Impact of Divorce on Retirement Security

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RAND Labor & Population

Abstract

In this paper, we consider the implications of divorce on retirement security. We introduce a theory that highlights how specialization within a divorcing household and timing of divorce relative to planned timing of retirement savings can have a negative impact on retirement security. Using panel data from the Health and Retirement Study (HRS), we evaluate differences in accumulated total and liquid retirement wealth at retirement ages. We replicate past findings that find a negative relationship between ever-divorced individuals and asset accumulation, particularly for women. We find that the negative relationship in our sample between wealth and divorce without remarriage is worse for women who divorce in their 30s than for women who divorce in their 50s whereas for men the relationship is worse for men who divorce in their 50s compared to men who divorce in their 30s.

Using the household nature of our data, we compare assets of households before a separation leading to a divorce to those of each individual after that separation. We find evidence of swapping and liquidation of retirement and housing assets: 51 percent of separating households with liquid pre-separation retirement assets will have at least one household member with zero liquid retirement assets after separation. Finally, we develop a methodology to evaluate whether near-retirement divorce impacts retirement decumulation. We conduct a differences-in-differences matching analysis that assigns individuals who eventually divorce within the HRS to similar, but non-divorcing, individuals at first interview. This analysis controls for observed differences between the average divorcee and the average continuously married person, as well as permanent unobserved differences. We find that separated women are more likely to delay Social Security retirement benefit claiming until age 65 or 66, but otherwise we find no significant evidence that divorce is associated with differential decumulation of liquid retirement assets.

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1. Introduction

Divorce is considered one of the most stressful transitions in a person's life (Booth and Amato, 1991). When a marriage ends, it can be an extremely difficult event, both emotionally and financially. There are immediate financial repercussions, such as the actual costs of the legal proceedings, but there are also financial consequences that result from dividing household assets. Also, divorce is becoming increasingly common at older ages (for example, see Wu and Schimmele (2007)). Even though the overall divorce rate in the United States remained relatively flat from 1990 to 2010, from 19.0 per thousand to 18.9 per thousand, the divorce rate among adults aged 50 and older doubled from 4.9 per thousand married persons in 1990 to 10.1 per thousand married persons in 2010 (Brown and Lin, 2012).

Retirement security is largely determined by wealth accumulation. This wealth accumulation can take the form of retirement accounts, housing wealth, investments, or other savings and assets. Because assets are split at divorce and because individual households lose the economies of scale that come with a shared household, wealth often declines after a divorce. Post-divorce, individuals can take different actions to mitigate financial hardships that result from divorce, such as returning to or continuing a career or remarriage. Individuals who divorce when they are young have a long horizon to work, save, and accumulate wealth for retirement. But individuals who divorce when they are approaching retirement age have a much shorter horizon to recover from the financial hardship divorce entails and may have saved jointly when married. Retirement insecurity among those who divorce near retirement age—marked by lower monthly pension levels (Social Security or private), cashing out or early withdrawal of retirement plans, or low savings—can arise after the division of assets because of limited short-term liquidity or limited annuitable income to protect against outliving one's assets. The growing trend of near-retirement divorce has important implications for retirement security and decumulation. Furthermore, retirement insecurity is often more problematic for women after divorce. Divorcing women in the Health and Retirement Study (HRS) lose, on average, $161,000 in non-housing assets, leaving them with an average of $199,000 in non-housing assets. Post-divorce, these women retain between 35 and 43 percent of the before-separation non-housing, household net assets (Knapp, 2014).

In this project, we study the impact of divorce, particularly late-in-life divorce, on retirement security.

In particular, our key research questions are:

1. How do older divorcees differ from those who divorced when young in terms of retirement wealth once they reach age 65 and later? How do factors such as remarriage or post-divorce employment impact retirement wealth?

2. How do households divorcing after 50 divide assets, particularly retirement assets, at separation?
3. Do individuals who divorce after 50 differ from continually married households in their retirement decumulation behavior, including Social Security claiming patterns?

To investigate our key research questions, we use data from the biennial HRS, a nationally representative sample of households with at least one household member over the age of 50. The rich set of longitudinal data available in the HRS will allow us to observe wealth trajectories while controlling for permanent and time-varying differences between households. The HRS's retrospective marital and work histories will allow us to contrast how retirement outcomes differ by age at divorce and, particularly, differences in outcomes by whether these individuals remarried and whether they were working before their divorce. The time period covered by the HRS represents a unique opportunity to follow the retirement wealth accumulation of households as they approach retirement. For the small, but growing number of households that divorce after 50, it can shed light on how this disruptive life event impacts retirement preparedness.

We begin by comparing both total wealth and retirement wealth at age 65 and above of HRS respondents who have been continuously married to those who have experienced at least one divorce. Our descriptive analysis shows that those who are continuously married have higher total wealth and retirement wealth at age 65 and older than those who have been divorced, even if they remarry. A larger percentage of continuously married individuals have positive retirement wealth than ever-divorced individuals, and a greater percentage of men have retirement assets compared to women, regardless of marital history.

Divorce timing also looks to have implications for long-term wealth: generally, those who divorce in their fifties have less wealth at age 65 than those who divorce in their thirties, but there are important differences by current marital status and labor force status. Remarriage reduces the negative effects of divorce, especially for early divorces.

Multivariate regression results confirm our descriptive analysis results. We find that ever having been divorced is associated with lower household assets and lower retirement assets when compared to those who have been continuously married.

Using households that separate after their first HRS interview and continue to be interviewed after separation, we evaluate how assets are divided.[1] We find evidence of significant swapping and liquidation of retirement and housing assets: 51 percent of households with pre-separation

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[1] Here and throughout this paper we will occasionally reference separations instead of divorce. These are separations leading to divorce, and the distinction is important in the circumstances where it is used. The HRS begins asking about finances separately once a couple has separated. Since legal divorces can occur some time after separation, we consider the division of assets when the HRS begins asking the individuals separately about their assets. The alternative – examining assets at divorce –leads to spuriously small changes in assets due to the change being calculated in some cases between an interview where an individual has separated and a follow up interview where the individual has legally divorced.

retirement wealth will have at least one household member with zero liquid retirement assets after separation.

Our final analysis considers the impact of divorce on retirement decumulation. This analysis controls for observed differences between the average divorcee and the average continuously married person, as well as permanent unobserved differences. We find no significant evidence that divorce is persistently associated with measures of liquid retirement assets decumulation after controlling for these differences. We find that separated women are more likely to delay Social Security retirement benefit claiming until age 65 or 66.

We summarize the research literature on the impact of divorce on retirement wealth in the next section. Section 3 discusses laws pertaining to the division of marital assets in a contested divorce. Section 4 presents a model of asset accumulation and the impact of a disruption such as divorce on asset accumulation. We describe the data we use for our analysis in Section 5 and present our results in Section 6. Section 7 summarizes our findings.

2. Previous literature

The impacts of divorce, both economic and other, have been well documented in the research literature (see, e.g., Kitson and Morgan, (1990)). Financially, women fare worse after divorce than men (Smock, Manning and Gupta, 1999; Lavelle and Smock, 2012), particularly when women have custody of children (Bartfield, 2000; Bianchi, Subaiya and Kahn, 1999). Divorced women, aged 65 and older, are more likely than divorced men, aged 65 and older to live in poverty (Government Accountability Office, 2014). In this section, we review previous literature that examines the impact of divorce on retirement wealth (or total wealth at retirement) or the impact of divorcing at later ages.

Most studies on the relationship between divorce and retirement wealth use HRS data for analysis, and all find that those who are ever divorced have less wealth at older ages than those who are continuously married. Furthermore, this negative differential is greater for divorced women than for divorced men.

For example, using 1992 HRS data, Wilmoth and Koso (2002) find that individuals aged 51-61 who are currently unmarried and have been divorced once have 73 percent lower wealth compared to those who are continuously married (controlling for demographic, work, and health-related factors). Those who are divorced twice have 82 percent lower wealth than those who are continuously married. They also find that previous divorce can have a long term impact, even for those who remarry: individuals who have divorced once or twice but are currently remarried have 24 percent and 52 percent less wealth, respectively, than the continuously married. The adverse effects of divorce are more pronounced for women than for men. They find that women who were divorced once have 79 percent less wealth than women who are continuously married,

whereas men who were divorced once have 64 percent less wealth. Men and women who divorce twice have 89 percent and 69 percent, respectively, less wealth than their continuously married counterparts.

Sharma (2015) uses RAND HRS data to estimate a fixed-effects model of change in wealth. Like Wilmoth and Koso, he finds that HRS respondents who divorce between the 2004 and 2010 HRS interviews have less average wealth in 2010, when compared to those who did not divorce, and women are more negatively affected. According to his analysis, divorced women lose almost three times as much wealth as divorced men.

The Government Accountability Office (2012) analyzed HRS data from 1992 through 2010 to study the impacts of divorcing after age 50 on assets and income. Similar to Wilmoth and Koso (2002) and Sharma (2015), GAO finds that the negative financial impact of divorce is greater for women than for men. Women who divorced after the age of 50 had incomes on average 41 percent below women who did not divorce. Divorced men in the same cohort only had incomes 23 percent below men who did not divorce. Women who were divorced after 50 experienced a 41 percent decrease in household assets than women who did not divorce, and men who were divorced after 50 experienced a 39 percent reduction in assets. This analysis did not consider remarriage, or the pre- and post-divorce trajectory in asset accumulation, or the role of employment around the time of divorce.

Addo and Lichter (2013) similarly find that women in the HRS who have ever divorced have lower wealth at older ages than women who are continuously married, and this differential is even greater for black women than for white women.

Zissimopoulos, Karney and Rauer (2008) also use HRS data and find that previous divorces are important predictors of wealth levels near retirement, and the impact is different for men than for women. Consistent with results from the other papers described in this section, Zissomopoulos et al. find that past divorce is negatively associated with wealth, even for those who are currently remarried. However, they find that once other demographic characteristics are controlled for in a multivariate regression analysis, these wealth differences between continuously married and currently remarried are not statistically significant. They also find that a first divorce when one is over 45 years of age has a negative impact on wealth relative to a first divorce between ages 26 and 35, but these differences are not statistically significant.

Even though Frech, Painter and Vespa (2017) look at impact of divorce on wealth levels at age 40, rather than wealth at older ages, their results offer support for Zissomopoulos et al.'s findings. Frech et al. use data from the National Longitudinal Survey of Youth 1979 and find that after controlling for selection, women who divorce and then remarry have similar levels of wealth at age 40 to women who are continuously married.

In summary, divorce has a long-term impact on economic well-being. Divorce at age 50 or older is associated with lower assets and income, with the differences being particularly acute for women. Cross-sectional analysis controlling for other factors occurring between the time of the divorce and the survey find limited statistical significance and reduced differences in these

relationships suggesting the actions taken following divorce may mitigate the financial consequences of divorce. In Section 6, we contribute to this literature by exploiting the panel nature of the HRS to clarify how assets at ages 65 and older differ by the timing of the marital disruption.

3. Division of Property in Divorce

One of the most difficult financial tasks associated with divorce is dividing marital property. Marital property, also referred to as communal property, is generally property that was acquired by either spouse during the marriage. It consists of all income and wages, any real property (i.e., land and associated buildings, mineral rights, etc.), business interests, professional licenses, pensions, retirement, savings, and checking accounts, injury settlements and all annuities and money market accounts acquired or earned by either spouse in a marriage. This includes the income, interest and appreciation earned from the property as well as any debt incurred by either spouse during the marriage.

Separate property usually consists of only the real property, income and wages earned before the marriage, real property acquired with separate property, and any gift or inheritance received by one spouse during the marriage.

In a divorce or dissolution, spouses keep their separate property, while marital property is divided. If the parties of a divorce cannot agree to a division the courts will decide how the marital property will be divided. In a contested divorce regarding the division of marital property, all marital property is subject to division among the spouses according to marital and family code in the state.

Generally states have either community property or equitable distribution laws when dividing assets in a contested divorce. Community property states typically divide assets deemed marital property evenly between the two spouses. Nine states--Arizona, California, Idaho, Louisiana, Nevada, New Mexico, Texas, Washington, and Wisconsin--are community property states. However, individual states do differ at which point equal division is implemented. For example, Texas courts, devise a division of community property in a manner that the, "court deems just and right" in a contested divorce (Texas Statutes, 1997), similar to the proceedings of division in an equitable distribution state.

The other 41 states use equitable distribution laws to divide assets between spouses. Equitable distribution, rather than dividing all assets equally by default, considers a list of circumstances that might warrant the unequal division of assets between spouses. When considering an equitable division a court generally considers factors such as the income and property of each party at the time of marriage, the age, earnings capability and health of each spouse, health insurance benefits lost in separation, the length of marriage, the financial need of a

custodial parent, and the wasteful financial behavior of either spouse, among others. Some equitable distribution states, New Hampshire for example, default to an equal division of assets, as occurs in community property states, unless the court finds some mitigating circumstance to warrant an unequal but equitable distribution. Most equitable distribution states, particularly before the Uniform Marriage and Divorce Act of 1970 (UMDA), held laws that divided property between spouses by whose name was on the title of the property. The implementation of UMDA made the division of assets more equitable for the secondary earner. The last title-based state, Mississippi, switched to an equitable distribution system in 1989.

Retirement assets are generally considered marital assets and can be divided as part of the settlement process. Division of retirement assets typically follows one of either the equitable distribution or community property laws with no persistent or distinct differences in their treatment from other assets. Employer-sponsored defined contribution (DC) retirement accounts and Individual Retirement Accounts (IRAs) are legally valued at the current account balance (less any outstanding loans). In the event of divorce, money from a DC account holder to a spouse is not subject to a 10 percent early withdrawal penalty even if the recipient does not roll over those funds into his/her own tax-qualified retirement account, such as an IRA, but the recipient will owe taxes on the transfer amount. However, a distribution from an IRA account holder to a spouse is subject to a 10 percent early withdrawal penalty (in addition to taxes), unless the recipient is over 59½ or rolls over those funds into his/her own IRA.

Because an employer-sponsored defined benefit (DB) retirement plan does not accrue in a separate account for the participant but instead promises to pay the participant a specific benefit at retirement, valuation is not as straightforward as valuation of a DC plan or IRA. In general, the value of a Defined Benefit account is determined in the division of assets. The non-participant spouse may take his/her negotiated share of the DB plan as a lump sum distribution or take a portion of each benefit payment once the participant starts to receive benefit payments (New Hampshire Statutes, 2004).

The Employee Retirement Income Security Act of 1974 (ERISA) established rules for employer-sponsored retirement plans, including the usage of qualified domestic relation orders (QDRO) as a legal mechanism for dividing retirement plans at divorce. QDROs are court orders that identify another individual (usually a spouse, former spouse, child or dependent) as having a legal claim to part or all of a retirement account other than the beneficiaries on the account. In a contested divorce, the value of an individual's retirement plan will be considered in both community property and equitable distribution states. QDROs are limited by what a retirement plan's administration permits. Most plans have a limited set of available QDRO options in the case of a divorce. Knapp (2014) highlights three common types of asset division through QDROs:

1. Separation of Accounts: The spouse receiving the benefits through the QDRO has an account established in his or her name. Vesting rights generally depend on the vesting

of the beneficiary at the time of divorce. Whether the spouse retains the account or rolls assets over to an IRA depends on the plan's rules.

2. Time Rule Formula: The spouse receiving the benefits through the QDRO is entitled to 50 percent × the fraction of plan credits accumulated during the marriage × final benefits. The actual terms, e.g., 50 percent, may be determined as part of the QDRO.

3. Flat Dollar: The spouse receiving the benefits through the QDRO receives a fixed dollar amount per month.

Additionally, public pension plans are not covered by ERISA, but will typically have their own orders that are similar to QDROs.

