ft}, s_{t+1}, R_{Mt}, R_{Ft}\}$.

After making decisions and before going to the next period, the couple has a probability p of divorcing. When divorce occurs, the couple splits savings evenly and pays a financial cost L. If the financial cost is greater than the individual's share of the savings, their savings going into the next period are zero. Divorce is entirely random. It may be possible that one spouse would prefer divorce to staying as a couple, but this is not allowed in the model.

Let the joint value of the married couple at time t with state space ω_t^C be denoted by $V_t^C(\omega_t^C)$ and defined as:

$$\begin{aligned} V_t^C(\omega_t^C) = \max_{c_{Mt},\, c_{Ft},\, s_{t+1},\, R_{Mt},\, R_{Ft}} \; & \theta u_M(c_{Mt}, R_{Mt}, 1) + (1-\theta) u_F(c_{Ft}, R_{Ft}, 1) + \eta_t(R_{Mt}, R_{Ft}) \\ & + \beta\{(1-p)\mathbb{E}\left[V_{t+1}^C\left(\omega_{t+1}^C\right)\middle|\omega_t^C, q_t^C\right] \\ & + p\mathbb{E}\left[V_{t+1}^S\left(\omega_{t+1}^S\right)\middle|\omega_t^C, q_t^C\right]\}, \end{aligned} \tag{19}$$

subject to:

(1) Budget constraint:

$$x_t + s_{t+1} = Inc_{Mt}(1-R_{Mt}) + Inc_{Ft}(1-R_{Ft}) + ssb_{Mt}R_{Mt} + ssb_{Ft}R_{Ft} + (1+r)s_t. \tag{20}$$

$$x_t = (c_{Mt}^\rho + c_{Ft}^\rho)^{1/\rho}. \tag{21}$$

$$s_{t+1} \geq 0. \tag{22}$$

(2) Retirement is an absorbing state, so $R_{jt-1} = 1$ implies $R_{jt} = 1$.

Because the Pareto weight (θ) for male and female is fixed, the model predicts that male and females consumption will be a fixed ratio to each other. From the first order conditions, we can derive that:

$$\frac{c_H}{c_W} = \left(\frac{\theta}{1-\theta}\right)^{\frac{1}{\gamma+\rho-1}} \tag{23}$$

The term V^S_{t+1} denotes the joint value to the couple of divorcing in the next period and is defined as $V^S_{t+1}(\omega^S_{t+1}) = \theta V^S_{M,t+1}(\omega^S_{Mt+1}) + (1-\theta)V^S_{F,t+1}(\omega^S_{Ft+1})$. With the assumption that $\eta_t(R_{Mt}, R_{Ft})$ follows a type I extreme value distribution, the couple's choice of retirement statuses if at least one of the spouses has not yet retired follows similar steps as those of the single individuals.

The value in equation (19) is the joint value for the couple. I now define the value of marriage to each individual. The couple acts cooperatively to maximize the weighted sum of their utility, which leads to optimal choices $q^*_t = \{c^*_{Mt}, c^*_{Ft}, s^*_{t+1}, R^*_{Mt}, R^*_{Ft}\}$ from the maximization problem in equation (19). The value to spouse j of being married at time t with state space ω^C_t denoted by $V_{jt}(\omega^C_t)$ is then defined as:

$$\begin{aligned} V^C_{jt}(\omega^C_t) &= u_j(c^*_{jt}, R^*_{jt}, 1) + \eta_t(R_{Mt}, R_{Ft}) \\ &\qquad + \beta\{(1-p)\mathbb{E}\left[V^C_{jt+1}\left(\omega^C_{t+1}\right)\middle|\omega^C_t, q^*_t\right] + p\mathbb{E}\left[V^S_{jt+1}\left(\omega^S_{jt+1}\right)\middle|\omega^C_t, q^*_t\right]\}. \end{aligned} \tag{24}$$

Note that this is not a maximization problem. The optimal decisions are decided by the maximization problem in equation (19). Instead, it is the value to spouse j of these decisions. This is the term that appears in the continuation value for singles who potentially remarry in the following period.

Previous work on discrete choice has shown that under the assumption that $\eta_t(R_{Mt}, R_{Ft})$ follows type I extreme value distribution, there is a closed form solution to the expectation in the maximization problem of equation (19) with respect to η_t (Rust [1987]). In the appendix, I also show that there is a closed form solution to the expected value for each spouse in equation (23) with respect to η_t: $\mathbb{E}\left[V^C_{jt}\left(\omega^C_t\right)\middle|\omega^C_{t-1}, q^C_{t-1}\right]$.

