Health Insurance Coverage and Marriage Behavior: Is There Evidence of Marriage-Lock?

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Abstract

Subsidies, taxes, premiums, and eligibility for health insurance can potentially cause "marriage lock," in which couples stay married for the sake of health insurance coverage. In addition, marriage lock may change as health insurance exchanges increase health insurance options under the Affordable Care Act. In this paper, marriage lock is examined under two key insurance decisions: divorce decisions due to qualification for Medicare at age 65, and marriage and divorce decisions caused by the introduction of the Massachusetts insurance mandate and health insurance exchange market under the 2006 healthcare reform. Using the Health and Retirement Study for adults aged 60–70, I first examine whether employer-based health insurance coverage for the spouse discourages divorce for spousal health insurance coverage-dependent individuals by reviewing the discontinuity created at age 65 through qualification for Medicare. Diverse difference-in-difference models provide evidence of a 7 percent larger positive effect of Medicare eligibility on late life divorce for people with spousal insurance coverage dependence than for those without it. Next, using American Community Survey data, I examine how marriage behavior changed when the health insurance exchange market and individual mandate were introduced to Massachusetts in 2006 relative to control states. I find that the 2006 Massachusetts healthcare reform increased incentives for marriage in the health insurance exchanges market. Specifically, the Massachusetts reform appears to have reduced the divorce rates by approximately 0.5 percent and increased marriage rates by approximately 1.4 percent. My estimates in the paper provide some evidence that "marriage lock" exists and further suggest that health insurance coverage could serve as a marriage lock and the price of health insurance also plays an important role.

Key Words: Marriage Lock, Medicare, Health Insurance Exchanges, Employer Sponsored Health Insurance, Health Care Reform, Marriage Behavior

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1 Introduction

The predominant source of health insurance in the United States is employer-sponsored health insurance (ESI). Nearly two-thirds of adults under age 65 and three-quarters of all full-time workers obtain health insurance through their employers (U.S. Census Bureau, 2007). A potential cost of this reliance on ESI is the non-portability of insurance across employers, which is likely to result in "job lock," a phenomenon whereby people stay in jobs that they might otherwise leave.

A similar concern regarding disruptions to health insurance coverage may also influence the decisions of individuals contemplating divorce. People currently covered by their spouse's ESI lose such coverage on divorce. Potential divorcees may face high premiums in the individual health insurance market or the possibly prohibitive health costs of being uninsured. Furthermore, changes in health plans and providers might be disruptive and costly. Unless they have alternative sources of health insurance coverage, such as ESI through their own employer or Medicare or Medicaid, this health insurance conundrum could result in "marriage lock," which functions in a similar manner to a job lock, might cause people to remain married despite wanting a divorce.

Individuals dependent on a spouse's ESI prior to divorce are among the most vulnerable to insurance loss after divorce. Such potential divorcees must search for alternative insurance sources to prevent gaps in coverage and may need to rely on the individual non-group health insurance market. The shortcomings of this market are well documented and can create significant barriers to coverage for divorcees without their own sources of health insurance. Compared to ESI plans where employers contribute almost 80 % of a single premium, non-group health insurance policies are typically more expensive for comparable benefits because of higher administrative costs and higher cost sharing. In 2009, the average annual premium for non-elderly single policies was $2985. The average premiums are substantially higher for older people ($5755 for single policies for people aged 60–64). To obtain an affordable policy, non-

group purchasers often forego critical benefits such as pharmaceuticals and mental health services. In addition, in most states, individuals attempting to purchase insurance can be denied coverage due to their health status, age, or other risk factors. If sold a policy, they may be charged more because of these factors, and particular types of care may be excluded from coverage.

There has been a patchwork of federal and state laws attempting to help dependent spouses obtain health insurance coverage after divorce. For example, the Consolidated Omnibus Budget Reconciliation Act, known as COBRA, is a federal law that allows divorcees to continue to use an ex-spouse's coverage for up to 36 months. However, the protections offered within this patchwork have significant limitations. The COBRA coverage is expensive; people must pay the full cost of the premium plus a 2 percent administrative fee. Thus, COBRA coverage may be out of reach financially for many divorcees.