Social Security benefits are governed by federal law and are not explicitly implicated in division of assets in contested divorces. If the marriage lasted at least 10 years a divorced spouse can claim the larger of either 50 percent of the ex-spouse's full-retirement age (FRA) benefit or a benefit based on his or her own earnings history. The divorced spouse can claim a spousal benefit if he or she is at least 62 and if the ex-spouse has claimed benefits or is eligible to claim and the marriage ended more than two years ago. Additionally, if an ex-spouse dies, then an individual is eligible to collect a certain percentage of the ex-spouse's benefit or his or her own earned benefit. The percent of the ex-spouse's benefit will depend on the ex-spouse's benefit claiming history. The divorced survivor benefit can be collected as young as age 60. If an individual remarries then he or she is no longer eligible to receive the divorced spouse or survivor benefit.[2] Regardless of whether a divorced individual collects all or part of a Social Security benefit based on his or her ex-spouse's benefit, the ex-spouse will still be eligible to receive the same benefit. An individual collecting Social Security benefits based on an ex-spouse's benefit otherwise observes the same benefit rules as current spouse or survivor's benefits. For the divorced spouse benefit, these rules include that a benefit may be reduced if it is claimed prior to the divorced spouse's full-retirement age. This reduction can be up to 25 percent if born before 1937, and it is gradually increasing for younger birth cohorts. The maximum reduction for those born after 1959 will be 35 percent. Additionally, divorced spouse benefits do not receive delayed retirement credits after the full-retirement age, meaning there is no incentive to delay claiming beyond this age. The penalty for claiming a survivor benefit before the full-retirement age can be up to 28.5 percent, and this limit is not changing for younger birth cohorts.

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[2] There are exceptions to this rule. Remarriage after 60 does not prevent an individual from becoming entitled to benefits based on his or her prior deceased spouse's Social Security earnings record (Social Security Administration, 2017). More generally, individuals can collect benefits on former spouse's record if later marriages end (e.g., by death or divorce).

4. A Simple Model of Asset Accumulation

In this section, we present a simple model of asset accumulation for retirement. The model assumes individuals have homogeneous preferences for retirement security and there is no uncertainty: everyone marries at the same age, works for the same number of years, retires at the same point in the lifecycle, and dies some number of years after retirement. The model compares the lifecycle of someone who does not marry to someone who does marry, and considers the implications for his or her retirement security. The model focuses on
- asset accumulation over the life cycle,
- the role of each household member in contributing to asset accumulation, and
- the timing of divorce.

The simple model demonstrates potential empirical regularities we might observe and provides a framework for thinking about the role of divorce in impacting retirement security.[3] In the next two sections, we will use panel survey data to investigate if the theoretical implications from this simple model are observed empirically.

Model

Suppose that an individual plans to accumulate Y assets by retirement. Moreover, for now also assume that Y corresponds to the amount that makes the individual secure in retirement. If this individual marries, due to economies of scale e, his or her household will only need to accumulate $e \times Y$ by retirement.[4] If a household has no economies of scale, then $e = 2$, which means they will require twice as much assets at retirement as a single individual in order to be retirement secure. Alternatively, if the household has perfect economies of scale, then $e = 1$, which means they will require the same level of assets at retirement as a single individual in order to be retirement secure. Furthermore, we assume that marriage takes place only at the start of the asset accumulation phase.

Figure 1 presents a representation of this simple model of asset accumulation, where the household accumulates assets evenly over the work period (i.e., the period between the start of accumulation and retirement), and decumulates accrued assets evenly after retirement, achieving

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[3] The strong assumptions above could be relaxed to consider the role of differential preferences within a household, delayed marriages, remarriages, and more.

[4] We do not consider consumption over the lifecycle in this simple model – it is assumed the household identifies Y, and adjusts consumption before retirement to ensure Y is achieved. A more complex model would consider tradeoffs in Y to maintain higher levels of consumption before retirement, but that additional complexity is not necessary to illustrate the key points of this chapter.

zero assets by death. The line between P1 and P2 in Figure 1 represents the asset accumulation path for the single household.

Figure 1: Theoretical Model Relating Asset Accumulation and Retirement Security After Divorce
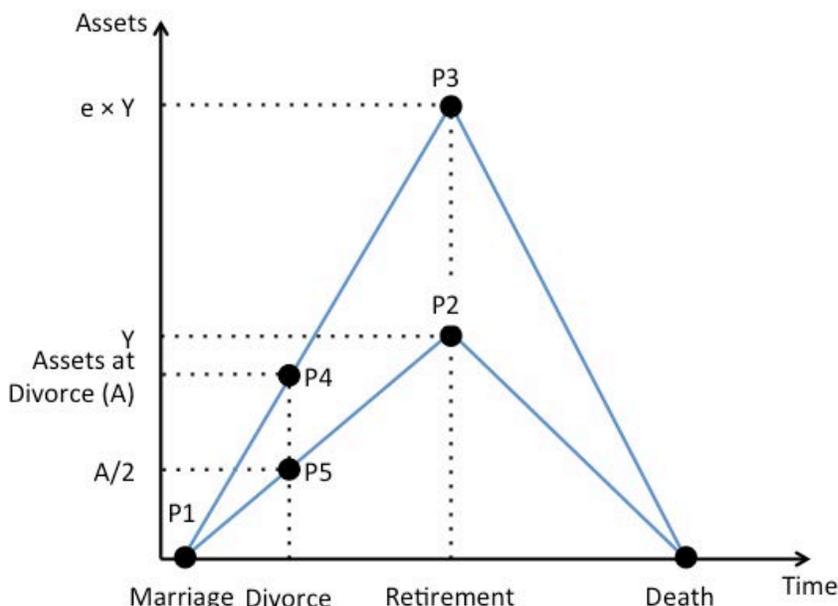
Note: This figure depicts no economies of scale.

Figure 1 suggests that if *e=2*, then both individuals contribute the same amount towards Y after a marriage as they would have without marriage (i.e., the slope from P1 to P3 would be twice the slope of P1 to P2). As economies of scale increase, each individual contributes less in order to achieve the amount required at retirement.

Now, consider a case where a divorce occurs as indicated in Figure 1. Assume no behavioral responses to divorce.[5] In this case, the household accumulates *A* assets by the time of the divorce (represented by the growth in assets between P1 and P4). Assuming assets are divided equally at divorce, the now-divorced individual will have *A/2* assets after the divorce. If both members contributed to asset accumulation evenly, then:

- with no economies of scale, each could continue to save the same percent of income and accumulate *Y* assets by retirement (represented by P5 to P2), and
- with economies of scale, each would have to save a higher percent of income to accumulate *Y*.[6]

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[5] The assumption of no behavioral changes is strong, but the purpose of the simple model is to reflect what behavior would have been had the household remained married. It reflects a lifecycle planning assumptions where the household establishes a plan for retirement at marriage and sets lifetime roles and contributions around that plan.

[6] Since we are assuming no behavioral responses to divorce in terms of a readjustment to *Y*, higher contributions are required.

Differential Roles

The example thus far has considered equal contributions by the married individuals to the household assets in order to achieve $e \times Y$ by retirement. However, marriage may result in household specialization. Figure 2 adds points to Figure 1 to clarify the effect of household specialization. If only one member contributed to asset accumulation before divorce, then after divorce (assuming no behavioral changes) he/she would continue on course to accumulate slightly less than $e \times Y$ assets by retirement (represented by a connection between P5 and P6, which is parallel to the line connecting P4 and P3).

For the other member who did not contribute to assets, absent a behavioral response (e.g., return to work) assets may not change post-divorce (represented by a connection between P5 and P7), or could even be drawn down (represented by a connection between P5 and P8) if assets are required to fund a minimal level of current consumption. This member would be considered retirement insecure, because his/her assets at retirement are less than Y.

Figure 2: Theoretical Impact of Household Specialization on Retirement Security After Divorce
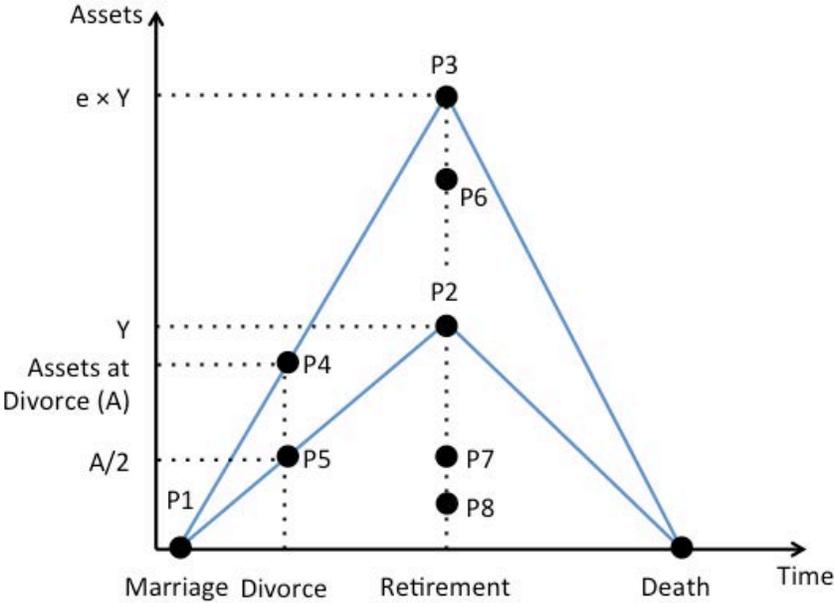
Note: This figure depicts no economies of scale.

From this simple model, we see that the role of each household member in contributing to asset accumulation during the marriage impacts his or her retirement security after divorce.

Equity at Divorce versus Equity at Retirement

The model assumes assets are divided evenly at divorce. This provides equity at the time of divorce, but does not necessarily provide equity at retirement. If a couple specializes such that

one does not work (e.g., raises children) and hence does not develop the ability to accumulate savings (e.g., work experience), then equitable separation of assets during a divorce ignores the compensation required to make the individual as well off at retirement had the couple not divorced. This results because the assets produced by the nonworking spouse are not easily monetized. If equitable division of assets considers the potential lifetime accumulation (i.e., equity at retirement) of a separating household, division of assets would be different. The mechanisms for division of assets considered in Section 3 focused primarily on division of assets at divorce.

In the case of division of assets to ensure equity in retirement, both individuals have asset equity *(e × Y)/2* at retirement. If there are differential roles in asset accumulation within the marriage before divorce, then the member who is the higher contributor would pay a lump sum transfer or alimony payments over time to the member who is the lower contributor to ensure that the lower contributor has *(e × Y)/2* at retirement. In the case of no economies of scale, both individuals accumulate the same assets at retirement as if they had not married in the first place. However, with economies of scale, both individuals are equally worse off relative to *Y*. As economies of scale increase (i.e., *e* decreases), the divorced individuals are made worse off, due to the fact that the economies of scale from marriage reduced their perceived savings burden required to achieve retirement security.

The theoretical impact of household specialization's disproportionate burden on the low contributor to household assets was a policy concern during the divorce policy reform era of the 1970s and 80s. However, it is unknown how much individuals consider this when dividing assets at divorce, or how judges hearing contentious divorces consider the tradeoffs between equity at divorce versus equity at retirement. Another factor, perhaps much less considered, is how the timing of asset accumulation across the lifecycle may impact the difference between equity at divorce and equity at retirement.

Timing of Asset Accumulation

The timing of asset accumulation in relation to a divorce can exacerbate the consequences of household specialization. We consider an extreme example where the household plans to delay saving for retirement until well into the asset accumulation phase of the life cycle.

As shown in Figure 3, suppose that a household accumulates no assets over the first half of the work life and divorces at this halfway point. Also, continue the assumption that the household specializes, and so only one member contributes to asset accumulation. If no assets are accumulated by divorce, then division of assets at divorce yields zero transfers. For the contributor, after divorce he or she will begin contributing, achieving *e × Y* by retirement

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(represented by a connection between P12 and P3).[7] In doing so, the contributor exceeds his or her retirement needs of *Y*. For the non-contributor, he or she remains with zero assets (represented by a connection between P12 and P13). This means that the non-contributor is made worse off under an asset accumulation scheme that delays the accrual of assets for retirement.

Alternatively, if division of assets ensured equity at retirement, then assets would be *(e × Y)/2* for each member of the divorcing household. This would require a transfer of *(e × Y)/2* to the non-contributor, requiring the contributor to go into debt, or the transfer could be made at retirement without requiring the contributor to go into debt.

In this example, the gap between equity at retirement (*(e × Y)/2*) and equity at divorce (*A/2*) increases as assets at divorce (*A*) go to zero. Hence the timing of asset accumulation in relation to a divorce exacerbates the consequences of household specialization.

The timing of divorce also has implications for an individual's ability to rebuild assets lost in a divorce. Individuals divorcing early in working life may choose to undertake a new career, get re-trained, or make other human capital investment given the long horizon until retirement. The longer horizon allows early divorcees more time to rebuild assets lost in divorce. This becomes more important as household economies of scale increase, as this will cause the asset accumulation path to be substantially different between married and single households. Individuals divorcing near retirement have a shorter time period to rebuild assets. In lieu of a substantial behavioral response (e.g., significant reductions in current consumption), asset allocation at divorce is more deterministic of their retirement security (or insecurity).

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[7] This assumes no behavioral response. It is likely that the primary contributor would decrease savings towards *Y* and consume more during his or her working life.

Figure 3: Theoretical Impact of Deferred Asset Accumulation on Retirement Security After Divorce
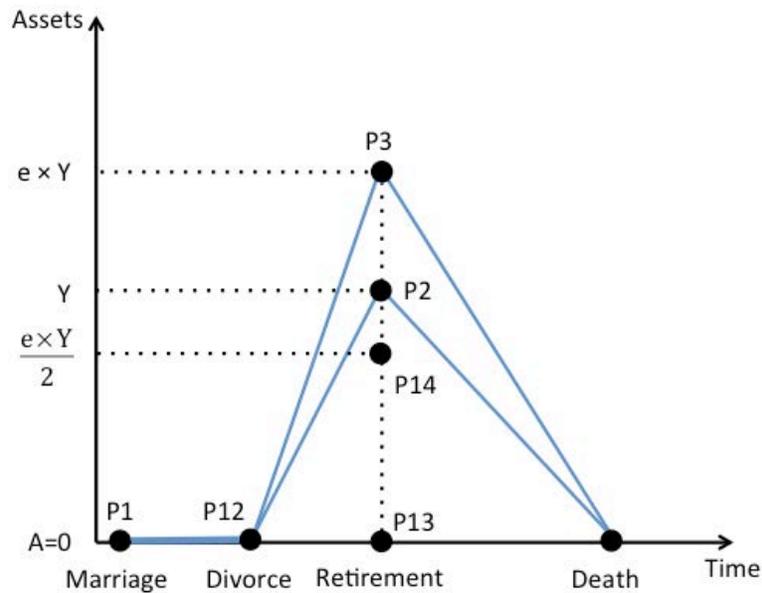
Key Takeaways

The simple model of asset accumulation, setting aside the effects of economies of scale and behavioral responses, demonstrates that two factors
- the role of each household member in contributing to asset accumulation, and
- the planned timing of asset accumulation

can exacerbate the effect of divorce on retirement insecurity. The implications of the simple model include:

1. larger asset accumulation differentials between spouses will result in less assets at retirement for the low-contributing member (i.e., low earners in divorcing couple are more likely to be retirement insecure)
2. the timing of divorce will have a more significant impact if people delay savings for retirement

The simple model does not allow for behavioral responses to divorce such as changing labor supply after a divorce. If there is a higher probability of successfully making that transition at a younger age, then divorce may have an especially large effect on retirement security for older non-contributing members of households that have delayed asset accumulation.