If one of the spouses was not previously retired and decides not to retire this period (i.e. $R_{jt} = 0$), they also report a "planned retirement age" PR^C_{jt}, which is the expected retirement age for the individual given the state space and decisions of the couple in the current period. Let T_j denote the realized retirement age for individual j. Then the planned retirement age for married individual j at time t denoted by PR^C_{jt} can be written as:

$$PR^C_{jt} = \mathbb{E}\left[T_j \mid \omega^C_t, q^C_t\right] \tag{25}$$

4.7 Model Solution

I solve the model recursively from the terminal period of age 83 for men and 81 for women. In this period, the continuation value at all states is equal to zero. If an individual does not retire in the terminal period, then their expected retirement age is the terminal age. From these terminal conditions, I solve for value functions and planned retirement ages in each preceding period.

To solve the model numerically, I discretize the continuous state variables of $AIME_{jt}$, Z_{jt}, and s_t on a grid and use linear interpolation for values between the grid points. To approximate the expectation of the continuation value with respect to the random component of labor income, I integrate using Gauss-Hermite quadrature (Judd [1998]).

5 Estimation

I estimate the model following a two-step estimation strategy. From the previous literature, I take parameters that I cannot identify in the PSID data. From the data and outside the model, I calculate parameters such as marriage and divorce probabilities that can be cleanly identified. Finally, inside the model using the simulated method of moments, I estimate the utility parameters for the value of leisure to match targeted moments. Because the goal of this paper is to explain how marriage and divorce influence retirement decisions, I target the changing patterns of planned retirement ages and expenditure around the time of marital status changes (i.e. Figures 6, 7, 14, and 15).

Table 6: Parameters from External Sources

Parameter	Value	Source
Discount Factor (β)	0.96	
Interest rate (r) s	0.05	
Coefficient of Relative Risk-Aversion (γ)	1.5	
Social Security Rules		Casanova [2011]
Consumption Sharing Parameter (ρ)	1.41	McClements Equivalence Scale
Pareto Weight (θ)	0.7	Knowles [2013] & Voena [2015]
Financial Cost of Divorce (L)	$10,000	Rosen Law Firm

Note: This table lists parameters set from the previous literature and their sources.

5.1 External Parameters

Several parameters are set from the previous literature as listed in Table 6. I set the two-period discount factor (β) to be 0.96, which corresponds to a yearly discount factor of 0.98. The two-year risk-free interest rate is set to 5%, which corresponds to a yearly interest rate of 2.5%. The relative risk aversion (γ) is set to 1.5.[16] I follow the Social Security rules from Casanova (2010) to map average indexed earnings to benefits as described in the appendix. The consumption sharing parameter (ρ) is calibrated to the McClements Equivalence Scale as described in Voena [2015]. I set the Pareto weight (θ) for the male in marriage to be equal to 0.7, which is in line with estimates from previous papers (Voena [2015] and Knowles [2013]). From this parameterization of γ, ρ, and θ, the male-to-female consumption ratio in equation (23) will be equal to 1.561. The financial cost of divorce is set to $\$10,000$ based on estimates from the Rosen Law Firm fee calculator.

Additionally, I estimate several parameters in the data that can be cleanly identified

[16] Most estimates in the literature are between 1 and 2. Fernández and Wong [2017] and Voena [2015] in similar models of divorce use a value of 1.5.

outside the model. These include the income process and marriage market with parameters listed in Table 7.

For the income process, I set the age profile G_j to be a degree two polynomial and estimate the following regression by ordinary least squares separately by gender j:

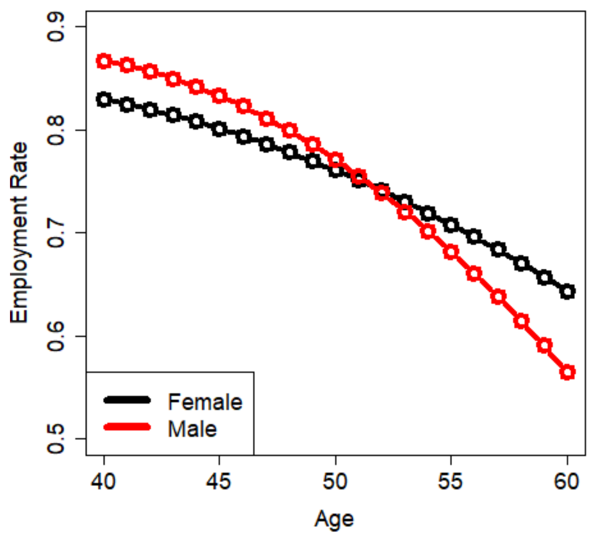
$$\log(Inc_{it}) = \lambda_{1j} age_{it} + \lambda_{2j} age_{it}^2 + f_i + \varepsilon_{it}. \tag{26}$$