The underlying theoretical model mostly commonly used to analyze marriage behavior is based loosely on the Becker model of marriage (Becker, 1981). The Becker model suggests that divorce occurs when the expected utility from being married is less than the expected utility from being single. For people who depend on their spouse's health insurance, leaving a marriage implies leaving the guarantee of subsidized health insurance coverage. The spouse's ESI could be considered part of the value of the marriage because of the uncertainty of the non-group health insurance marketplace. Many people may decide to stay in their current marriage despite incentives for divorce because they are afraid they may be denied health insurance coverage due to pre-existing conditions or lose access to trusted providers or may be unable to afford healthcare premiums.

In the USA, most individuals become eligible for public health insurance (Medicare) at age 65. Attaining Medicare eligibility immediately reduces the value an individual places on a spouse's health insurance coverage and therefore on their marriage. According to the Becker model, when an individual who depends on their spouse's health insurance coverage qualifies for Medicare at age 65, reductions in the value of marriage increase the probability of divorce. My findings demonstrate that individuals who lack an alternative source of health insurance

coverage except through a spouse's insurance plan are more likely to get divorced after they qualify for Medicare, suggesting that health insurance coverage can serve as a marriage lock.

This issue has taken on new salience with the passage of the Affordable Care Act of 2010 (ACA). Under ACA, access to high-quality, subsidized health insurance coverage is no longer exclusively tied to employment. States create “exchanges” where individual consumers can purchase insurance, and neither pre-existing condition exclusions nor premiums based on health status are permitted. Furthermore, under this act, the government provides subsidies to qualifying low- and moderate-income individuals to increase the affordability of such coverage. With the health insurance exchange market, individuals can buy health insurance coverage directly from the exchanges and become less dependent on a spouse’s healthcare insurance or ESI. In addition, the individual mandate under the health care reform makes health insurance coverage mandatory, which strengthens the importance of health insurance coverage on marriage behavior. The ACA has the potential to weaken the marriage lock; thus, studying the effects of health insurance coverage on marriage behavior in the health insurance exchange market is important.

Given these concerns, it is surprising that very few studies have examined whether the current health insurance system affects marriage behavior. To address this question, the role of health insurance coverage in marriage behavior is examined in two separate sections in this paper.

In the first section, I examine whether health insurance coverage affects late-life divorce by exploiting the abrupt change in health insurance coverage that occurs at age 65 due to Medicare. Focusing on individuals aged 60 to 70, the discontinuity in coverage suggests that a difference-in-difference (DID) comparison between the divorce flow for individuals dependent on spousal health insurance coverage who are younger than 65 and the divorce flow for those who are age 65 and older provides a test of the marriage lock hypothesis. Divorce flow is a variable for measuring the flow of divorce, which is defined in my regressions as a dummy variable of whether an individual gets divorced between the interview waves. Although previous studies have exploited the discontinuity in health insurance coverage created by Medicare (e.g., Card et al., 2008, 2009), no studies have identified the effects of health insurance coverage on late-life

divorce or marriage behavior. To my knowledge, this is the first study that uses the discontinuity created by Medicare to test the marriage lock hypothesis.

My estimation results confirm that individuals who lack an alternative source of health insurance coverage are more likely to stay married because they may face high premiums in the individual health insurance market or a discontinuity in treatment if they change insurance plans. As expected, parameter estimates implied that qualification for Medicare at age 65 increases the probability of divorce by approximately 7% for individuals dependent on spousal insurance coverage compared with for those who are not dependent. In addition, I use several triple-difference models to estimate the interaction among spousal employer-based insurance coverage dependence, lack of alternative access to public health insurance (e.g., Medicaid or Medicare obtained before age 65), and age of Medicare eligibility. I find that individuals who have a single access point, i.e., a spousal employer-provided health insurance plan, are approximately 6% more likely to leave their marriage after age 65 than individuals who have access to an alternative source of health insurance prior to age 65. These results are not sensitive to dependent variables, and I do not find evidence from additional specification estimates that other factors such as retirement, social security, and full retirement are responsible for the increase in divorce flows after an individual turns 65.