5. Data

We use the biennial HRS (1992–2014) to examine the effects of divorce on economic outcomes. The HRS is a nationally representative sample of households where at least one member is age 51–61 in the original 1992 cohort, or age 51–56 in the new cohorts added to the study in 1998, 2004, and 2010. In 1998, the HRS added both younger and older cohorts. The additional cohorts made the HRS a representative panel study of people age 51 and over whose sample is added to every six years to capture newer cohorts of individuals ages 51-56. If the household is comprised of a couple, then both individuals are interviewed, even if one of the individuals is younger or older than the targeted age group. If the couple separates, the HRS makes great efforts to follow both individuals, although attrition is higher among individuals whose most recent marital status is divorced relative to currently married individuals, for both men and women.

At a respondent's first interview, the HRS collects a retrospective marital history, including approximate dates of previous marriages start and end, and the reason for the marriages ending. This information can be used to look at outcomes of those who divorce at ages below 50 relative to outcomes of those who divorce after 50 (i.e., during the HRS interview range).

In each interview wave, the HRS collects information on demographics, health, wealth, income, insurance, family structure, and retirement plans and expectations. Wealth measures, other than employer-sponsored retirement plan data, are collected at the household level. Asset measures include self-reported value of housing wealth, value of investments, IRAs, employer-sponsored DC accounts, savings accounts (including CDs, government bonds), and the value of businesses, other residences, mortgages, and other debts. We supplement our data on DC wealth by using the imputed measures of Gustman, Steinmeier and Tabatabai (2014) and updating these values through 2014.

Table 1 presents the demographic description of our sample. For these demographic characteristics we use responses from the survey wave conducted when the respondents are ages 65 to 66. For example, for respondents born in 1931, we use their responses from the 1996 survey wave; for respondents born in 1932 or 1933, we use their responses from the 1998 survey wave. Our tabulations in Table 1 are unweighted, as sample weights pertain to specific interview waves and the results in Table 1 represent a comparison of outcomes at a specific age (65 or 66) corresponding to different interview waves for each individual.

The HRS weights are based on cross-sectional comparisons with the Current Population Survey (CPS) and the American Community Survey (ACS) for a given survey year. Consequently, using the weights across survey years would be inappropriate. More fundamentally the HRS weighting accounts only for current marital status and not for marital history, so the weights do not provide a nationally representative sample of divorce histories for

comparative purposes. This concern is particularly important for our later analyses of retirement security based on different marital histories. Consequently, all of our results should be interpreted as reflective of the HRS sample's outcomes, and may not be nationally representative. However, there currently are not better surveys or administrative datasets that capture a large sample of households before and after a separation.

Table 1 describes the full sample, as well as the sample of those who have been continuously married and never divorced nor widowed, the sample of those who have been divorced at least once, and the sample of those who have never been married. By construction, the ages are similar across the groups. Continuously married couples tend to be very close in age, while divorcing individuals tend to remarry younger spouses. While the continuously married tend to be from very long marriages (43 years on average), the length of the most recent marriage for those who ever divorce is still 22 years on average, suggesting that many divorcees move on to long new marriages. Of the individuals who have ever divorced, 50 percent are currently married at ages 65 or 66, and an additional 10 percent are currently widowed, suggesting at least 60 percent of divorced individuals remarry. Additionally, as other studies have noted (Brown and Lin, 2012), there is variation in divorce experience by race, with black individuals divorcing at greater rates relative to white individuals.

Those who are continuously married are less likely to be working full time, more likely to be retired at age 65 or 66, and less likely to report being in poor or fair health than those who are ever divorced or never married. Conditional on working full time, those who are continuously married have higher income at age 65 or 66 than those who are ever divorced or never married. Over 34 percent of those who are continuously married are in the 1931-1936 birth cohort, whereas 26 percent of those who have ever been divorced are in the 1931-1936 birth cohort. Those who have ever been divorced are more likely to be in the younger birth cohorts than those who have never been divorced.

Table 1: Sample Description at Age 65 or 66

Demographic Characteristic (Percent of sample, unless otherwise stated)	Full Sample	Continuously Married	Ever Divorced	Never Married
Age	65.5	65.5	65.4	65.5
Average age difference with current spouse (age – spouse age, in years)	1.2	0.1	3.7	
Average length of current marriage (years)	36.1	42.7	22.3	
Male	47.0	52.7	47.4	42.8
Currently married	68.0	100.0	50.0	0
Currently divorced	13.5	0	34.2	0
Currently widowed	12.2	0	9.5	0
White, non-Hispanic	79.0	84.4	77.1	65.2
Black	16.4	11.1	18.6	27.8
Working full-time	17.9	17.2	19.9	19.2
Working part-time	4.5	4.4	4.5	6.4
Retired	66.4	66.7	66.5	64.6
Unemployed	1.5	1.3	1.8	0.3
Average income (conditional on full-time work, 2014 dollars)	$43,972	$46,440	$43,510	$41,923
Have children	93.0	96.0	95.0	27.0
Average number of children (conditional on having children)	3.6	3.2	4.1	2.8
Average age of children	38.2	38.0	38.2	38.6
1931-36 birth cohort (HRS1)	31.2	33.6	25.7	31.6
1937-41 birth cohort (HRS2)	45.4	44.9	46.4	41.2
1942-47 birth cohort (WB)	16.5	16.4	18.4	16.6
1948-53 birth cohort (EBB)*	6.9	5.2	9.4	10.5
Less than high school	22.8	20	22	26.2
High school diploma or some college	56.9	57	58.9	47
Undergraduate degree	11.3	13	10.3	12.5
Graduate degree	9	10	8.9	14.4
Self report poor or fair health**	27.2	22.1	31.2	31.9
Sample Size	8,808	4,142	3,159	313

Notes: Unweighted descriptive statistics of the sample of individuals aged 65 or 66 in the HRS surveys (1992-2014), using only age-eligible survey members for their respective birth cohorts (original HRS cohort, born 1931-41, abbr. HRS1 and HRS2; war baby cohort, born 1942-47, abbr. WB; early baby boom cohort, born 1948-53, abbr. EBB). Age 65 or 66 is chosen because the HRS is a biannual survey. If individuals had interviews at both ages, the response from the first was used. The full sample excludes observations where labor force status, age, gender, marital status, race, education, or assets are missing. The continuously married is a subset of the full sample reflecting respondents who are currently married and have had only one marriage. The ever divorced is a subset of the full sample reflecting respondents who report ever being divorced prior to the interview. The never married is a subset of the full sample reflecting respondents who report never being married. *EBB cohort will only reflect individuals born in 1948-49, because only these individuals will have reached age 65 or 66 by 2014. **Approximately 0-0.15% of observations are missing health status and are excluded from this percentage only.

Table 1 describes our sample in terms of differences in marital history, but does not account for timing of divorce. As mentioned in Section 4, the timing of planned asset accumulation during a marriage can alter the impact of divorce. Additionally, the timing of divorce may impact asset accumulation following a divorce because an individual's ability to respond to the divorce, such as work and savings, will depend on the need to change behavior relative to his or her pre-divorce household specialization. The marital histories in the HRS allow us to compare households that are married in a particular age range to households that experienced a divorce in a particular age range.[8] For our analyses, we consider two age ranges, 30 to 39 and 50 to 59, which are chosen to reflect two critical time points. With over 90 percent of the sample having children and the average age of these children currently being 38, ages 30-39 represent a critical time point where asset accumulation might have been relatively low due to the raising of children and individuals being relatively early on in their careers. At this point, divorce may have a larger negative impact on the individual in the household who has contributed the least to savings because he or she will be the least robust in terms of ability to accumulate savings once divorced. This can become a persistent detriment to asset accumulation if this individual retains responsibility for children, whose care may limit his or her work and savings response to the divorce.

We also consider the age 50-59 group. These individuals represent a different sample because their children are much older and the households have been together longer on average. Therefore, divorce for the individual in the household who has or would contribute the least to savings would be relatively better compared to this type of individual divorcing at ages 30-39 because he or she may have fewer persistent obligations after the marriage and because household asset accumulation for retirement will be further along. However, his or her situation could be relatively worse if his or her pre-divorce household specialization was such that it requires a dramatic response (e.g., re-entry into the labor force) after divorce in order to return to asset accumulation.

Table 2 provides a comparison of individuals who were married in these age ranges to individuals who divorced in these age ranges. Note that these comparison groups are not mutually exclusive: for example, an individual may become divorced in her thirties, and then again in her fifties, or an individual may be married in her thirties and then become divorced in her fifties. Individuals who divorced in these age ranges but are currently married at age 65 or 66 are married to younger individuals on average, and this gap widens for those who divorced between ages 50 and 59. As expected, those divorcing in either age range are less likely to be currently married, and if they are, the duration of the current marriage is shorter. Additionally,

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[8] Individuals married in an age range may divorce at a later time, and individuals divorcing during this age range may remarry within or after the age range.

those who divorced between ages 50 and 59 are 21 percentage points less likely to be remarried by ages 65 or 66 than those who divorced between ages 30 and 39.

Regarding work and retirement, those who divorced between ages 30-39 are 3 percentage points more likely to be working full-time at age 65 or 66 compared to those who were married during this age range, and this gap increases to 6 percentage points for those who divorced between ages 50-59. These gaps are larger than the 2.7 percentage point difference between the continuously married and ever divorced in Table 1, which suggests that remarriage may play an important role in reducing full-time work at age 65 or 66. The fraction reporting being retired looks similar across the groups, despite the gaps in full-time work. The difference in full-time work is driven by lower rates of individuals not participating in the labor force in the married sample.

With regards to children, individuals who divorced in their thirties are less likely to have children than the other groups, and individuals who divorced in their fifties are likely to have younger children on average. Those who divorced during either age range, similar to what was observed in Table 1, are more likely to be drawn from the younger HRS cohorts and have no systematic differences in education with their married counterparts. Interestingly, the fraction reporting poor or fair health is greater for individuals who divorced in their thirties compared to those who divorced later.

The descriptive statistics in Table 2 highlight some key differences between groups having alternative marital experiences during certain age ranges that were not clear from the current and ever-divorced experiential indicators in Table 1. First, while divorced individuals are more likely to be working full-time at ages 65 or 66 relative to those who were married, this gap expands when divorce occurs at later ages. This is suggestive evidence that the timing of divorce may matter for retirement in order to achieve retirement security. Second, individuals who divorced at later ages are less likely to be remarried. Since marriage provides economies of scale, continued singlehood may result in greater risk for retirement insecurity. Third, more people report being in poor or fair health among individuals who divorced between ages 30 and 39. This could suggest that disruptive marital events early in life have persistent consequences. In the next section we will explore how asset accumulation among the groups in Tables 1 and 2 relate to the marital disruption, conduct multivariate analyses to see if these differences persist controlling for other mitigating risk factors, explore the separation of assets among households separating after their first HRS interview, and analyze the impact of separation on decumulation behavior.

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Table 2: Sample Description of Divorce History Comparison Groups at Age 65 or 66

Demographic Characteristic (Percent of sample, unless otherwise stated)	Married while age 30-39	Divorced while age 30-39	Married while age 50-59	Divorced while age 50-59
Age	65.5	65.4	65.5	65.5
Average age difference with spouse (respondent age – spouse age, in years)	0.7	3.9	1.0	6.7
Average length of current marriage (years)	38.9	22.0	37.4	8.7
Male	46.9	47.5	50.8	52.5
Currently married	75.7	54.9	82.4	33.5
Currently divorced	9.3	31.0	7.4	53.5
Currently widowed	13.2	8.4	7.7	5.7
White, non-Hispanic	81.2	78.7	81.6	82.6
Black	14.5	17.2	14.1	12.4
Working full-time	17.5	20.3	17.8	23.3
Working part-time	4.3	5.1	4.5	3.7
Retired	66.6	66.2	66.5	66.2
Unemployed	1.4	1.8	1.3	2.8
Average income (conditional on full-time work, 2014 dollars)	$44,046	$43,686	$44,727	$46,025
Have children	97.0	93.0	96.0	97.0
Average number of children (conditional on having children)	3.5	4.1	3.6	4.0
Average age of children	38.2	38.3	38.2	36.6
1931-36 birth cohort (HRS1)	33.3	21.9	30.1	27.2
1937-41 birth cohort (HRS2)	44.9	48.8	47.9	48.7
1942-47 birth cohort (WB)	16.1	19.5	16.2	15.8
1948-53 birth cohort (EBB)*	5.7	9.7	5.7	8.3
Less than high school	22.1	19.6	22	17.6
High school diploma or some college	57.7	59.2	57.3	61.4
Undergraduate degree	11.5	11.2	11.7	12
Graduate degree	8.6	9.9	9	8.9
Self report poor or fair health**	25.6	30.5	25.8	25.6
Sample Size	6,704	1,208	6,908	493

Notes: Unweighted descriptive statistics of specific subsamples of individuals aged 65 or 66 in the HRS surveys (1992-2014). See notes to table 1 for a further description of the full sample. The "married while age 30-39" is a subset of the full sample reflecting respondents who report during their HRS interviews being married, but not divorced or widowed, while in their thirties. The "divorced while age 30-39" is a subset of the full sample reflecting respondents who report during their HRS interviews becoming divorced while in their thirties. The groups for ages 50-59 are similarly defined. *EBB cohort will only reflect individuals born in 1948-49, because only these individuals will have reached age 65 or 66 by 2014. **Approximately 0.07-0.24% of observations are missing health status and are excluded from this percentage only.

6. Results

Our key research questions are:

1. How do older divorcees differ from those who divorced when young in terms of retirement wealth once they reach age 65 and later? How do factors such as remarriage or post-divorce employment impact retirement wealth?
2. How do households divorcing after 50 divide assets, particularly retirement assets, at separation?
3. Do individuals who divorce after 50 differ from continually married households in their retirement decumulation behavior, including Social Security claiming patterns?

We begin by presenting results from descriptive analyses. The descriptive analyses compare wealth by marital history, comparing individuals who are never divorced with those who have experienced at least one divorce and comparing those who have experience divorce at different times in their lives. In comparing wealth, we focus on the differences in median wealth in order to prevent extreme values among our subsamples from driving the observed differences. We then compare decumulation behavior by marital history. The descriptive analysis is followed by multivariate regression analysis in which we explore the relationship between assets and divorce, considering also the roles of remarriage, children, marriage length, educational attainment, and work history. We conclude by exploring the division of assets among households separating after their first HRS interview, and analyze the impact of separation leading to divorce on decumulation behavior.[9]

Differences in Wealth by Marital History

In this subsection, we begin by comparing wealth by marital history. We compare those who have never been divorced to those who have ever been divorced, and we also compare those who experienced a divorce earlier in life (between the ages of 30 and 39) to those who experienced a divorce later in life (between the ages of 50 and 59). Note that these comparisons do not control for demographic and behavioral differences between the groups, so differences may be the results of differences associated with, but not caused by, marital history.

Comparing wealth of married individuals who have never been divorced to wealth of individuals who have experienced divorce, it is apparent that, at the median, those who have ever been divorced have less median wealth at age 65 or 66 than married individuals who have never

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[9] All the results are unweighted and should be interpreted as reflective of the HRS sample's outcomes, and may not be nationally representative or account for HRS's complex sample design. See chapter 5 for a discussion on why unweighted estimates are used.

been divorced (Table 3). This finding is consistent with the previous literature (Amato, 2000). The difference in wealth between those who are continuously married and those who have ever been divorced is much greater for women than for men: median wealth at age 65 or 66 for men who have been divorced is more than 58 percent the median wealth of married men who have never been divorced, whereas median wealth for women at age 65 or 66 who have experienced divorce is 32 percent of median wealth for women who have been continuously married. These differences are consistent with the simple model presented in Section 4, where men are the more significant contributors to household asset accumulation.

This negative impact of divorce on wealth also holds regardless of current marital status, although the impact is moderated for those who are currently married. Regardless of labor force status and whether the individual has children, those who are continuously married have more wealth at the median than those who have ever experienced divorce.