The variance of the random shock to income σ_j^2 is set to be equal to $\text{var}_j(\varepsilon_{it} - \varepsilon_{it-1})$.

The transition probability from marriage to single for those between the age of 40 to 60 is estimated in the PSID to be 2.62%, and the probability of transitioning from single to married is estimated to be 6.18%. I assume in the model that no divorces and marriages happen after the age of 59 for females and 61 for males. In the data, the divorce and marriage rates after the age of 60 are four times lower than between the ages of 40 and 60.

For the marriage market, which determines the type of individual a single individual will marry, I follow the strategy of Fernández and Wong [2017] by comparing the median values of singles of each gender for ages 40 to 60. The ratios of male-to-female $AIME$, savings, and random component of income Z are listed in Table 9. For example based on these values, a single woman with $AIME$ equal to $\$1,000$, savings $\$10,000$ and random component of labor income Z_{Ft} equal to 1 will marry a man with $AIME$ equal to $\$1,449$, savings $\$15,020$, and random component of labor income Z_{Mt} equal to 1.241. These ratios are larger than those estimated by Fernández and Wong [2017], who estimate a male-to-female savings ratio of 1.125. Their data set and model contain all individuals over the age of 20, and my larger estimates suggests that the financial resource gap between men and women grows over time. For the probability that a new spouse is not retired, I take the fraction of single individuals for each gender that are employed at the relevant age as shown in Figure 17.

Figure 18: Employment Rate for Single Individuals by Age in PSID



Note: This figure shows the employment rate of single individuals in the PSID by gender across ages. These values are used as the probability that a single individual in the model will marry an individual who is not retired.

Table 7: Parameters Estimated Outside of Model

	Parameter	Value	Source
Income Process:			
	λ_{1H}	0.112	PSID
	λ_{2H}	-0.00118	PSID
	σ^2_H	0.341	PSID
	λ_{1W}	0.161	PSID
	λ_{2W}	-0.00156	PSID
	σ^2_W	0.262	PSID
Transition Probabilities:			
	Marriage Rate	6.18%	PSID
	Divorce Rate	2.62%	PSID
Marriage Market:			
	Male-to-Female $AIME$ Ratio	1.449	PSID
	Male-to-Female Savings Ratio	1.502	PSID
	Male-to-Female Z Ratio	1.241	PSID
	Retired Probability	Figure 17	PSID

Note: This table lists parameters that were estimated from the PSID outside the simulated method of moments.

5.2 Simulated Method of Moments

To estimate the utility parameters for the value of retirement $\chi = (\psi_M, \psi_F, \kappa_M, \kappa_F)$, I use the simulated method of moments. I target the profile of planned retirement ages and expenditure around the time of marriage and divorce as shown in Figures 6, 7, 14, and 15; define these targeted data moments to be M. In the simulated data, increasing ψ_j will decrease planned retirement ages for all type j individuals, while increasing κ_j will decrease the planned retirement ages more so for married individuals of type j. Thus, the parameters ψ_j are then identified by the levels of the planned retirement age profiles, while the parameters κ_j are identified by the changes in these profiles after marriage and divorce.

In the PSID, I estimate an initial distribution of households around the age of 40.[17] From this initial distribution and given a parameter guess χ, I simulate 1,000 life-cycles and

[17]Most previous papers including Voena [2015], Fernández and Wong [2014], and Foerster [2024] start their models around the age of 20 with zero savings and a common income levels. This won't work for my scenario because my model doesn't start until age 40, at which point individuals must already have some distribution of savings, marriage status, and labor income.

calculate an analogous set of moments to characterize the profile of planned retirement ages and expenditure in the model (i.e. I run the regression from equation 1 on the simulated data). Define $\hat{M}(\chi)$ to be the simulated moments from the model.