Second, the effects of health insurance coverage on marriage behavior are likely influenced by the current healthcare reform. In many ways, the reforms included in the ACA were modeled on Massachusetts's comprehensive approaches to expanding health insurance coverage. The Massachusetts healthcare insurance reform law, enacted in 2006, mandates that nearly every resident of Massachusetts obtain a state government-regulated minimum level of healthcare insurance coverage. Furthermore, the law provides free healthcare insurance for residents earning less than 150% of the federal poverty level (FPL). Among its many effects, the law established Massachusetts's exchange market, the Commonwealth Health Insurance Connector Authority (known as the Connector), which offers private insurance plans to residents. In the second section of this paper, Massachusetts is used as the treatment group and compared with

other states without such healthcare reform. I use the DID approach for changes in Massachusetts residents' marriage behavior from 2006 as a function of access to alternative health insurance coverage in the state's Connector exchange market. Estimates in the second section suggest that the incentives for marriage improve under the 2006 Massachusetts health care reform; the divorce rate in Massachusetts has been reduced by approximately 0.5% since 2006, and marriage rates have increased by approximately 1.4%.

The estimations from the two sections shed light on whether the current health insurance system affects marriage behavior in the United States. The results suggest that health insurance coverage may serve as a marriage lock, possibly due to the high cost of health insurance. When alternative cheap or almost free health insurance plans are available, such as Medicare, couples may be more likely to divorce. In contrast, the individual mandate requires nearly everyone to purchase health insurance coverage, although insurance plans on the health exchange market may still be relatively expensive despite government subsidies. Thus, under the current healthcare reform, individuals may be more likely to get or stay married because of coverage by spousal health insurance.

This is a promising direction for future research, and much is to be gained from an investigation of whether and how health insurance coverage empirically influences marriage behavior. This paper suggests that the past emphasis of the United States on ESI may limit the flexibility of marriage and influence decisions of individuals regarding marriage and divorce; the results are of considerable interest to policymakers who promote marriage and marital stability. In contrast, understanding the effects of allowing spousal coverage through ESI and changes in the health insurance markets on marriage behavior is becoming increasing important as we continue to restructure our health care system.

2 Literature Review

The existing economic literature on health insurance and family structures has primarily

focused on estimating how the marriage and divorce law revolution in the United States has affected the marriage behavior and the labor supply of couples, as well as the impact of health insurance coverage on labor force participation and self-employment.

A large body of work in family economics analyzes how various public policies may affect people's marriage behavior and family structure (e.g., the unilateral divorce law and the same-sex marriage law). Peters (1986) shows that unilateral divorce has basically no effect on the probability of divorce as suggested by the Coase theorem. Allen (1992) argues that transaction cost is significant in marital bargaining, and he shows that the reform produced a significant increase in divorce rates when the no-fault divorce laws were introduced. Rasul (2006) and Mechoulan (2006) suggest that the divorce rate rose sharply following the adoption of unilateral laws; however, the increase was reversed within approximately a decade possibly because of better marital sorting. Gruber (2004) confirms that unilateral divorce regulations significantly increased the incidence of divorce by using 40 years of census data to exploit the variation across states and over time in divorce regulation changes. He find that adults who were exposed to unilateral divorce regulations as children were less well educated, had lower family incomes, married earlier, and separated more often. In addition, Buchmueller and Carpenter (2010) use the California Health Interview Survey to study the response of same-sex couples to the option of receiving health insurance through a spouse's employer and find that lesbians are more likely to have insurance through a spouse's employer and less likely to work full-time.

However, it is surprising that almost no studies have examined whether the current health insurance system limits marriage behavior. In this paper, I address the lack of current research on the topic of marriage lock by providing a new study of whether and how the U.S. health insurance system affects marriage behavior.

In contrast, health benefits play an important role in individuals' decisions concerning labor force participation and self-employment. The predominant source of health insurance in the United States is ESI. Historically, health benefits were offered in tight labor markets as a method of attracting employees (Fronstin, 2006). Employees who prefer health insurance coverage may

be willing to forgo other benefits, job attributes, or wages in order to obtain employer-provided coverage (Rosen, 1986). Many economists and health policy experts believe that tying health insurance coverage to job status causes people to stay in jobs that they might otherwise leave, or job lock.