Table 3: Total Household Wealth at age 65 or 66 of Continuously Married Individuals and Ever-Divorced Individuals

Median Total Household Wealth (2014 Dollars)	Men		Women	
	Continuously Married	Ever Divorced	Continuously Married	Ever Divorced
Overall	358,009	208,416	364,315	116,958
By Marital Status:				
Married	358,009	284,639	364,315	240,660
Separated or Divorced		104,000		64,481
Widowed		115,069		58,150
By Retirement Status:				
Working full-time	439,885	262,962	334,834	141,602
Not working full-time	336,949	195,963	366,500	112,002
By Children:				
Don't have children	408,920	152,293	381,620	193,047
Have Children	357,279	210,456	363,119	115,802
Sample Size	2,181	1,497	1,961	1,662

Notes: Unweighted median total household wealth in 2014 dollars for specific subsamples of individuals aged 65 or 66 in the HRS surveys (1992-2014). See notes to table 1 for a further description of the full sample and subsamples. Total household wealth is the net value of total wealth. It excludes annuitable wealth, such as defined benefit plans and Social Security. Total wealth includes the respondent's self-reported value of checking, savings, or money market accounts, CDs, government bonds, plus the net value of primary and other real estate, vehicles, businesses, IRA accounts, Keogh accounts, defined contribution plans (e.g., 401(k), 403(b), and TSP), stocks, mutual funds, investment trusts, bonds, and other savings, and less any others debts not accounted for in the net values of the other assets (e.g., credit card balances, medical debts, life insurance policy loans, loans from relatives).

In addition to finding that those who ever divorce have lower wealth than those who are continuously married, we also find that there are important differences in wealth at age 65 or 66 depending on when an individual divorces. Table 4 compares total wealth at age 65 or 66 of those who divorced in their thirties with those who divorced in their fifties. Overall, median

wealth for men and women who divorced earlier is greater than median wealth for men and women who divorced later. However, this result is not consistent across current marital status or labor force status. For example, of those who are currently divorced, men and women who were divorced later have greater median wealth than those who were divorced earlier. It is worth noting that, especially for those who were divorced in their fifties, many of these subgroups have very small samples. For example, only three men and 21 women who divorced in their fifties are widowed at age 65 or 66.

Table 4: Total Household Wealth at Age 65 or 66 of Early and Late Divorcees

Median Total Household Wealth (2014 Dollars)	Men		Women	
	Divorced while age 30-39	Divorced while age 50-59	Divorced while age 30-39	Divorced while age 50-59
Overall	213,798	191,000	126,002	121,276
By Marital Status:				
Married	291,897	279,541	243,269	206,000
Separated or Divorced	79,737	106,853	55,747	109,627
Widowed	57,901	165,000	47,131	17,027
By Retirement Status:				
Working full-time	207,486	278,775	214,303	110,850
Not working full-time	214,385	186,319	114,519	131,394
By Children:				
Don't have children	159,306	26,273	260,726	140,766
Have Children	214,894	193,618	120,000	121,276
Sample Size	574	259	634	234

Notes: Unweighted median total household wealth in 2014 dollars for specific subsamples of individuals aged 65 or 66 in the HRS surveys (1992-2014). See notes to table 1 for a further description of the full sample and subsamples, or table 2 for a description of the divorce categories, or table 3 for a description of what comprises total household wealth.

Table 5 compares retirement wealth at age 65 or 66 of continuously married individuals to that of individuals who have ever been divorced. We measure retirement wealth as liquid retirement assets, such as IRAs and employer-sponsored DC accounts, because they are easy for an individual to value by observing account balances.

The left-hand side of the table shows the percentage of each sample that has non-zero retirement wealth at ages 65 and 66, and the right hand side of the table shows median retirement wealth, conditional on non-zero retirement wealth.

A larger percentage of continuously married individuals have positive retirement wealth than ever-divorced individuals, and a greater percentage of men have retirement assets compared to women. Only 44 percent of women who have ever been divorced have retirement assets. Divorcees who are currently remarried are more likely to have positive retirement wealth than current divorcees or widows and widowers. Not surprisingly, a larger percentage of those who are working full time have retirement assets than those who are not working full time. Lastly,

continuously married men and women who do not have children are more likely to have retirement assets than those who do have children, but the reverse is true for those who have ever been divorced.

Conditional on having non-zero retirement wealth, those who are continuously married also have more retirement assets than those who have ever been divorced. We see that remarriage partly mitigates this difference in retirement assets: divorcees who are remarried at age 65 or 66 have greater retirement wealth than those are currently divorced or widowed.

Table 5: Retirement Wealth at Age 65 or 66 of Continuously Married Individuals and Ever-divorced Individuals

	Percent with non-zero retirement wealth				Median Retirement Wealth Conditional on Non-zero Retirement Wealth (1000s of 2014 Dollars)			
	Men		Women		Men		Women	
	Cont. Married	Ever Divorced	Cont. Married	Ever Divorced	Cont. Married	Ever Divorced	Cont. Married	Ever Divorced
Overall	64.7%	54.9%	62.1%	44.0%	121.0	100.1	116.9	64.0
By Marital Status:								
Married	64.7%	63.4%	62.1%	58.6%	121.0	105.7	116.9	100.8
Separated or Divorced		35.7%		36.9%		65.8		48.7
Widowed		31.4%		30.6%		86.9		41.2
By Retirement Status:								
Working full-time	72.9%	64.4%	76.0%	65.2%	126.8	100.6	83.4	51.5
Not working full-time	62.2%	51.9%	60.5%	39.9%	119.0	99.9	125.1	72.0
By Children:								
Don't have children	65.3%	53.8%	65.3%	43.7%	206.2	76.8	140.9	74.1
Have Children	64.7%	55.0%	62.0%	44.1%	118.6	101.0	116.4	62.9
Sample Size	2,181	1,497	1,961	1,662	1,411	822	1,218	732

Notes: Unweighted median retirement wealth in 1000s of 2014 dollars for specific subsamples of individuals aged 65 or 66 in the HRS surveys (1992-2014). See notes to table 1 for a further description of the full sample and subsamples. Total retirement wealth is the net value of retirement wealth excluding annuitable wealth, such as defined benefit plans and Social Security. It includes the respondent's self-reported net value of IRA accounts, Keogh accounts, and defined contribution plans (e.g., 401(k), 403(b), and TSP).

Table 6 compares retirement wealth at age 65 or 66 by divorce timing and demographic characteristics. Overall, men and women who divorced early are more likely to have positive retirement wealth than those who divorced later. However, for each marital status category, men and women who divorced later are more likely to have positive retirement wealth. It is important

to note that the rate of being re-married at age 65-66 is very different depending on divorce timing: recall from Table 2 that 55 percent of people who divorced between the ages of 30 and 39 are now married at ages 65 or 66, whereas only 34 percent of people who divorced between the ages of 50 and 59 are now married at 65 or 66.

Comparing median retirement wealth levels, conditional on having retirement wealth, we find mixed results by gender. Men who divorced earlier have higher median retirement wealth than men who divorced later, whereas women who divorced earlier have lower median retirement wealth than women who divorced later. These results are consistent with the simple theory in Section 4 regarding the timing of planned asset accumulation. If households plan to delay asset accumulation until later in life, the early divorce will mean fewer assets set aside for retirement at divorce for the low earner, typically the woman in this age group.

As with Table 4, it is worth noting that some of these subgroups have very small samples. For example, there are only three men who divorced between ages 50-59 who do not have any children and have non-zero retirement.

Table 6: Retirement Wealth at Age 65 or 66 of Early and Late Divorcees

	Percent with Non-zero Retirement Wealth				Median Retirement Wealth, Conditional on Non-zero Retirement Wealth (1000s of 2014 Dollars)			
	Men		Women		Men		Women	
	Divorced 30-39	Divorced 50-59	Divorced 30-39	Divorced 50-59	Divorced 30-39	Divorced 50-59	Divorced 30-39	Divorced 50-59
Overall	56.6%	54.1%	46.4%	45.7%	98.8	68.2	60.5	64.6
By Marital Status:								
Married	66.0%	68.6%	61.9%	68.1%	108.7	81.4	101.7	90.4
Separated or Divorced	31.9%	37.7%	36.5%	40.7%	47.8	46.5	46.5	58.1
Widowed	28.6%	33.3%	30.7%	32.0%	188.0	25.0	38.9	40.9
By Retirement Status:								
Working full-time	65.4%	64.6%	70.6%	62.0%	107.8	62.2	76.0	33.9
Not working full-time	53.9%	50.5%	41.3%	41.3%	97.5	68.2	58.7	72.6
By Children:								
Don't have children	57.1%	30.0%	41.7%	66.7%	68.5	565.0	107.6	122.6
Have Children	56.6%	55.0%	46.8%	45.2%	101.7	67.6	57.7	62.7
Sample Size	574	259	634	234	325	140	294	107

Notes: Unweighted average of total household wealth in 2014 dollars for specific subsamples of individual's aged 65 or 66 in the HRS surveys (1992-2014). See notes to table 1 for a further description of the full sample and subsamples. Total retirement wealth is the net value of retirement wealth excluding annuitable wealth, such as defined benefit plans and Social Security. It includes the respondent's self-reported net value of IRA accounts, Keogh accounts, and defined contribution plans (e.g., 401(k), 403(b), and TSP).

Decumulation of Retirement Wealth

Differences in retirement wealth levels may reflect differences in decumulation behavior at ages 65 or 66. For example, single households do not need to set aside saving for a survivor, thus these household require less precautionary savings and hence assets can be drawn down faster. In this subsection, we compare retirement asset decumulation behavior based on divorce experience.

In Table 7, we compare rates at which respondents draw down sources of retirement wealth at different ages, depending on whether they are continuously married or have ever been divorced. Table 7 presents rates of: 1) annuitizing, cashing out, or withdrawing from an IRA; 2) cashing out or annuitizing an employer sponsored DB or DC plan; 3) receiving DB income; and 4) receiving SS retirement benefits.

Table 7: Retirement Wealth Decumulation of Continuously Married Individuals and Ever-Divorced Individuals

Retirement asset decumulation methods used up to specified age, conditional on holding the corresponding asset	Men		Women	
	Continuously Married	Ever Divorced	Continuously Married	Ever Divorced
Age 62 or 63				
Ever annuitized, cashed out, or took a withdrawal from IRA	32%	37%	38%	43%
Ever cashed out or annuitized DB/DC plan	21%	26%	22%	29%
Currently receiving DB or annuity income	41%	39%	32%	33%
Currently receiving SS retirement benefits	28%	30%	36%	36%
Age 65 or 66				
Ever annuitized, cashed out, or took a withdrawal from IRA	44%	49%	50%	53%
Ever cashed out or annuitized DB/DC plan	24%	26%	25%	33%
Currently receiving DB or annuity income	55%	53%	45%	46%
Currently receiving SS retirement benefits	71%	71%	80%	71%
Age 70 or 71				
Ever annuitized, cashed out, or took a withdrawal from IRA	67%	64%	78%	69%
Ever cashed out or annuitized DB/DC plan	22%	27%	24%	32%
Currently receiving DB or annuity income	67%	61%	56%	59%
Currently receiving SS retirement benefits	97%	96%	94%	96%

Note: Each cell corresponds to the fraction of the sample holding an asset type that has engaged in the decumulation method referenced in each row by the specified age. Sample sizes vary depending on the number of household holding the retirement assets. These sample sizes are available from the authors upon request.

Overall, we observe that decumulation behavior is more frequent at older ages. At ages 62 to 63 and ages 65 to 66, we see that individuals who have ever been divorced are more likely to have taken assets out of an IRA employer sponsored retirement account, when compared to those who have been continuously married. However, men who have ever been divorced are less likely

to be currently receiving DB or annuity income at each age group, compared with men who are continuously married. Also, ever divorced women are less likely to be collecting Social Security benefits at normal retirement age (ages 65/66) than continuously married women. Both of these results are consistent with those who have ever been divorced being more likely to still be working full time at age 65 or 66 than those who are continuously married, as seen in Table 1.

In Table 8, we compare rates at which respondents draw down sources of retirement wealth at different ages, depending on whether they divorced early in life (ages 30-39) or later in life (ages 50-59). At age 62 or 63, those who divorced while in their thirties are more likely to have cashed out or withdrawn from an IRA, DB or DC plan.

At each age group, men who divorced later in life are more likely to be receiving DB or annuity income, but less likely to have claimed Social Security retirement benefits, when compared to men who divorced earlier in life. This result is surprising. It could reflect strategic benefit election since most private benefit plans have retirement ages well before the earliest Social Security claiming age and delaying Social Security increases the monthly payment. Women who divorced later in life are also less likely to have claimed Social Security retirement benefits than those who divorced earlier in life, at each group.

Table 8: Retirement Wealth Decumulation by Age Group of Early and Late Divorcees

Retirement asset decumulation methods used up to specified age, conditional on holding the corresponding asset	Men		Women	
	Divorced 30-39	Divorced 50-59	Divorced 30-39	Divorced 50-59
Age 62 or 63				
Ever annuitized, cashed out, or took a withdrawal from IRA	41%	37%	48%	41%
Ever cashed out DB/DC plan	27%	24%	33%	30%
Currently receiving DB or annuity income	38%	43%	32%	33%
Currently receiving SS retirement benefits	30%	28%	35%	32%
Age 65 or 66				
Ever annuitized, cashed out, or took a withdrawal from IRA	51%	48%	55%	55%
Ever cashed out DB/DC plan	26%	26%	37%	37%
Currently receiving DB or annuity income	50%	64%	44%	41%
Currently receiving SS retirement benefits	72%	69%	72%	68%
Age 70 or 71				
Ever annuitized, cashed out, or took a withdrawal from IRA	65%	63%	70%	67%
Ever cashed out DB/DC plan	28%	32%	37%	38%
Currently receiving DB or annuity income	60%	66%	59%	57%
Currently receiving SS retirement benefits	96%	95%	96%	94%

Note: Each cell corresponds to the fraction of the sample holding an asset type that has engaged in the decumulation method referenced in each row by the specified age. Sample sizes vary depending on the number of household holding the retirement assets. These sample sizes are available from the authors upon request.

Simple comparisons like these conceal the great deal of variation in personal characteristics that could influence both asset accumulation and decumulation behavior between the age at separation and retirement age.[10] For example, if divorcing individuals are more likely to be working prior to separation, then they may be more likely to still be working at ages 65 or 66. Next, we use regression analysis to evaluate accumulated retirement assets by divorce history. Later in this chapter, we will consider decumulation behavior using a matching analysis that links an individual who is married at the first HRS interview but will eventually divorce to similar individuals who do not. In doing so, we attempt to generate a comparison group that can serve as a more valid counterfactual for decumulation behavior had the household not separated.

Relationship Between Divorce and Assets: Multivariate Regression Analysis

In this subsection, we control for the interrelationships between explanatory variables (e.g., work history and number of children) in order to answer our first research question. The bivariate comparisons of continuously married individuals and ever-divorced individuals indicate that those who are continuously married have greater median wealth at age 65 or 66. It is possible that these differences might exist because of systematic differences between the two groups that could otherwise explain this gap. For example, differences could exist in the timing of when assets were measured (macro-economic effects), the education level of different groups, or the health or retirement status.

In Table 9, we present the key outcomes from a regression of log household assets on a number of explanatory variables. In Model 1, we account for just the relationship between being ever divorced and/or currently divorced. Following Kennedy (1981), we calculate a negative relationship between household assets and ever being divorced (-20 percent for both women and men).[11] Since the ever-divorced individuals could have potentially remarried, the cumulative effect of ever being divorced and being currently divorced speaks more to the consequences on household assets of persistent divorce. In this case, the negative relationship is substantially larger (-81 percent for women, and -74 percent for men), compared to those who have been continuously married. As noted, these differences could be driven, in part, by systematic differences between the groups such as those stated above.

Model 2 controls for the interaction of ever-divorced and current marital status, with indicators for the number of children (i.e., in case of nonlinear effects), retirement status,

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[10] For individuals divorcing after their first HRS interview, we use the age at separation. For individuals divorcing before their first HRS interview, we use the age as of their self-reported divorce year.