The objective function is the sum of the squared differences between the simulated moments and the data moments:

$$(M - \hat{M}(\chi))'(M - \hat{M}(\chi)). \tag{27}$$

I minimize this objective function using a basin-hopping algorithm to ensure I do not reach a local minimum. Starting from an initial guess χ_0, I use the Nelder-Mead algorithm to find a candidate solution χ_1. I then randomly perturb this solution and re-run the Nelder-Mead algorithm. After repeating this process six times, I choose the solution that returns the smallest value to the objective function.[18]

6 Results

Table 8 presents the estimated parameters from the simulated method of moments. The value of male retirement for single individuals ($\psi_M = 0.417$) is roughly 25% larger than the value of female retirement for single individuals ($\psi_F = 0.334$). Of particularly interest is the change in retirement value in the marriage for each type (κ_j). The change in female retirement value in marriage ($\kappa_F = 0.025$) is about 8% of the retirement value when not married. This suggests that the financial considerations of the model presented in section 5 can explain a majority of the change in planned retirement ages for women. In contrast, the change in male retirement value in marriage ($\kappa_M = -0.870$) is negative and quite large. In magnitude, it is twice as large as the marginal value of male retirement when single. This shows that the financial considerations in the model do not explain how men's planned retirement ages change in response to marital status changes. Without changing male retirement value in

[18]This is the process used by Foerster [2024]

Table 8: Parameter Estimates

	(1) Male Retirement Value when Single ψ_M	(2) Female Retirement Value When Single ψ_F	(3) Change in Male Retirement Value in Marriage κ_M	(4) Change in Female Retirement Value in Marriage κ_F
Estimate	0.417	0.334	-0.870	0.025

Note: This table lists the parameter estimates from the simulated method of moments estimation.

the marriage (i.e. setting $\kappa_M = 0$), then men would behave similarly to women by having a large decrease in their retirement plans after marriage and an increase in planned retirement ages after divorce.

Figures 19 to 20 show the model fit to the targeted planned retirement age moments. The model is able to replicate the general patterns in planned retirement ages following marital status changes. Women's planned retirement ages decrease after marriage and increase after divorce in the estimated model. Men's planned retirement ages increases after marriage in the model as it does in the data. The model generates a large decline in men's planned retirement ages after divorce, while the data suggests this decline should be smaller or non-existent.

Table 9 shows how the coefficients on the control variables in the simulated data compare to the corresponding coefficients estimated in the data. Neither labor income nor the income ratio of the spouse to the individual have large effects on the planned retirement age of men and women. These variables similarly did not have large effects on planned retirement ages in the PSID. In the simulated data, a 1% increase in labor income increases planned retirement ages by 0.0002 years for men and decreases planned retirement ages by 0.0013 years for women.

Figures 21 and 22 show the model fit to the targeted moments of the log of expenditure per person in the household around the time of marital status changes. The model does

Figure 19: The Effect of Marriage on Planned Retirement Ages in the Data and Model

Men (Left) and Women (Right)