A large body of literature examines the job lock effect of ESI on employer-to-employer mobility. Madrian (1994) estimates that job lock reduces the voluntary turnover rate of those with ESI by 25 percent. Rust and Phelan (1997) study how the U.S. Social Security and Medicare insurance systems affect the labor supply in the presence of incomplete markets for loans, annuities, and health insurance. They find significant "security value" for individuals to remain employed until they are eligible for Medicare coverage at age 65. Rogowski and Karoly (2000) study the role of health insurance in the retirement decisions of older workers. They use data from the 1992 and 1996 Health and Retirement Survey to demonstrate that access to post-retirement health insurance has a large effect on retirement. They find that older male workers with retiree health benefit offers are more likely to retire than their counterparts who lose employment-based health insurance upon retirement. Gruber and Madrian (2004) conduct a literature review and document the distortions to the labor market associated with such a system, including limited job-to-job mobility and distorted retirement decisions. They conclude that health insurance has important effects on both labor force participation and job choice, but that it is not clear whether these effects result in large losses of either welfare or efficiency.

Besides the literature on “job lock,” some recent papers have empirically analyzed the effects of health insurance coverage on entrepreneurship and self-employment. Fairlie, Kapur, and Gates (2011) use data from the 1996 to 2006 Current Population Survey (CPS) to find large, statistically significant results indicating that men and women are less likely to start businesses if they do not have a spouse with employer-based insurance and if there is a family member in bad health. They also focus on the increase in probability of self-employment when an individual becomes eligible for Medicare and is no longer dependent on employment associated with insurance coverage for access to guaranteed comprehensive insurance coverage. They find that

the increase in the probability of owning a business once an individual reaches age 65 is 13 percent. A study by the Urban Institute (2013) estimates that an additional 1.5 million people will launch their own business and become self-employed because of key provisions in the ACA that make high-quality insurance on the open market more accessible and affordable. Significant barriers to coverage are eliminated and more people are able to start their own business without risking denial of coverage or not being able to afford the premiums.

Similar effects of health insurance coverage may also apply to welfare recipients or the disabled population; tying health insurance coverage to benefits may exacerbate the strong incentives to never leave welfare/disability. Evidence suggests that "welfare lock" is statistically significant but relatively small in magnitude (Ellwood and Adams, 1990; Yelowitz, 1995; Livermore, Roche, and Prenovitz, 2009). In addition, access to spousal health insurance has been used in several studies on health insurance and job mobility or business creation (Madrian, 1994; Holtz-Eakin et al., 1996; Kapur, 1998; Madrian and Lefgren, 1998; Wellington, 2001).

From the literature, it is clear that health insurance is an important determinant of concepts such as retirement decisions, limited job-to-job mobility, entrepreneurship, and self-employment decisions. However, no studies have identified the effects of health insurance coverage on late-life divorce or marriage behavior. To my knowledge, this is the first study that bridges health insurance coverage and marriage behavior by using the discontinuity in health insurance coverage created by Medicare and health insurance exchanges to test the marriage lock hypothesis.

3 Model

I develop a model for the decision to divorce in order to understand how health insurance coverage affects marriage behavior, especially for potential divorcees who are approaching age 65 and will qualify for Medicare. This model may also be applied to marriage decisions and the effect of the health insurance exchange on the divorce and marriage decision. In other words, a model allows for changes over time in the utility from marriage and in the available premiums

on various health insurance markets.

Becker, Landes, & Michael (1977) and Becker (1981) suggest that divorce occurs when the expected utility from being married is less than that from being single. This situation exists because marriage as a transaction may be costly to enter and leave in terms of time, money, and effort.

Based on Becker's model on decision-making in marriage, first consider a general model with identical men and women that are in the marriage market for each other, with strictly quasi-linear preferences, as follows:

$$U_j = V_j + \left(H_j - \pi_j\right), \quad j = M, S. \tag{2.1}$$

where *M* denotes married and *S* denotes single/divorced. V is the utility gain measured in dollar units from a set of variables could affect marriage and divorce decision (e.g. children, income, retirement and love); and H is the utility gain measured in dollar units from having health insurance coverage; π is the premium/cost of health insurance; and $(H - \pi)$ is the net value from having health insurance coverage.