[11] Kennedy (1981) provides the correct transformation for calculating the marginal effects of dummy variables in a semi-log regression (i.e. where the dependent variable is a logarithm – here total wealth – and the explanatory variable is an indicator variable – e.g., divorced). For an estimated coefficient $\hat{c}$, the marginal effect is $\exp(\hat{c} - 0.5V(\hat{c})) - 1$.

education, interview wave, and self-reported health. Controlling for these factors increases the negative effect on assets for women of ever being divorced, but mitigates it for men. This is consistent with the notion that women are more likely to take care of children, and controlling for the number of children, reveals a larger relationship between assets and ever being divorced for women and a smaller relationship for men. The cumulative relationship of ever being divorced and currently divorced is slightly smaller for women and men in Model 2 than in Model 1.

Having many children (4+) is associated with lower total assets for men and women. Women who are currently divorced with this many children have substantially fewer accumulated assets relative to the continuously married, while women who were previously divorced but currently married have more accumulated assets than the continuously married. For divorced men, the effect of having more children is insignificantly different from zero; however having no children is associated with less wealth accumulation for ever divorced men. Although additional covariates are not shown, Model 2 consistently finds that education and current health are significant and positively associated with total assets.

Model 3 considers the addition of log total self-reported years worked. Table 9 indicates that individuals who work longer have greater assets, but the relationship is only significantly and substantively positive for men. However, when interacted with currently divorced, the result for women is significant and substantively positive, suggesting a behavioral response to increase savings relative to continuously married or remarried women. Using the observed means of the sample for log total years worked, we can calculate the marginal effects of divorce and remarriage for a woman with the average number of years worked. The marginal effects are similar to Models 1 and 2, with divorcing women who do not remarry having 83 percent fewer assets at ages 65 or 66 than their continuously married counterparts, even with the same work experience. Women who remarry accumulate relatively more assets, but they still have 39 percent fewer assets at ages 65 or 66 than their continuously married counterparts.

Table 9: Multivariate Regression Results of Log Total Wealth Comparing Continuously Married and Ever-divorced Individuals

	Women			Men		
	(1)	(2)	(3)	(1)	(2)	(3)
Ever Divorced	-0.224***	-0.447***	-0.614**	-0.225***	-0.150*	-0.176
	(0.0702)	(0.111)	(0.262)	(0.0610)	(0.0887)	(0.374)
[Marginal effect of ever being divorced]	[-20%]	[-36%]	[-39%]	[-20%]	[-14%]	[-15%]
Currently Divorced	-1.437***	-1.146***	-2.687***	-1.132***	-1.015***	-1.788***
	(0.0953)	(0.145)	(0.384)	(0.102)	(0.143)	(0.495)
[Cumulative marginal effect of ever and currently being divorced]	[-81%]	[-80%]	[-83%]	[-74%]	[-69%]	[-68%]
Children (baseline: 2-3 kids)						
Indicator for 0 kids		-0.203	-0.201		0.0833	0.0718
		(0.191)	(0.190)		(0.164)	(0.163)
Indicator for 1 kids		-0.219	-0.219		-0.0447	-0.0244
		(0.142)	(0.141)		(0.117)	(0.116)
Indicator for 4+ kids		-0.339***	-0.328***		-0.274***	-0.272***
		(0.0756)	(0.0754)		(0.0681)	(0.0675)
ln(Total years worked)			0.0502			0.263***
			(0.0334)			(0.0659)
Ever Divorced						
x with 0 kids		0.306	0.303		-0.571**	-0.440*
		(0.348)	(0.346)		(0.257)	(0.258)
x with 1 kids		0.482*	0.477*		-0.0644	-0.0670
		(0.270)	(0.269)		(0.241)	(0.239)
x with 4+ kids		0.272**	0.258*		-0.0275	-0.00880
		(0.137)	(0.137)		(0.118)	(0.117)
x with ln(Total years worked)			0.0405			0.00396
			(0.0718)			(0.0981)
Currently Divorced						
x with 0 kids		0.255	0.152		0.556	0.431
		(0.411)	(0.409)		(0.371)	(0.368)
x with 1 kids		-0.517	-0.426		-0.406	-0.393
		(0.325)	(0.323)		(0.320)	(0.317)
x with 4+ kids		-0.338*	-0.223		-0.267	-0.266
		(0.189)	(0.190)		(0.202)	(0.200)
x with ln(Total years worked)			0.451***			0.222*
			(0.105)			(0.131)
Observations	4,275	4,271	4,271	3,945	3,942	3,942
R-squared	0.132	0.332	0.342	0.074	0.312	0.325

Notes: Unweighted log total wealth in 1000s of 2014 dollars for specific women and men aged 65 or 66 in the HRS surveys (1992-2014). See notes to table 1 for a further description of the full sample and subsamples, and notes to table 3 for a description of what comprises total wealth. Model 1 is a regression log assets on the marital variables. Model 2 adds in covariates including interactions of marital status with children and race categories, as well as indicators for full-time work at 65, education, interview wave, and self-reported health. Model 3 adds log of the self-reported total years worked. Marginal values are calculated using the baseline group (e.g., never divorced, currently married, with 2-3 kids and average years worked). The sample sizes are smaller here then in table 2 because individuals without positive assets are excluded from the specification (395 women, and 203 men are excluded for this reason). Smaller sample sizes in models 2-3 are due to missing-ness in self-reported health.

The simple model in Section 4 demonstrated the theoretical importance of divorce timing in asset accumulation. Table 10 considers the same regression framework as Table 9, but focuses on a subsample that was married in their thirties, and considers the role of a divorce in that age

range on asset accumulation by age 65 or 66. Similar to Model 1 in Table 9, we find that both men and women who divorce in their thirties and do not remarry accumulate substantially fewer assets (78 percent for women, 69 percent for men) than their counterparts who are married throughout their thirties. This effect persists even if they remarry. The similar qualitative results in Tables 9 and 10 are not surprising, since divorce is more likely to occur younger in working life, so a larger fraction of the ever divorced population is likely to look more similar to a sample of individuals who could have divorced in their thirties than a sample of individuals who could have divorced in their fifties.

Controlling for the additional covariates in Model 2 (i.e., education, interview wave, retirement and health status and interactions with children and race – the same as Model 2 in Table 9), we find that divorce has persistent effects that are worse for women than men, even with remarriage. The results are qualitatively similar to those in Table 9.

Controlling for total years worked in Model 3 of Table 10, we observe that the coefficient on years worked is significant at the ten percent level for women. However, controlling for the interaction of years worked with divorce and remarriage, we find that divorced women with longer careers accumulate more assets (coefficient of 0.673), and that remarriage mitigates this relationship (coefficient of -0.369). This suggests that careers and remarriage could represent alternative paths for retirement security.

Table 10: Multivariate Regression Results of Log Total Wealth Comparing Individuals Divorcing in their Thirties to those Married in their Thirties

	Women			Men		
	(1)	(2)	(3)	(1)	(2)	(3)
Divorced in thirties	-1.494***	-1.851***	-4.183***	-1.135***	-0.849***	-4.005***
	(0.154)	(0.207)	(0.693)	(0.245)	(0.329)	(1.435)
[Marginal effect of divorcing in thirties]	[-78%]	[-85%]	[-86%]	[-69%]	[-59%]	[-52%]
Remarried after divorce in thirties	1.213***	1.323***	2.625***	0.750***	0.430	4.007***
	(0.177)	(0.248)	(0.799)	(0.254)	(0.347)	(1.518)
[Cumulative marginal effect of divorcing in thirties and later remarrying]	[-24%]	[-41%]	[-43%]	[-32%]	[-34%]	[-34%]
Children (baseline: 2-3 kids)						
Indicator for 0 kids		-0.349**	-0.350**		-0.123	-0.0853
		(0.162)	(0.161)		(0.153)	(0.152)
Indicator for 1 kids		-0.458***	-0.459***		-0.129	-0.111
		(0.116)	(0.115)		(0.103)	(0.102)
Indicator for 4+ kids		-0.368***	-0.364***		-0.298***	-0.290***
		(0.0628)	(0.0627)		(0.0572)	(0.0569)
ln(Total years worked)			0.0505*			0.317***
			(0.0295)			(0.0568)
Divorced in Thirties						
x with 0 kids		1.283***	1.107***		-0.493	0.963
		(0.420)	(0.422)		(0.898)	(1.013)
x with 1 kids		0.927*	1.073**		0.0210	0.0326
		(0.529)	(0.529)		(0.578)	(0.575)
x with 4+ kids		-0.0957	-0.110		-0.765	-0.684
		(0.320)	(0.319)		(0.524)	(0.522)
x with ln(Total years worked)			0.673***			0.873**
			(0.192)			(0.385)
Remarried after divorce in Thirties						
x with 0 kids		-0.640	-0.568		0.322	-1.134
		(0.555)	(0.556)		(0.933)	(1.045)
x with 1 kids		-0.161	-0.365		-0.239	-0.264
		(0.621)	(0.621)		(0.638)	(0.635)
x with 4+ kids		0.407	0.434		0.908*	0.816
		(0.362)	(0.361)		(0.541)	(0.539)
x with ln(Total years worked)			-0.369*			-0.985**
			(0.222)			(0.406)
Observations	3,897	3,893	3,893	3,564	3,562	3,562
R-squared	0.025	0.262	0.267	0.012	0.254	0.263

Notes: Unweighted log total wealth in 1000s of 2014 dollars for specific women and men aged 65 or 66 in the HRS surveys (1992-2014). See notes to table 1 for a further description of the full sample and subsamples, and notes to table 3 for a description of what comprises total wealth, and table 7 for a description of models 1-3. The sample in this table is restricted to individuals married in their thirties, and hence have the possibility of divorcing. The sample sizes are smaller here then in table 2 because individuals without positive assets are excluded and not everyone in the sample is married in their thirties. Smaller sample sizes in models 2-3 are due to missing-ness in self-reported health.

As discussed in our simple model in Section 4, divorce can be particularly challenging for individuals from households that specialize. The limited years remaining in the workforce diminish the returns from pursuing an education or a career. Table 11 focuses on a subsample that was married in their fifties, and considers the role of a divorce in that age range on asset accumulation by age 65 or 66. As done in the last two tables, we consider the implications of

divorce and remarriage. Similar to the previous tables, we find a negative association of divorce with asset accumulation by age 65 or 66, but the effect is smaller. This is likely due to much of the lifetime asset accumulation occurring prior to divorce. We again find that the cumulative effect of divorce and remarriage on assets is negative relative to the continuously married sample (-30 percent for women and -28 percent for men).

Controlling for the other factors in Model 2, we find that the cumulative effect of divorce in their fifties followed by remarriage is worse (-43 percent for women and -40 percent for men). Additionally, while we find that having children in general affects overall asset levels, the interactions of number of children and divorce or remarriage are not significantly different from zero. This is not surprising as children for this subsample are much older and hence independent, requiring less time commitment that could otherwise influence the divorcee's work and savings response.

In Model 3, controlling for total years worked has the same positive effect on asset accumulation as in the previous two tables. It suggests that work experience improves asset accumulation among divorced women, but it does not eliminate the negative relationship between divorce and asset accumulation by age 65 or 66.

Comparing the marginal results in Tables 10 and 11, we find that the negative effect on assets of divorce without remarriage is worse for women who divorce in their 30s (-86 percent compared to continuously married women) than for women who divorce in their 50s (-72 percent compared to continuously married women) whereas the negative effect on assets of divorce without remarriage is worse for men who divorce later in life than for men who divorce earlier in life (-52 percent in for men divorcing in their 30s compared to -64 percent for men divorcing in their 50s).

Table 11: Multivariate Regression Results of Log Total Wealth Comparing Individuals Divorcing in their Fifties to those Married in their Fifties

	Women			Men		
	(1)	(2)	(3)	(1)	(2)	(3)
Divorced in fifties	-0.921***	-1.138***	-2.880***	-1.233***	-1.098***	-2.850***
	(0.174)	(0.226)	(0.745)	(0.190)	(0.271)	(0.747)
[Marginal effect of divorcing in fifties]	[-61%]	[-69%]	[-72%]	[-71%]	[-68%]	[-64%]
Remarried after divorce in fifties	0.560**	0.580	-1.813	0.898***	0.586*	0.981
	(0.270)	(0.373)	(1.325)	(0.227)	(0.326)	(1.449)
[Cumulative marginal effect of divorcing in fifties and later remarrying]	[-30%]	[-43%]	[-67%]	[-28%]	[-40%]	[-42%]
Children (baseline: 2-3 kids)						
Indicator for 0 kids		-0.278*	-0.280*		-0.135	-0.112
		(0.150)	(0.150)		(0.127)	(0.126)
Indicator for 1 kids		-0.312***	-0.312***		-0.0839	-0.0737
		(0.115)	(0.114)		(0.0986)	(0.0980)
Indicator for 4+ kids		-0.356***	-0.354***		-0.305***	-0.297***
		(0.0604)	(0.0603)		(0.0537)	(0.0533)
ln(Total years worked)			0.0469			0.299***
			(0.0290)			(0.0520)
Divorced in Fifties						
x with 0 kids		-0.0292	-0.212		-1.211	-1.424*
		(0.750)	(0.751)		(0.772)	(0.768)
x with 1 kids		-0.377	-0.351		-0.805	-0.610
		(0.476)	(0.475)		(0.607)	(0.605)
x with 4+ kids		0.373	0.410		-0.420	-0.365
		(0.344)	(0.344)		(0.362)	(0.360)
x with ln(Total years worked)			0.519**			0.500***
			(0.213)			(0.194)
Remarried after divorce in Fifties						
x with 0 kids		--	--		1.050	1.395
		--	--		(1.074)	(1.072)
x with 1 kids		1.698	1.416		1.335	1.183
		(1.283)	(1.281)		(0.827)	(0.823)
x with 4+ kids		-0.172	0.126		0.561	0.536
		(0.516)	(0.521)		(0.429)	(0.427)
x with ln(Total years worked)			0.642*			-0.137
			(0.365)			(0.381)
Observations	3,664	3,661	3,661	3,673	3,670	3,670
R-squared	0.008	0.254	0.260	0.013	0.264	0.275

Notes: Unweighted log total wealth in 1000s of 2014 dollars for specific women and men aged 65 or 66 in the HRS surveys (1992-2014). See notes to table 1 for a further description of the full sample and subsamples, and notes to table 3 for a description of what comprises total wealth, and table 7 for a description of models 1-3. The sample in this table is restricted to individuals married in their fifties, and hence have the possibility of divorcing. The sample sizes are smaller here then in table 2 because individuals without positive assets are excluded and not everyone in the sample is married in their fifties. Smaller sample sizes in models 2-3 are due to missing-ness in self-reported health.

Tables 9 to 11 consider the relationship between divorce, remarriage, kids, and work length on total asset accumulation by age 65. Total assets include liquid and illiquid assets, wealth intended for retirement and wealth used for current housing and transportation needs. We also consider the role of divorce on liquid retirement assets, such as IRAs and 401(k)s. We find the same general pattern of results for these retirement assets (see Appendix A). We find that the negative effect on retirement assets of divorce without remarriage is worse for women who

divorce in their 30s than for women who divorce in their 50s whereas the negative effect on retirement assets of divorce without remarriage is worse for men who divorce later in life than for men who divorce earlier in life.

These findings bolster the theory presented in Section 4. Namely the timing of divorce relative to planned savings matters substantially for retirement security. Women divorcing at young ages have persistently less wealth at retirement ages relative to their continuously married or remarried peers. However, the multivariate regressions are associative and not causal. Households that do not remarry could differ in initial conditions that we cannot capture. Nevertheless, these results do indicate that women divorcing at young ages who do not remarry are more likely to have limited assets at retirement ages, raising the probability of being financially insecure in retirement.