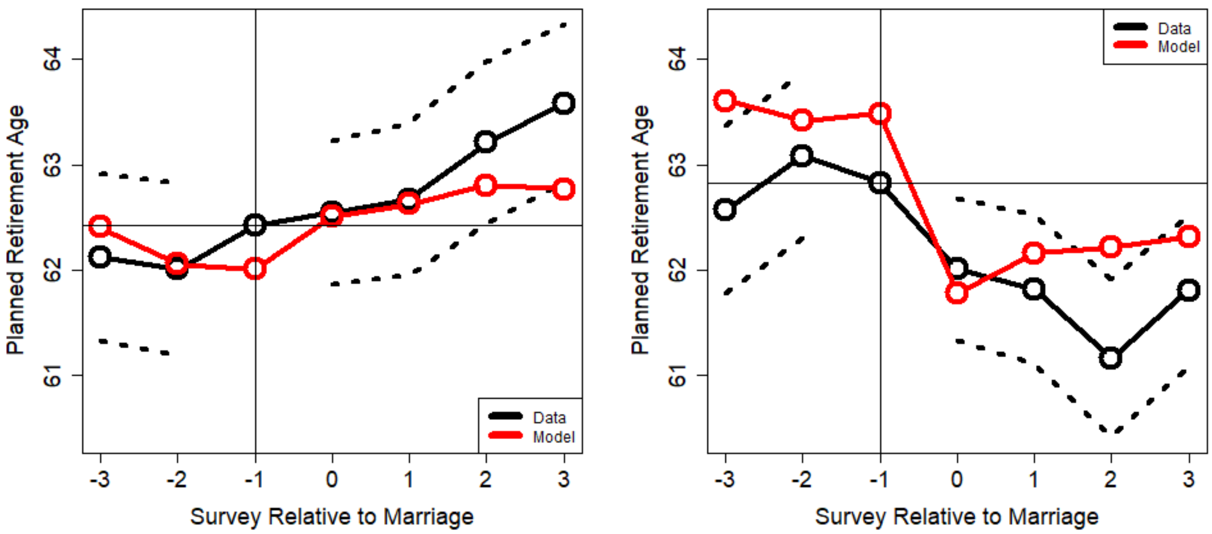
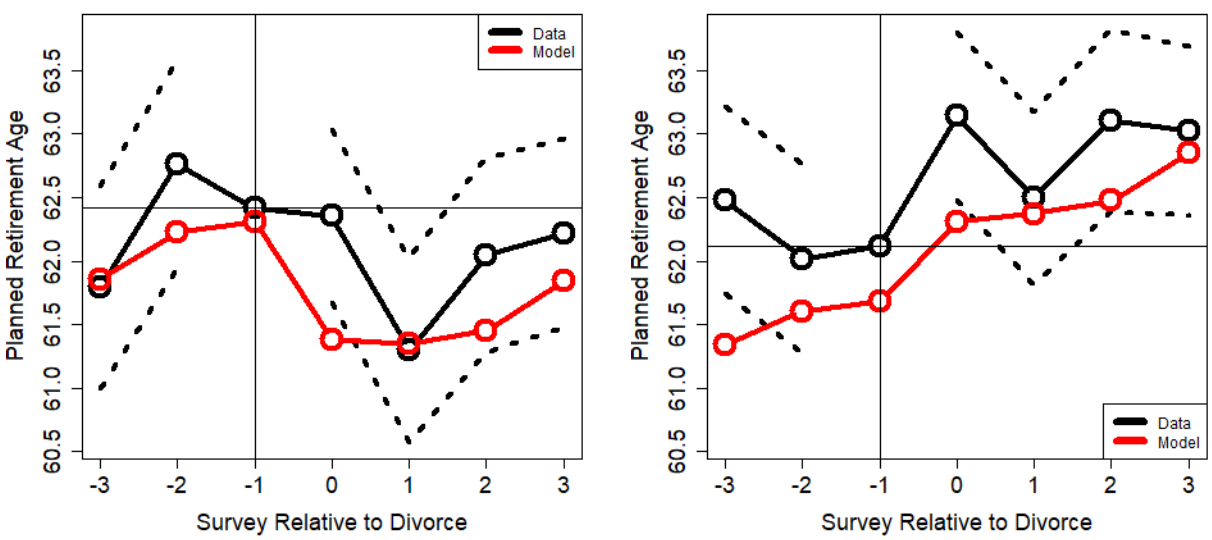


Figure 20: The Effect of Divorce on Planned Retirement Age in the Data and Model

Men (Left) and Women (Right)



Note: Figures 18 and 19 present the estimated coefficients α_τ and β_τ from equation 1 when the outcome variable is the planned retirement age from PSID data and model simulations. Standard errors in parentheses are clustered by individual. The dotted lines represent the 90% confidence intervals.

Table 9: Relationship between Planned Retirement Ages and Control Variables in Data and Simulations

	Dependent variable:			
	Planned Retirement Age			
	(1)	(2)	(3)	(4)
Log(My Labor Inc)	-0.762	-0.543	0.023	-0.130
	(0.115)	(0.098)	(0.010)	(0.009)
Spousal Income Ratio	-0.683	0.175	0.0004**	0.0002
	(0.607)	(0.460)	(0.0002)	(0.001)
Unemployed	-0.068	-0.031	—	—
	(0.397)	(0.353)		
Spouse Unemployed	-0.033	-0.402	—	—
	(0.307)	(0.342)		
My Work Limit	-0.272	-0.028	—	—
	(0.188)	(0.172)		
Sp. Work Limit	-0.159	-0.105	—	—
	(0.166)	(0.176)		
Gender	Men	Women	Men	Women
Sample	PSID	PSID	Simulation	Simulation
Individual FE	Yes	Yes	Yes	Yes
Age FE	Yes	Yes	Yes	Yes
Observations	9,956	10,532	45,032	79,035
R^2	0.700	0.683	0.905	0.905