How many assets are available in retirement is dependent upon how assets are divided and what type of assets each individual retains at separation. We consider division of assets at separation in the next subsection.

Division of assets following a separation

In this subsection, we address our second research question regarding how households divorcing after their first HRS interview choose to divide assets, particularly retirement assets, at separation.[12] Evaluating the division of assets requires observing assets before and after a divorce for each member of the original household. The HRS is a particularly good resource for evaluating the division of assets following a separation because the HRS attempts to follow both individuals after the separation, even if the divorce is not finalized. In the HRS, 432 households are observed separating or divorcing during their time in HRS. This is an underestimate, as both members of a household could choose not to participate in the HRS interviews after separation and, consequently, the HRS would never know that they separated. Of the 432 households that report a separation following their first HRS interview, there are 290 households where both members are interviewed in the interview wave immediately before and immediately after the separation. Of the households where one individual does not meet these criteria, 153 of the missing individuals are women and 131 are men. In Table 12, we evaluate the separation of assets, conditional on assets being positive before separation.[13] In the first row of Table 12, we

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[12] Recall from footnote 1 in the introduction that these are separations leading to divorce. See footnote 1 for why time of separation, as opposed to time of divorce, is used.

[13] We include only liquid assets and not Social Security or defined benefit wealth in our measure of assets. Individual Social Security wealth is, generally speaking, agnostic to divorce if individuals have been married for at least 10 years (at this point, divorced spouse and divorced survivor benefits provide benefits similar to the married equivalents). For private pension wealth, the impact of pension wealth loss due to a divorce is not well tracked. While there is a section that asks about lump-sum pension settlements at divorce, the questions in this section refer

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see that average household wealth is approximately $615,000 before separation. As asset distributions typically have a strong right skew, in the second row we present the median, which for separating household with non-zero assets is around $184,000. In the first interview wave after separation, average wealth for women is $203,000 (33 percent of pre-separation average assets), and median wealth is $84,000 (47 percent of pre-separation median assets). Alternatively, in the first interview wave after separation, average wealth for men is $315,000 (51 percent of pre-separation average assets), and median wealth is $98,000 (53 percent of pre-separation median assets).

We find that 13 percent of women report zero or negative total assets in the first interview wave after separation. Similarly, 14 percent of men report zero or negative total assets in the first interview wave after separation.

Table 12: Assets Before and After Separation by Gender

	Average household assets before separation (median below)	Wife's average assets post-separation (median below)	Husband's average assets post-separation (median below)	Percent of couples where wife ends up with 0% or less of pre-separation assets	Percent of couples where husband ends up with 0% or less of pre-separation assets	N
Total assets, Conditional on >0 household assets before separation	614,693	203,463	314,940	13%	14%	280
	184,372	83,673	97,536			
Retirement assets, Conditional on >0 retirement assets before separation	243,072	58,330	129,754	34%	30%	175
	65,531	9,212	23,961			
Housing assets, Conditional on >0 housing assets before separation	156,061	75,696	85,429	41%	42%	246
	93,943	31,240	21,306			

Note: Table reflects households separating after initial HRS interview where both individuals are observed in the first interview wave after separation. Total, retirement, and housing assets are defined as in tables 3 and 5.

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to receipt of payments and not the implications for reduction in expected pension payments. Consequently, we focus on assets outside of annuitized wealth available before and after the separation.

Since retirement assets and housing wealth represent an important source of wealth for many households, we next consider the implications of separation on the division of these assets.[14] For retirement assets, our asset measures reflect the reported balances of IRAs and defined contribution retirement accounts. Moreover, we condition our measures on the household having positive retirement assets before separation. In the third row of Table 12, we find that average household retirement assets are approximately $243,000 before separation. The median for a separating household with non-zero assets is around $66,000. In the first interview wave after separation, average retirement assets for women are $58,000 (24 percent of pre-separation average assets), and median wealth is only $9,000 (14 percent of pre-separation median assets). In the first interview wave after separation, average retirement assets for men are $130,000 (53 percent of pre-separation average assets), and median wealth is $24,000 (36 percent of pre-separation median assets). The substantial reduction in average and median wealth may reflect substantial heterogeneity in the division and movement of assets. For example, the shifting of assets out of retirement accounts could result in the pattern we observe.

One method for dividing assets would be equal division of each asset, which could require the liquidation of an asset. An alternative method would be to trade assets. For example, one spouse might choose to exchange a home for the other spouse's claim on his or her retirement account. We find evidence that retirement accounts are swapped or liquidated instead of divided as part of the asset division. Of the couples with positive retirement assets before the separation, 34 percent of women and 30 percent of men end up with no measured retirement assets after separation. For about 13 percent of these households, neither spouse has positive retirement assets after separation (not shown in table).

For housing assets, our asset measure reflects the reported net value of the household's primary residence. We condition our measure on the household having positive net housing assets before separation. In the fifth row of Table 12, we find that average household housing assets are approximately $156,000 before separation. The median housing asset for a separating household with non-zero assets is around $94,000. In the first interview wave after separation, average housing assets for women are $76,000 (49 percent of pre-separation average assets), and median wealth is only $31,000 (33 percent of pre-separation median assets). Alternatively, in the first interview wave after separation, average net housing wealth for men is $85,000 (54 percent of pre-separation average assets), and median wealth is $21,000 (22 percent of pre-separation median assets).

We find evidence that housing wealth is swapped or liquidated instead of divided as part of the asset division. Of the couples with positive housing wealth before the separation, 41 percent

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[14] Again, we do not include private pension wealth or SS retirement wealth in this analysis. We will consider the implications of divorce of receipt of annuity payments in the next chapter.

of women and 42 percent of men end up with zero or negative assets after separation. For about 14 percent of these households, neither spouse has positive housing wealth after separation.

Apparently unequal asset division - where one member of the household has no post-separation assets - may be explained in part by certain pre-separation characteristics. For example, households with fewer assets may be more likely to have one member observed with no assets by the first interview after separation. Individuals with full-time jobs are able to work and rebuild assets, making them less likely to have no assets. Additionally, as discussed in Section 3, local divorce laws may influence how assets are accumulated. Appendix B presents tables following a pattern similar to Table 12. These tables consider differences in post-separation assets by the existence of community property laws, pre-separation assets, and pre-divorce work status. These tables demonstrate that on average, assets in community property states are more evenly distributed – after separation women have 43 percent the total assets as before the separation in community property states, where women in equitable distribution states have only 31 percent of their pre-separation assets after divorce. This pattern, however, is reversed at the median, where assets are more evenly split in equitable distribution states than in community property states. Women in community property states are more likely to have non-positive retirement or housing assets after separation. For example 38 percent of women in equitable distribution states have no housing wealth after separation (conditional on having housing assets before the separation). In community property states, 53 percent of women have non-positive housing wealth after separation.

Further descriptive analysis reveals that pre-separation work status is associated with having greater assets after separation, highlighting the important role of work in retaining and accumulating savings after separation. Finally, the level of total asset change (the sum of ex-husbands and wives' average assets after separation relative to average household assets before separation) is generally positive for households in the bottom three-quarters of the pre-separation asset distribution. This suggests that for the strong majority of separating couples, combined savings grow following divorce. Additionally, the fraction having non-positive retirement or housing wealth is most common in the bottom half of the distribution, although these rates remain high (above 20 percent for both ex-husbands and wives) even in the top quarter of the pre-separation asset distribution.

The high rates of non-positive retirement assets or housing wealth after separation for both men and women are notable. As many of the explanatory factors described above are related, we control for these interrelationships by estimating probit regressions for whether the wife or husband has non-positive assets after separation. In addition to controlling for pre-separation assets, work, and state law, we also account for the number of dependents, age of each household member, and marriage length. These results are reported in Table 13. The husband's work status is a significant factor that mitigates the likelihood of either household member having non-positive total assets. For women but not men, greater pre-separation assets mitigate the likelihood of having non-positive total assets. For retirement wealth, if both members of the

separating couple are working, then the wife is less likely to have zero retirement assets. Only the husband's work status is associated with reducing a husband's probability of having zero retirement assets after separation. Women working full-time and living in an equitable distribution state reduce the wife's probability of having non-positive housing assets after separation. This is the only case where living in a community property state during the last interview prior to separation is significantly associated with any indication of asset swapping. For men, only the initial level of housing wealth is associated reducing the probability of having non-positive housing assets after separation.

Table 13: Multivariate Regression Results of Asset Division Outcomes Based on Pre-Separation Characteristics

VARIABLES	Indicator for wife having non-positive total assets after separation	Indicator for husband having non-positive total assets after separation	Indicator for wife having non-positive retirement assets after separation	Indicator for husband having non-positive retirement assets after separation	Indicator for wife having non-positive housing wealth after separation	Indicator for husband having non-positive housing wealth after separation
Wife works full-time	-0.414	-0.345	-0.106	0.179	-0.556**	0.211
	(0.341)	(0.307)	(0.356)	(0.345)	(0.280)	(0.268)
Husband works full-time	-0.734**	-0.531*	0.503	-0.639*	-0.0393	-0.234
	(0.337)	(0.297)	(0.343)	(0.354)	(0.254)	(0.258)
Both work full-time	0.564	0.0904	-1.022**	-0.264	0.456	-0.275
	(0.469)	(0.417)	(0.445)	(0.438)	(0.360)	(0.351)
Community property state	0.0372	-0.228	0.281	-0.111	0.427**	-0.118
	(0.273)	(0.254)	(0.242)	(0.246)	(0.206)	(0.210)
Total assets (by type) before sep.	-2.78e-06***	-7.07e-08	-1.25e-07	-3.52e-07	-1.89e-07	-1.43e-06***
	(8.88e-07)	(1.25e-07)	(1.96e-07)	(3.87e-07)	(4.67e-07)	(5.39e-07)
Observations	280	280	175	175	246	246
Pseudo R-squared	0.181	0.0798	0.128	0.0742	0.0430	0.0427

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Probit regressions of households separating after initial HRS interview where both individuals are observed in the first interview wave after separation. Factors included in the regression model, but not in the table are the number of dependents, age of each household member, and marriage length.

There are several interesting takeaways from the observed division of assets in the HRS. First, total asset division is close to equal at the median. Uneven distribution of assets is more prevalent for households with greater wealth. Second, there is significant retirement asset loss between the interview before separation and after the separation. The high rate of non-positive assets exists for both men (30 percent) and women (34 percent). With 13 percent of households where both men and women have non-positive assets, this implies that 51 percent of households end up with at least one member having non-positive retirement wealth. For housing wealth, this number is higher: 69 percent. These results suggest that separating households engage in substantial swapping or liquidation of assets at separation. Third, we find limited evidence that, after controlling for related factors, that divorce law has a substantive impact on asset division. Only in the case of housing wealth did we find that community property laws were associated with women being more likely to have non-positive wealth. This could be the result of housing – an indivisible asset - being used as a means of facilitating asset division for households by exploiting the home's equity.

Decumulation of Assets in Retirement

In this subsection we address our third research question: how do individuals who divorce after 50 differ from continually married households in their retirement decumulation behavior, including Social Security claiming patterns? To examine the impact of separation leading to a divorce on decumulation behavior we use a quasi-experimental approach known as propensity score matching. Table 7 considered differences in decumulation behavior for the continuously married relative to the ever divorced. We observed that the ever divorced were more likely to cash out or annuitize a DB or DC retirement plan compared to the ever divorced. Additionally, we observed that ever-divorced women were more likely to not have claimed Social Security benefits by the age of 65 or 66. The delay in Social Security benefit claiming could be the result of continued work required because of the divorce or because women who work have more outside options are therefore more likely to divorce in the first place.

A common criticism of divorce analyses is that the choice of a household to separate is endogenous, and so it is difficult to determine if the separation caused a difference in an outcome, or if the outcome was associated with another factor that happens to be correlated with divorce. The ideal analysis would compare the outcomes of a household that divorced to the same household had it not divorced. As this type of experiment is not possible, a quasi-experimental approach is required.

In order to approximate the random assignment of an experiment, we use propensity score matching. As part of this method, we estimate a probit model of separating after the first interview based on characteristics of a household before the separation. Following a procedure similar to Heckman and Smith (1999), we consider a number of specifications for predicting separation following the first HRS interview. After significant testing, we settled on a

specification for predicting the likelihood of divorce that included full-time work status for each person, joint full-time work status, an indicator for Catholicism, indicators for educational achievement by person (less than high school, high school or equivalent, some college, college), a linear spline in marriage length, number of dependents, an indicator for the first interview wave, and an indicator for ever having an IRA. Furthermore, when estimating each probit model, we restricted the sample to the applicable group. For example, for individuals who cash out, withdraw, and annuitize an IRA, we estimated our probit model only on households that had an IRA prior to separation and use the model to predict a propensity of divorce. In this example, for women, the average predicted probability of divorce was 0.031, and 85 percent of those who will divorce exceed this value, whereas only 39 percent of the continuously married exceed 0.031. For men, the prediction is stronger, 88 percent of those who will divorce exceed the average predicted probability of divorce, whereas only 34 percent of the continuously married exceed this average. This highlights the overlap issue – in order to determine the effect of divorce, the comparison group should be reflective of those who do divorce. By restricting our sample to individuals who "look like" those who eventually separate, we are creating an artificial control group based on observed characteristics. Across all the results in this subsection, the range for those who will divorce exceeding the mean of the predicted average divorce rate ranges from 77 to 88 percent, while the range for the continuously married is 34 to 56 percent.

Using these estimated probabilities, also known as propensity scores, we calculate the difference between the individuals that divorce and their four nearest neighbors, as judged by their relative closeness in terms of propensity score. We conduct this analysis both at the first interview wave (when everyone in the sample is married) and at retirement age. Propensity score matching controls for observable differences between those who divorce relative to remaining continuously married, however, unobserved differences might remain. Heckman et al. (1998) demonstrate that selection bias based on permanent unobserved differences between the treatment and control groups can be reduced by differencing results with the pretreatment differences. We produce these results as well, and test whether they are statistically different from zero. The resulting difference estimate is an average treatment effect on the treated, i.e. the impact of separation on the outcome of interest.

In Table 14, we report the estimated impact of separation on the probability of receiving Social Security retirement benefits by age X where X is ages 62/63, 65/66, and 70/71. In the first three rows of the table, we present the matched comparison between a divorcing individuals and similar but continuously married individuals at the first interview wave (before the separation). If there is no systematic difference between the divorcing and continuously married individuals, then the coefficient will be close to zero. Likewise, the next three rows compare this difference, but at age X, which could be 62/63, 65/66, or 70/71. The sample composition may change by age group, as not all HRS cohorts will have reached age 70/71 by the last interview wave, and attrition is cumulative, meaning that fewer people will continue with the HRS interview either because of death or nonparticipation. We find that there is no significant difference in men's

claiming behavior at ages 62/63 or 65/66, but that men are 4 percentage points more like to have claiming by age 70/71 if they separated. For women, the results are more stark: women are 8 percentage points less likely to begin collecting their retirement benefit at age 62/63 if they separate and 10 percentage points less likely at age 65/66. There is no significant difference in claiming behavior by age 70/71.

This difference is computed in the last three rows of Table 14. For example, in Table 14, at the first interview wave we observe for our age 70/71 group that men in the treatment group are 5 percentage points less likely to have claimed their Social Security retirement benefit in the first interview wave. By controlling for this initial difference, the behavioral impact of separation on claiming by age 70/71 is expanded to 9 percentage points. For the other categories of men and women's Social Security retirement benefit claiming, this method has less corrective impact.

Continued work may contribute to the delayed Social Security benefit claiming for women. Knapp (2014) demonstrated that divorcing women return to the labor force following their separation, and Couch et al. (2013) finds a similar result for women divorcing between ages 22 and 36. Repeating the analysis in Table 14, but with full-time work as the outcome of interest confirms work at ages 62/63 is 11.6 percentage points greater for separating women. The estimated rate of full-time work for separated women at ages 65/66 and 70/71 remains greater compared to observationally equivalent, continuously married women. These results are included in Appendix C.