Note: This table present the estimated coefficients on the control variables X_{it} from equation 1 when the outcome variable is the planned retirement ages from both the PSID data model simulations. Standard errors in parentheses are clustered by individual.

not match the general trends of these moments. After marriage in the data, both men and women exhibit large declines in the household expenditure per person. In contrast, in the model men's expenditure only declines slightly while women's expenditure exhibits a large increase. A similar issue exists for the change in expenditure after divorce; the model predicts that men and women should have large declines in expenditure after divorce, but the data shows that both men and women increase expenditure after divorce. Although the directions of changes do not match, the model does match the overall patterns that woman gain more than men financially from marriage and lose more from divorce.

The model may fail to match the change in expenditure after marital status changes for several reasons. First, I model retirement as an absorbing state. This may explain why consumption falls for both men and women after divorce in the simulation. Individuals who retire in marriage and then get divorced cannot increase their income by returning to work. This forces them to finance all consumption out of savings until they are eligible for Social Security. This will lead to large declines for these individuals and on average large declines after divorce. Second, the model may fail to match expenditure patterns after marriage because the consumption production function is mischaracterized for this sample. The McClements Equivalence Scale may not capture consumption sharing for these older PSID households, so the value of ρ should be adjusted. A different parametric form may also be needed, such as having a distinct third consumption good that can be jointly shared by household members. Finally, there is selection into both marriage and divorce that I do not capture by modelling marital status changes as entirely random. Marriages may form between spouses who have the most to gain from consumption sharing, and divorce may occur only in couples where there is little gain from consumption sharing. This selection will not be captured here and may explain part of the different expenditure patterns predicted by the model compared to the data.

Figure 21: The Effect of Marriage on the Log. of Exp. per Person in the Data and Model

Men (Left) and Women (Right)

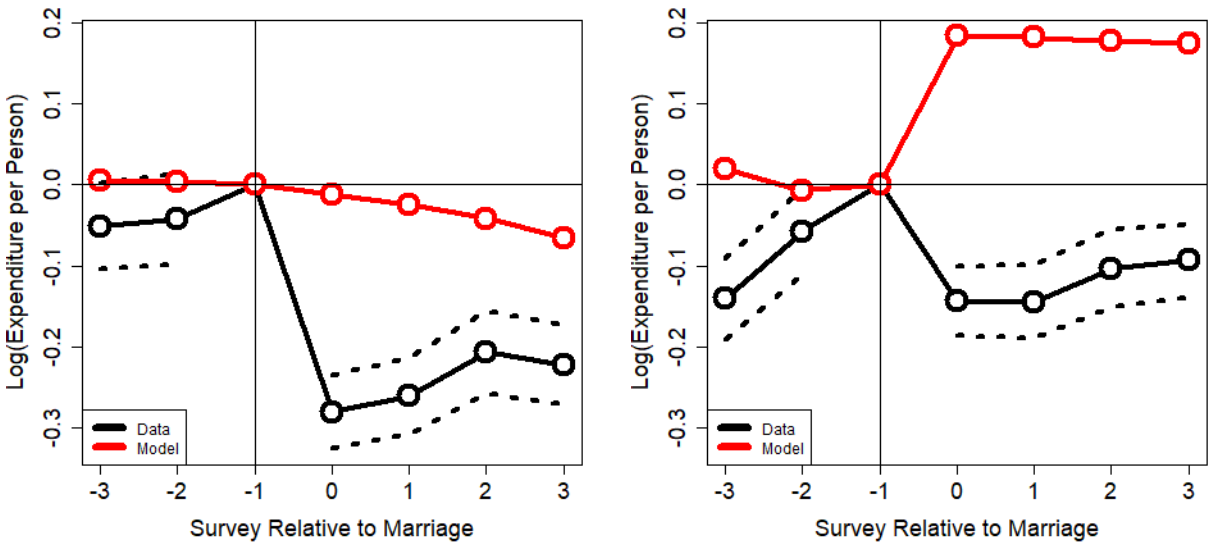
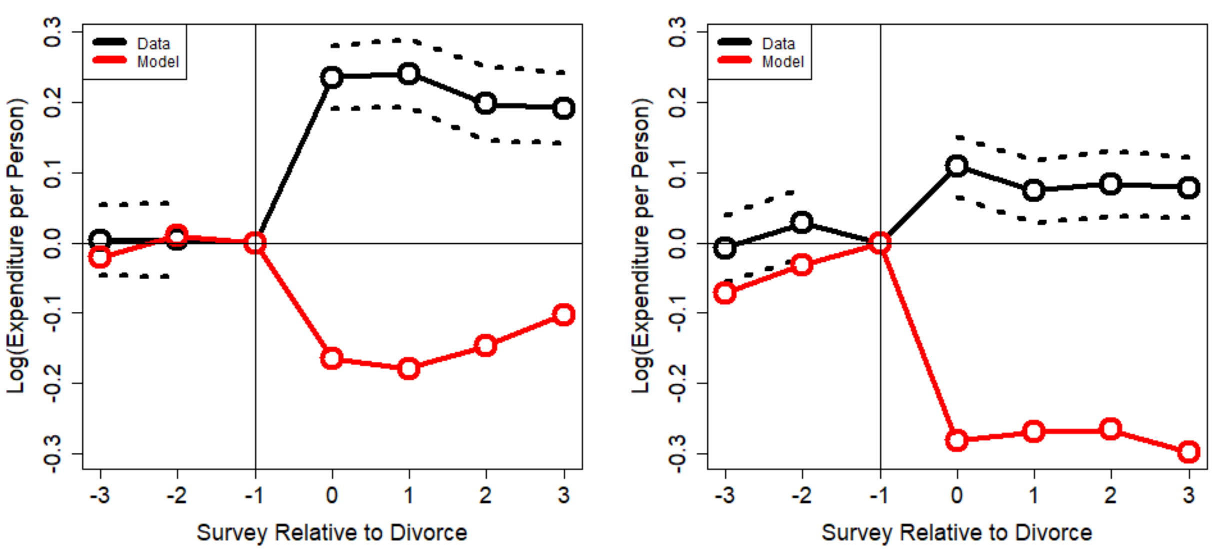