Table 14: Propensity Score Matching Estimates for Social Security Retirement Claiming by Age 62/63, 65/66, and 70/71

		Men			Women		
		Age 62/63	Age 65/66	Age 70/71	Age 62/63	Age 65/66	Age 70/71
First Interview Wave	Coefficient	0.00	0.00	-0.05***	0.00	-0.01	0.00
	Standard Errors	0.00	0.01	0.02	0.01	0.01	0.02
	Z statistic	0.00	0.00	-2.44	0.31	-0.80	-0.15
Age X	Coefficient	-0.03	-0.04	0.04**	-0.08**	-0.10***	0.00
	Standard Errors	0.04	0.04	0.02	0.04	0.04	0.02
	Z statistic	-0.79	-0.91	2.25	-2.18	-2.64	-0.14
Difference	Coefficient	-0.03	-0.04	0.09***	-0.08**	-0.09**	0.00
	Standard Errors	0.04	0.04	0.03	0.04	0.04	0.02
	Z statistic	-0.79	-0.88	3.16	-2.21	-2.29	0.00

Notes: *** p<0.01, ** p<0.05, * p<0.1. Propensity score matching technique uses a probit model to predict the probability of separating after the first HRS interview. The four nearest neighbors are used to calculate the average treatment effect on the treated.

Table 15 considers the impact of separation on drawing income from a DB pension. While descriptively, ever-divorced individuals are slightly less likely to receive DB pension income, the results of the difference analysis suggests that individuals separated are no more likely to draw

DB pension income than like households that are continuously married. This is true at each of the three ages we consider, as well as for both genders.

Table 15: Propensity Score Matching Estimates for DB Receipt by Ages 62/63, 65/66, and 70/71

		Men			Women		
		Age 62/63	Age 65/66	Age 70/71	Age 62/63	Age 65/66	Age 70/71
First Interview Wave	Coefficient	-0.03	0.01	0.00	-0.02***	-0.05***	-0.07***
	Standard Errors	0.03	0.03	0.04	0.01	0.01	0.02
	Z statistic	-0.99	0.50	0.00	-2.38	-3.37	-3.20
Age X	Coefficient	0.00	-0.02	-0.02	-0.02	-0.04	-0.05
	Standard Errors	0.05	0.05	0.05	0.05	0.05	0.06
	Z statistic	0.05	-0.47	-0.44	-0.41	-0.89	-0.81
Difference	Coefficient	0.03	-0.04	-0.02	-0.002	0.00	0.03
	Standard Errors	0.05	0.05	0.07	0.05	0.05	0.06
	Z statistic	0.57	-0.73	-0.31	-0.05	0.06	0.44

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Conditional on being reporting having a DB plan at a current or past job. Propensity score matching technique uses a probit model to predict the probability of separating after the first HRS interview. The four nearest neighbors are used to calculate the average treatment effect on the treated.

Table 16 considers the impact of separation on DB/DC cash-out. While descriptively ever divorced individuals appear more likely to cash-out their DB/DC pensions, the results of the difference analysis suggests that individuals separated are no more likely to cash out their pension than like households that are continuously married. This is true at each of the three ages we consider, as well as for both genders.

Table 16: Propensity Score Matching Estimates for DB/DC Cash-out by Ages 62/63, 65/66, and 70/71

		Men			Women		
		Age 62/63	Age 65/66	Age 70/71	Age 62/63	Age 65/66	Age 70/71
First Interview Wave	Coefficient	0.03	0.03	0.01	0.07	-0.03	0.03
	Standard Errors	0.04	0.04	0.04	0.04	0.04	0.05
	Z statistic	0.88	0.88	0.27	1.74	-0.72	0.58
Age X	Coefficient	0.00	0.02	-0.01	0.02	-0.03	0.01
	Standard Errors	0.04	0.04	0.06	0.05	0.05	0.06
	Z statistic	0.05	0.37	-0.16	0.50	-0.60	0.13
Difference	Coefficient	-0.03	-0.02	-0.02	-0.041	0.00	-0.02
	Standard Errors	0.03	0.03	0.04	0.03	0.04	0.05
	Z statistic	-1.16	-0.56	-0.57	-1.39	-0.12	-0.41

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Conditional on being reporting having a DB or DC plan at a current or past job. Propensity score matching technique uses a probit model to predict the probability of separating after the first HRS interview. The four nearest neighbors are used to calculate the average treatment effect on the treated.

Finally, Table 17 considers IRA decumulation in response to a separation. Across all age groups, separating men are more likely to decumulate their IRA accounts. However, men who go on to separate were also more likely to decumulate their accounts before separation, as demonstrated by the positive coefficient in the first interview wave. After accounting for this permanent difference, only decumulation behavior of men by ages 70/71 is statistically significant. A potential explanation for this is that separated men may no longer be concerned with providing benefits to a survivor, and hence decumulate these accounts faster.

Table 17: Propensity Score Matching Estimates for IRA Cash-out, Annuitization, or Withdrawal by Ages 62/63, 65/66, and 70/71

		Men			Women		
		Age 62/63	Age 65/66	Age 70/71	Age 62/63	Age 65/66	Age 70/71
First Interview Wave	Coefficient	0.04*	0.04	0.04*	0.00	0.01	-0.01
	Standard Errors	0.02	0.03	0.02	0.02	0.02	0.01
	Z statistic	1.78	1.61	1.80	0.00	0.52	-1.25
Age X	Coefficient	0.12**	0.10**	0.15***	-0.05	-0.01	-0.11*
	Standard Errors	0.06	0.06	0.01	0.06	0.05	0.07
	Z statistic	2.01	1.73	13.43	-0.76	-0.17	-1.68
Difference	Coefficient	0.07	0.06	0.11***	-0.049	-0.02	-0.10
	Standard Errors	0.06	0.06	0.02	0.06	0.05	0.07
	Z statistic	1.23	1.00	6.52	-0.75	-0.42	-1.44

Notes: *** p<0.01, ** p<0.05, * p<0.1. Conditional on being reporting having an IRA currently or in the past. Propensity score matching technique uses a probit model to predict the probability of separating after the first HRS interview. The four nearest neighbors are used to calculate the average treatment effect on the treated.

Our propensity score matching analysis has revealed that separation at late ages encourages delayed Social Security claiming behavior for women. For women aged 62/63, they are 8 percentage points less likely to claim their Social Security benefit. Since 41 percent of married women claim their benefit by this age, the 8-percentage point reduction can also be interpreted as a 20 percent reduction in claiming at the earliest claiming age. Our analysis also suggest that separation has no statistically significant impact on DB/DC decumulation, but we do find elevated rates of IRA decumulation among separated men at older ages.

7. Conclusion

This report represents an important step in understanding how retirement security is impacted by divorce, and if it has differential effects based on gender, work history, the timing of divorce and other observable differences within the household. We introduced a simple theory that indicates in the case of a divorce that (1) household specialization places the household member with lower potential earnings at greater risk for retirement insecurity, and (2) the timing of divorce relative to planned retirement savings can negatively affect retirement security. Our findings are consistent with the theory.

Similar to previous research on divorce and retirement wealth, our analyses all demonstrate that having been divorced is associated with lower retirement assets and lower household assets at ages 65 and older when compared to those who have been continuously married. We find that women - the most likely to specialize in non-labor market work - are the most negatively

impacted by divorce, and that this association persists until retirement. Additionally, our results suggest that extended careers and remarriage are important behavioral responses that mitigate the negative relationship between divorce and asset accumulation by 65.

To investigate the impact of timing of divorce, we compare those individuals who divorced later in working life with those individuals who divorce early on. In particular, we examined two groups: those divorcing in their thirties and those divorcing in their fifties. The descriptive analysis finds that, generally, those who divorce in their fifties have less wealth at age 65 than those who divorce in their thirties, but there are important differences by current marital status and labor force status. Indeed, the multivariate regressions control for current marital status and work history and finds more nuanced results. For example, for women who divorced in their thirties, divorce has persistent negative effects, that while mitigated by remarriage, are still persistently lower at ages 65 or 66 compared to continuously married households. The negative association is larger for women with more children. Women who divorced in their fifties also accumulate fewer assets compared to continuously married women, but this reduction in assets is smaller than for women who divorced earlier in life. For men, there is a negative association of divorce with asset accumulation, but it is smaller than that experienced for divorcing women.

Wealth at older ages for divorced individuals is dependent upon how assets are divided and what type of assets each individual retains at separation. We document how households divorcing after their first interview in the HRS divide assets. We find evidence of significant swapping and liquidation of retirement and housing assets: 51 percent of households with pre-separation retirement wealth will have at least one household member with zero liquid retirement assets after separation.

We also consider the impact of divorce on retirement decumulation. Descriptive analysis finds that men who have ever been divorced are less likely to be currently receiving DB or annuity income at each age group, compared with men who are continuously married. Women who have ever been divorced are less likely to be collecting Social Security benefits at ages 65 and 66 than continuously married women. However, descriptive comparisons like these conceal the great deal of variation in personal characteristics that could influence both asset accumulation and decumulation behavior between the age at separation and retirement age. We also examine decumulation behavior using a matching analysis that links an individual who is married at the first HRS interview but eventually divorces to similar individuals who do not divorce. This propensity score matching analysis controls for observed differences between the average divorcee and the average continuously married person. Following Heckman et al. (1998), we adapt the typical propensity score matching analysis to also control for permanent unobserved characteristics by controlling for pre-separation differences between individuals that go onto divorce and their continuously married counterparts. We find no significant evidence that divorce is persistently associated with measures of liquid retirement asset decumulation after controlling for these differences. We find that separated women are more likely to delay Social Security retirement benefit claiming until age 65 or 66.

The HRS's rich set of longitudinal data and retrospective marital and work histories allow us to contrast how retirement outcomes differ by age at divorce and, particularly, differences in outcomes by whether these individuals remarried and whether they were working before their divorce. The time period covered by the HRS represents a unique opportunity to follow the retirement wealth accumulation of households as they approach retirement.

However, there are some important limitations of our analyses. In our analysis of how divorcing households divide assets, it is important to note that the HRS interviews occur every two years and are independent of the household separation. Therefore the time between interview and separation may vary across individuals. Also, because the interview is not conducted directly after assets are divided, individuals may have already started taking actions to improve their own financial position, resulting in an aggregate growth of assets.

We believe that these limitations are outweighed by the analyses that this survey affords: the opportunity to see individual asset accumulation by retirement age, variation in marital histories, and for household divorcing within the HRS, characteristics and accumulated wealth before divorce, as well as wealth accumulation after divorce and at retirement age. This last advantage is unique to the HRS, and it particularly important for developing a reasonable comparison group that is necessary for counterfactual analysis.

The growing trend of near-retirement divorce has important implications for retirement security and decumulation, particularly for women. Over half of women who divorce in their 50s have zero retirement wealth at age 65 or 66. Remarriage or working longer mitigate the wealth loss from divorce, but individuals in their 50s have a short time horizon to accumulate assets for retirement.

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Appendix A: Multivariate Analyses of Retirement Assets

In this appendix, we consider the relationship between divorce, remarriage, kids, and work length on liquid retirement asset accumulation by age 65. We focus on liquid retirement assets, because they are easy for an individual to value by observing account balances. Liquid retirement accounts, while available to anyone, are not always used as the predominant means of saving, despite their tax advantage. There may be barriers to individuals choosing to use these accounts, some of which include lack of financial understanding or plan complexity, tax-penalties for early withdrawal, and employers not sponsoring a plan or the individual is not employed. Our multivariate analysis will focus on the subsample of individuals with a non-zero balance in their plan, which is 49.9 percent of women and 58.9 percent of men.[15]

In Table 18, Model 1 evaluates the relationship between ever being divorced, currently being divorced, and retirement assets. Similar to the relationship with total assets, retirement savings are lower for the ever divorced (-23 percent for women, -8 percent for men) relative to the continuously married, and are substantively lower for those divorcees who are currently divorced at age 65 or 66. Also similar to the model with total assets, adding in the additional covariates, included interactions of the divorce variables with number of children, reveals a more negative relationship between ever being divorced and retirement assets for women but not for men. In Model 3, accounting for years worked also yields a negative impact of divorce for women and men.

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[15] It is also possible that individuals could have annuitized their IRAs or DC accounts by age 65 or 66, and that information would be missing from these tables.

Table 18: Multivariate Regression Results of Log Retirement Wealth Comparing Continuously Married and Ever-divorced Individuals

	Women			Men		
	(1)	(2)	(3)	(1)	(2)	(3)
Ever Divorced	-0.255***	-0.367***	-0.589	-0.0782	-0.0246	-0.315
	(0.0837)	(0.133)	(0.424)	(0.0765)	(0.113)	(0.779)
[Marginal effect of ever being divorced]	[-23%]	[-31%]	[-30%]	[-8%]	[-3%]	[-3%]
Currently Divorced	-0.659***	-0.601***	-0.716	-0.562***	-0.669***	-3.574**
	(0.121)	(0.181)	(0.856)	(0.153)	(0.209)	(1.785)
[Cumulative marginal effect of ever and currently being divorced]	[-60%]	[-62%]	[-62%]	[-47%]	[-50%]	[-50%]
Children (baseline: 2-3 kids)						
Indicator for 0 kids		0.104	0.105		0.415*	0.437**
		(0.215)	(0.215)		(0.221)	(0.221)
Indicator for 1 kids		-0.0325	-0.0181		-0.105	-0.0871
		(0.170)	(0.170)		(0.153)	(0.153)
Indicator for 4+ kids		-0.179*	-0.192**		-0.283***	-0.281***
		(0.0915)	(0.0917)		(0.0939)	(0.0937)
ln(Total years worked)			-0.0991**			0.261**
			(0.0466)			(0.111)
Ever Divorced						
x with 0 kids		0.240	0.232		-0.364	-0.325
		(0.528)	(0.529)		(0.359)	(0.360)
x with 1 kids		0.372	0.355		0.0104	0.0321
		(0.338)	(0.339)		(0.306)	(0.306)
x with 4+ kids		0.209	0.226		0.112	0.109
		(0.173)	(0.173)		(0.160)	(0.159)
x with ln(Total years worked)			0.0695			0.0772
			(0.118)			(0.205)
Currently Divorced						
x with 0 kids		-0.599	-0.595		-0.0238	-0.0281
		(0.566)	(0.568)		(0.577)	(0.577)
x with 1 kids		-0.429	-0.429		0.334	0.324
		(0.424)	(0.424)		(0.497)	(0.496)
x with 4+ kids		-0.231	-0.227		-0.302	-0.271
		(0.271)	(0.271)		(0.358)	(0.357)
x with ln(Total years worked)			0.0337			0.781
			(0.238)			(0.475)
			0.0409			0.387
Observations	2,326	2,325	2,325	2,439	2,438	2,438
R-squared	0.047	0.171	0.173	0.009	0.141	0.147

Notes: Unweighted log retirement wealth in 1000s of 2014 dollars for specific women and men aged 65 or 66 in the HRS surveys (1992-2014). See notes to table 1 for a further description of the full sample and subsamples, and notes to table 4 for a description of what comprises retirement wealth. Model 1 is a regression of log assets on the marital variables. Model 2 adds in covariates including interactions of marital status with children and race categories, as well as indicators for full-time work at 65, education, interview wave, and self-reported health. Model 3 adds log of the self-reported total years worked. Marginal values are calculated using the baseline group (e.g., never divorced, currently married, with 2-3 kids and average years worked). The sample sizes are smaller here then in table 7 because individuals without positive retirement assets are excluded from the specification (2,541 women, and 1,878 men are excluded for this reason). Smaller sample sizes in models 2-3 are due to missing-ness in self-reported health.

The multivariate regression results of the relationship between retirement assets, divorce in the thirties and remarriage (Table 19) are qualitatively similar to multivariate regression results of the relationship between retirement assets, ever being divorced, and currently being divorced in Table 18.

Both men and women who divorce in their thirties and do not remarry accumulate fewer assets (57 percent for women, 46 percent for men) than their counterparts who are continuously married according to Model 1. This effect persists even if they remarry, and incorporating interactions with children and other covariates in Model 2 does not substantively change this result. Controlling for the interaction of years worked with divorce and remarriage in Model 3, we find that divorced women with longer careers accumulate more assets (coefficient of 0.297), and that remarriage mitigates this relationship (coefficient of -0.150), but these results are not significantly different from zero. The results for men in Table 19 are not statistically significant, but their direction is broadly consistent with the model of total assets in Table 10.

Interestingly, there is a small negative relationship between total years worked and retirement assets for women that suggests a 12 percent increase in years worked is associated with one percent less in household retirement assets (completely aside from divorce). This relationship may be reflecting the selected subsample of women in household with positive retirement assets. The longer working life could be capturing households with lower overall incomes where both spouses need to work.

Table 19: Multivariate Regression Results of Log Retirement Wealth Comparing Individuals Divorcing in their Thirties to those Married in their Thirties

	Women			Men		
	(1)	(2)	(3)	(1)	(2)	(3)
Divorced in thirties	-0.832***	-0.962***	-2.007	-0.548	-0.322	-1.550
	(0.208)	(0.295)	(1.492)	(0.363)	(0.506)	(3.178)
[Marginal effect of divorcing in thirties]	[-57%]	[-63%]	[-65%]	[-46%]	[-36%]	[-21%]
Remarried after divorce in thirties	0.569**	0.376	0.929	0.441	0.0311	0.966
	(0.231)	(0.339)	(1.662)	(0.374)	(0.526)	(3.353)
[Cumulative marginal effect of divorcing in thirties and later remarrying]	[-23%]	[-44%]	[-45%]	[-10%]	[-25%]	[-25%]
Children (baseline: 2-3 kids)						
Indicator for 0 kids		-0.210	-0.195		0.174	0.197
		(0.193)	(0.193)		(0.210)	(0.210)
Indicator for 1 kids		-0.259*	-0.243*		-0.123	-0.108
		(0.142)	(0.142)		(0.139)	(0.139)
Indicator for 4+ kids		-0.159**	-0.166**		-0.270***	-0.268***
		(0.0779)	(0.0779)		(0.0804)	(0.0803)
ln(Total years worked)			-0.115***			0.242**
			(0.0429)			(0.104)
Divorced in Thirties						
x with 0 kids		0.0682	0.0510		-1.514	-1.526
		(0.571)	(0.571)		(1.230)	(1.229)
x with 1 kids		0.00618	0.0645		-0.765	-0.724
		(0.656)	(0.680)		(0.847)	(0.848)
x with 4+ kids		-0.0418	-0.0327		0.535	0.574
		(0.512)	(0.512)		(1.154)	(1.155)
x with ln(Total years worked)			0.297			0.351
			(0.403)			(0.877)
Remarried after divorce in Thirties						
x with 0 kids		0.524	0.513		1.469	1.492
		(0.760)	(0.760)		(1.277)	(1.277)
x with 1 kids		0.954	0.875		1.556*	1.546*
		(0.757)	(0.778)		(0.929)	(0.931)
x with 4+ kids		0.442	0.452		-0.187	-0.233
		(0.552)	(0.552)		(1.168)	(1.169)
x with ln(Total years worked)			-0.150			-0.272
			(0.451)			(0.921)
Observations	2,163	2,162	2,162	2,263	2,262	2,262
R-squared	0.009	0.136	0.139	0.001	0.128	0.131

Notes: Unweighted log retirement wealth in 1000s of 2014 dollars for specific women and men aged 65 or 66 in the HRS surveys (1992-2014). See notes to table 1 for a further description of the full sample and subsamples, and notes to table 4 for a description of what comprises retirement wealth, and table 10 for a description of models 1-3. The sample in this table is restricted to individuals married in their thirties, and hence have the possibility of divorcing. The sample sizes are smaller here then in table 8 because individuals without positive assets are excluded and not everyone in the sample is married in their thirties. Smaller sample sizes in models 2-3 are due to missing-ness in self-reported health.

Table 20 considers the same multivariate regression framework relating retirement assets to divorce and remarriage experience, but focuses on a sample of individuals who divorce in their fifties. Similar to the previous tables, we find a negative association of divorce with asset accumulation by age 65 or 66. As in Table 11, this is likely due to much of the lifetime asset accumulation occurring prior to divorce.

Table 20: Multivariate Regression Results of Log Retirement Wealth Comparing Individuals Divorcing in their Fifties to those Married in their Fifties

	Women			Men		
	(1)	(2)	(3)	(1)	(2)	(3)
Divorced in fifties	-0.418*	-0.492*	-1.801	-0.611*	-0.699	5.459
	(0.222)	(0.291)	(1.917)	(0.321)	(0.476)	(7.864)
[Marginal effect of divorcing in fifties]	[-36%]	[-41%]	[-43%]	[-48%]	[-56%]	[-49%]
Remarried after divorce in fifties	0.0514	-0.173	1.793	0.262	0.117	-7.288
	(0.311)	(0.437)	(2.519)	(0.356)	(0.522)	(8.239)
[Cumulative marginal effect of divorcing in fifties and later remarrying]	[-31%]	[-49%]	[-44%]	[-29%]	[-44%]	[-44%]
Children (baseline: 2-3 kids)						
Indicator for 0 kids		0.0540	0.0709		0.150	0.176
		(0.183)	(0.183)		(0.172)	(0.172)
Indicator for 1 kids		-0.0955	-0.0801		-0.0922	-0.0693
		(0.138)	(0.138)		(0.133)	(0.133)
Indicator for 4+ kids		-0.187**	-0.191**		-0.228***	-0.229***
		(0.0744)	(0.0743)		(0.0749)	(0.0747)
ln(Total years worked)			-0.120***			0.343***
			(0.0420)			(0.0975)
Divorced in Fifties						
x with 0 kids		-0.752	-0.846		1.604	1.723
		(0.870)	(0.882)		(1.640)	(1.649)
x with 1 kids		-0.453	-0.506		2.735*	2.716*
		(0.691)	(0.691)		(1.636)	(1.632)
x with 4+ kids		0.389	0.392		-0.624	-0.597
		(0.496)	(0.496)		(0.657)	(0.656)
x with ln(Total years worked)			0.381			-1.643
			(0.545)			(2.092)
Remarried after divorce in Fifties						
x with 0 kids		--	--		-1.091	-0.742
		--	--		(2.015)	(2.084)
x with 1 kids		2.070	2.149		-1.483	-1.365
		(1.304)	(1.308)		(1.786)	(1.786)
x with 4+ kids		0.00810	-0.00370		1.111	1.087
		(0.661)	(0.661)		(0.720)	(0.719)
x with ln(Total years worked)			-0.555			1.976
			(0.709)			(2.191)
Observations	2,070	2,069	2,069	2,308	2,307	2,307
R-squared	0.003	0.141	0.145	0.004	0.135	0.140

Notes: Unweighted log retirement wealth in 1000s of 2014 dollars for specific women and men aged 65 or 66 in the HRS surveys (1992-2014). See notes to table 1 for a further description of the full sample and subsamples, and notes to table 4 for a description of what comprises retirement wealth, and table 10 for a description of models 1-3. The sample in this table is restricted to individuals married in their fifties, and hence have the possibility of divorcing. The sample sizes are smaller here then in table 9 because individuals without positive retirement assets are excluded and not everyone in the sample is married in their fifties. Smaller sample sizes in models 2-3 are due to missing-ness in self-reported health.

Appendix B: Asset Division By Subcategories

This appendix provides tables that consider differences in post-separation assets by the existence of community property laws, pre-separation assets, and pre-divorce work status.

As part of the HRS interview, respondents report the state in which they currently reside. Using this information, we can identify which households live in community property states where all marital assets are considered common property (and hence should be divided equally). Table 21 separates the results in Table 12 into community property and equitable distributions states.

Table 21: Assets Before and After Separation by Gender and State Divorce Law

	Prevailing State Law in State Household Lives in At Interview Before Separation	Average household assets before separation (median below)	Wife's Average assets post-separation (median below)	Husband's average assets post-separation (median below)	Percent of couples where wife ends up with 0% or less of pre-separation assets	Percent of couples where husband ends up with 0% or less of pre-separation assets	N
Total assets, Conditional on >0 household assets before separation	Equitable Distribution State	645,262	199,737	336,906	13%	14%	219
		173,707	87,722	88,276			
	Community Property State	504,945	216,838	236,080	11%	11%	61
		230,137	81,613	116,731			
Retirement assets, Conditional on >0 retirement assets before separation	Equitable Distribution State	251,123	55,699	142,863	32%	30%	132
		64,296	9,246	25,663			
	Community Property State	218,358	66,405	89,513	40%	30%	43
		84,368	8,685	23,126			
Housing assets, Conditional on >0 housing assets before separation	Equitable Distribution State	142,897	76,887	76,088	38%	44%	195
		85,536	35,000	15,791			
	Community Property State	206,391	71,144	121,142	53%	37%	51
		125,324	0	54,991			

Note: Table reflects households separating after initial HRS interview where both individuals are observed in the first interview wave after separation. Total, retirement, and housing assets are defined as in tables 3 and 5.

Table 22: Assets Before and After Separation by Gender and Pre-Separation Work Status

	Pre-Separation Work Status	Average household assets before separation (median below)	Wife's Average assets post-separation (median below)	Husband's average assets post-separation (median below)	Percent of couples where wife ends up with 0% or less of pre-separation assets	Percent of couples where husband ends up with 0% or less of pre-separation assets	N
Total assets, Conditional on >0 household assets before separation	H not FT, W not FT	530,467	226,571	359,550	18%	18%	82
		172,468	82,978	90,223			
	H not FT, W FT	494,378	241,234	178,654	13%	16%	45
		157,737	98,880	51,117			
	H FT, W not FT	912,770	118,177	360,589	9%	12%	75
		187,657	41,100	117,026			
	H FT, W FT	486,039	239,384	302,778	10%	9%	78
		200,810	123,733	101,674			
Retirement assets, Conditional on >0 retirement assets before separation	H not FT, W not FT	162,781	60,765	80,150	39%	42%	31
		56,292	18,775	13,748			
	H not FT, W FT	135,631	61,074	77,248	32%	52%	31
		65,531	8,714	-			
	H FT, W not FT	348,210	35,688	188,365	54%	22%	50
		76,703	-	42,232			
	H FT, W FT	252,005	73,751	133,483	16%	21%	63
		65,140	20,622	36,212			
Housing assets, Conditional on >0 housing assets before separation	H not FT, W not FT	167,799	92,553	90,021	43%	43%	75
		113,422	50,129	15,088			
	H not FT, W FT	166,986	76,145	69,592	26%	53%	38
		92,800	42,669	-			
	H FT, W not FT	130,629	51,331	81,460	48%	40%	63
		93,648	17,872	37,119			
	H FT, W FT	160,441	79,322	92,677	41%	39%	70
		85,369	33,474	30,974			

Note: Mean values are represented in shaded rows, and median values in un-shaded rows. H not FT stands for the husband in the pre-separation household not working fulltime. W stands for wife in the pre-separation household. Table reflects households separating after initial HRS interview where both individuals are observed in the first interview wave after separation. Total, retirement, and housing assets are defined as in tables 3 and 5.

Table 23: Assets Before and After Separation by Gender and Asset Quartile Before Separation

	Wealth quartile	Average household assets before separation (median below)	Wife's Average assets post-separation (median below)	Husband's average assets post-separation (median below)	Percent of couples where wife ends up with 0% or less of pre-separation assets	Percent of couples where husband ends up with 0% or less of pre-separation assets	N
Total assets, Conditional on >0 household assets before separation	quartile 1	32,688	27,462	65,998	27%	24%	62
		36,355	7,894	9,019			
	quartile 2	118,068	70,194	78,967	19%	18%	73
		116,986	51,006	48,721			
	quartile 3	280,120	165,764	203,961	6%	7%	72
		286,318	126,479	135,948			
	quartile 4	1,935,614	523,395	871,804	1%	7%	73
		1,013,989	381,756	416,830			
Retirement assets, Conditional on >0 retirement assets before separation	quartile 1	39,340	18,907	26,356	48%	37%	27
		21,936	1,200	9,658			
	quartile 2	97,658	16,732	49,104	42%	27%	33
		53,152	2,000	22,942			
	quartile 3	100,209	45,719	93,219	27%	38%	55
		63,371	23,371	8,220			
	quartile 4	545,687	110,508	254,132	28%	22%	60
		265,286	25,974	86,608			
Housing assets, Conditional on >0 housing assets before separation	quartile 1	31,983	23,054	23,087	49%	57%	37
		27,571	1,509	-			
	quartile 2	74,065	30,067	25,875	51%	46%	69
		71,471	-	11,743			
	quartile 3	125,258	73,971	63,007	32%	44%	68
		118,162	53,295	20,534			
	quartile 4	327,494	148,106	195,713	36%	29%	72
		273,564	93,297	138,992			

Note: Mean values are represented in shaded rows, and median values in un-shaded rows. Table reflects households separating after initial HRS interview where both individuals are observed in the first interview wave after separation. Total, retirement, and housing assets are defined as in tables 3 and 5.

Appendix C: Additional Propensity Score Matching Estimates

This appendix provides additional tables related to the propensity score matching analysis in the main text.

Table 24: Propensity Score Matching Estimates for Full-time Work by Age 62/63, 65/66, and 70/71

		Men			Women		
		Age 62/63	Age 65/66	Age 70/71	Age 62/63	Age 65/66	Age 70/71
First Interview Wave	Coef	-0.02	0.00	0.02	-0.01	0.00	0.02
	SE	0.03	0.04	0.03	0.03	0.04	0.03
	Z	-0.53	0.14	0.74	-0.44	-0.09	0.56
Age X	Coef	-0.01	0.05	-0.04	0.10	0.05	0.04
	SE	0.04	0.04	0.03	0.04	0.03	0.03
	Z	-0.20	1.38	-1.11	2.83	1.52	1.42
Difference	Coef	0.01	0.05	-0.06	0.116	0.05	0.02
	SE	0.05	0.04	0.05	0.04	0.04	0.04
	Z	0.18	1.15	-1.21	2.78	1.26	0.46

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Propensity score matching technique uses a probit model to predict the probability of separating after the first HRS interview. The four nearest neighbors are used to calculate the average treatment effect on the treated.

Table 25: Propensity Score Matching Estimates for Liquid Retirement Assets by Age 62/63, 65/66, and 70/71

		Men			Women		
		Age 62/63	Age 65/66	Age 70/71	Age 62/63	Age 65/66	Age 70/71
First Interview Wave	Coef	710.49	-5543.97	-36407.47	-8963.31	-5196.56	-21721.00
	SE	15880.34	13501.73	17425.47	14905.29	16415.14	17611.94
	Z	0.04	-0.41	-2.09	-0.60	-0.32	-1.23
Age X	Coef	-3723.49	-42664.20	-30815.22	-8087.90	16270.65	-13215.90
	SE	27502.87	40786.16	38158.10	20879.46	19456.06	25285.19
	Z	-0.14	-1.05	-0.81	-0.39	0.84	-0.52
Difference	Coef	-4433.99	-37120.23	5592.25	875.409	21467.21	8505.09
	SE	20648.22	35467.42	32425.62	17043.80	18907.10	19868.65
	Z	-0.21	-1.05	0.17	0.05	1.14	0.43

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Liquid retirement assets include DC plans and IRA account balances. Propensity score matching technique uses a probit model to predict the probability of separating after the first HRS interview. The four nearest neighbors are used to calculate the average treatment effect on the treated.