Figure 22: The Effect of Divorce on the Log. of Exp. per Person in the Data and Model

Men (Left) and Women (Right)



Note: Figures 21 and 22 present the estimated coefficients α_τ and β_τ from equation 1 when the outcome variable is the log of expenditure per person from PSID data and model simulations. Standard errors in parentheses are clustered by individual. The dotted lines represent the 90% confidence intervals.

7 Conclusion

This paper has studied how divorce and marriage impact retirement decisions using self-reported planned retirement ages. Men's and women's retirement decisions respond differentially to marital status changes. Women increase their planned retirement age by one year after divorce and similarly decrease it by one year after marriage. Men's planned retirement ages increase after marriage by one year but are relatively stable after divorce. Men's planned retirement ages are biased upwards after divorce, though, because men stop working and participating in pension plans immediately after divorce and do not report updated planned retirement ages.

To explore mechanisms for why marital status changes impact retirement decisions, I also study how other household decisions change after divorce and marriage. Household expenditure per person increases for men and women after divorce and decreases after marriage; this suggests that shared consumption is an important benefit of marriage that is lost from divorce. Men's household expenditure per person also increases by more than women after divorce and similarly decreases by more after marriage; these larger shifts after marital status changes for men suggest that women gain more financially from marriage and lose more from divorce. In addition to expenditure, I also analyze how housework time changes after divorce. Combined housework of men and women increases after marriage and decreases after divorce, suggesting that home production is a common good with higher marginal value in marriage compared to divorce.

To better understand why retirement responds to marital status change, I also construct and estimate a life-cycle model of divorce, marriage, and retirement decisions. The model has several financial benefits of marriage including a joint budget constraint, shared consumption in marriage, and a spousal Social Security benefit. The model also allows for the marginal value of retirement to vary based on marital status. Estimation of the model reveals that the financial benefits of marriage can explain how women's planned retirement ages respond to marital status changes. In order to match the observed patterns in planned retirement ages for men after marriage and divorce, the model estimation generates a large negative value of retirement for men in marriage; this suggests that the financial considerations in the model do not capture how men's planned retirement ages adjust after marital status changes.

The model also fails to match observed patterns in household expenditure per persons after marriage and divorce. This mismatch can be the result of several modelling choices: (i) retirement is an absorbing state, and there are no intensive labor supply decisions; (ii) consumption sharing in marriage may be incorrectly parameterized; (iii) marital status changes are modeled as exogenous shocks rather than household decisions with selection. Incorporating some or all of these three features would help better match observed expenditure patterns and possibly men's planned retirement ages. A model that can better explain both the patterns in men's planned retirement ages and expenditure patterns would be a useful direction for future research.

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A. Appendix

A.1. Social Security Rules

The Social Security Benefit is a function of the highest 35 years of earnings for each worker with these 35 years of earnings being used to calculate the average indexed monthly earnings ($AIME_{jt}$). An individual's $AIME_{jt}$ is mapped to a Social Security benefit (ssb_{jt}) based on the formula from Casanova [2011]:

$$\begin{aligned} ssb_{jt} = 0.90 \min\{AIME_{jt}, 387\} &+ 0.32 \min\{\max\{AIME_{jt} - 387, 0\}, 1,946\} \\ &+ 0.15 \max\{AIME_{jt} - 2,333, 0\}. \end{aligned} \tag{28}$$

Individuals begin in the model with some initial $AIME_{jt}$. If this individual was observed in the PSID for at least six surveys before age 40, this is based on their observed earnings history. If the individual was observed for less than six surveys before age 40, their initial $AIME_{jt}$ is imputed based on observed demographic characteristics. I used the strategy of updating $AIME_{jt}$ from French [2005]. Before the age of 60 if an individual with $AIME_{jt-1}$ works with income Inc_{jt}, then $AIME_{jt}$ is calculated as:

$$AIME_{jt} = AIME_{jt-1} + \frac{1}{35} Inc_{jt}. \tag{29}$$

If the individual is over the age of 60, $AIME_{jt}$ is calculated by:

$$AIME_{jt} = AIME_{jt-1} + \frac{1}{35} \max(Inc_{jt} - AIME_{jt-1}, 0). \tag{30}$$

A.2. Expected Value of Marriage for Individual Spouses[19]

Suppose there N alternative options and two individuals $i \in 1, 2$. The pay-off of individual i for alternative n has two components. The deterministic pay-off for individual i is given by $x_{i,n}$ and varies across the two individuals. The random component η_n follows type I extreme value distribution and is shared by individuals. The total pay-off to individual i is given by $\tilde{x}_{i,n} = x_{i,n} + \eta_n$. Assume that the two individuals act cooperatively and maximize the weighted sum of their pay-off. Suppose individual i receives weight θ in this set-up. The deterministic pay-off to the pair is $v_n = \theta x_{1,n} + (1-\theta) x_{2,n}$, and the total pay-off to the pair is $\tilde{v}_n = v_n + \eta_n$. Let the indicator d_n be equal to one if the pair chooses alternative n and equal to zero otherwise.

Because η_n follows the type I extreme value distribution, we have the following four statements. Here, γ is the Euler constant.

[19]Proofs of statement's 1 to 3 can be found on John Kennan's website: Average Switching Costs in Dynamic Logit Models (https://www.ssc.wisc.edu/∼jkennan/research/LogitSwitchingCosts.pdf).

Statement 1:

$$P(d_n = 1) = \frac{\exp(v_n)}{\sum_j \exp(v_j)}. \tag{31}$$

Statement 2:

$$E \max_n \tilde{v}_n = \gamma + \log \sum_n \exp(v_n). \tag{32}$$

Statement 3:

$$E\left[v_n + \eta_n | d_n = 1\right] = \gamma + \log \sum_n \exp(v_n). \tag{33}$$

Statement 4:

$$E\left[\sum_n \tilde{x}_{1,n} d_n\right] = \gamma + \log \sum_n \exp(v_n) + (1-\theta) \sum_n (x_{1,n} - x_{2,n}) P(d_n = 1) \tag{34}$$

Proof of Statement 4:

$$\begin{aligned}
& E\left[\sum_n \tilde{x}_{1,n} d_n\right] \\
& = \sum_n E\left[\tilde{x}_{1,n} | d_n = 1\right] P(d_n = 1) \\
& = \sum_n E\left[\tilde{v}_n + (1-\theta)(x_{1,n} - x_{2,n}) | d_n = 1\right] P(d_n = 1) \\
& = \sum_n \left(E\left[\tilde{v}_n | d_n = 1\right] + (1-\theta)(x_{1,n} - x_{2,n})\right) P(d_n = 1) \\
& = \gamma + \log \sum_n \exp(v_n) + (1-\theta) \sum_n (x_{1,n} - x_{2,n}) P(d_n = 1)
\end{aligned} \tag{35}$$