For simplicity, I assume there is no variation in insurance quality, i.e. H is assumed to be the same for all insurance plans. The premiums available to divorcees at different ages vary. In addition, I assume individuals only have ESI in marriage and do not change their health insurance choices if they stay married. Divorcees choose health insurance plans on the individual non-group market before age 65 and on the Medicare thereafter. That is,

$$H_S = H_M,\ \pi_M = \pi_{ESI},\ \pi_S = \begin{cases} \pi_{Nongroup}, if\ age < 65 \\ \pi_{Medicare}, if\ age \geq 65 \end{cases} \text{ and } \pi_{Medicare} < \pi_{ESI} < \pi_{Nongroup}.$$

Figure 1 illustrates health insurance premiums for potential divorcees by age. The figure shows that premiums in the individual non-group market are at high levels and that they keep increasing from age 60 to age 65. Then, after individuals reach age 65, premiums decrease sharply to a very low and constant level because of Medicare.

To decide whether to leave or enter into a marriage, individuals choose the following:

$$Max\ [U_M - U_S, 0]$$

$if\ U_M - U_S \geq 0$, he/she stays married; $if\ U_M - U_S < 0$, he/she divorces.

Next, I have

$$U_M - U_S = V_M + (H_M - \pi_M) - V_S - (H_S - \pi_S) = V_M - V_S + (\pi_S - \pi_M)$$
$$= \begin{cases} V_M - V_S + \left(\pi_{Nongroup} - \pi_{ESI}\right), if\ age < 65 \\ V_M - V_S + (\pi_{Medicare} - \pi_{ESI}), if\ age \geq 65 \end{cases} \quad (2.2)$$

In conclusion, before age 65, individuals stay married as long as $\pi_{Nongroup} \geq \pi_{ESI} + (V_S - V_M)$. After age 65, divorce occurs as long as $\pi_{Medicare} < \pi_{ESI} + (V_S - V_M)$.

If $V_S - V_M = 0$, that is, the basic utility of being single equals to the basic utility of staying married despite health insurance coverage, the individual is indifferent between divorce and marriage. Because $\pi_{Medicare} < \pi_{ESI} < \pi_{Nongroup}$, potential divorcees choose to stay married before reaching 65 and divorce thereafter.

Figure 2 shows the decision-making process in Equation 2.2 by illustrating the net utility gain from marriage for potential divorcees as a function of age. Because premiums in the individual non-group market keep increasing from age 60 to age 65, the net utility gains from marriage keep increasing. However, premiums decrease sharply to the constant Medicare premium level after age 65, and the utility gain from marriage also drops sharply. If the net utility gain is still larger than or equal to zero, the individual chooses to stay married; if the net utility gain from marriage is smaller than zero, the divorce incentives increase, possibly causing the individual to choose to divorce.

Finally, I add some randomness to the identical individual model by introducing a random error term ε_{it} to equation 2.1. Now I have

$$\Delta U_{it} = \Delta V_t + \Delta \pi_t + \varepsilon_{it}, \quad (2.3)$$

where $\Delta U_{it} = U_{Mit} - U_{Sit}$, $\Delta V_t = V_{Mt} - V_{St}$, $\Delta \pi_t = \pi_{St} - \pi_{Mt}$, $and\ \varepsilon_{it} = \varepsilon_{Mit} - \varepsilon_{Sit}$.

Thus, individuals choose to divorce if $\varepsilon_{it} < -\Delta V_t - \Delta \pi_t$. Note ΔV_t is assumed to be identical for everyone and $\Delta \pi_t$ depends only on age.

Now, I would like to make two different assumptions about the distribution of ε_{it}. On one hand, if ε_{it} is independent and identically distributed, the probability of getting divorced each

period goes up when $\Delta\pi_t$ becomes less positive. Thus, this model implies a shift in the divorce curve after individuals becoming eligible for Medicare. On the other hand, if ε_{it} is a permanent individual effect, there is a spike in the divorce rate at the time of Medicare eligibility.

The real world could be a combination of the two. That is, the abrupt change in health insurance coverage that happening at age 65 due to Medicare will increase the divorce flow at age 65, as well as shift the divorce pattern after age 65.

At last, I expand the model for marriage behavior on the health insurance exchange market by taking into account the ongoing reform in the health insurance system. Under the health care reform, the individual mandate requires almost everyone to have health insurance. The health insurance exchange market will provide subsidized health insurance plans to low-income individuals, while people with the lowest incomes will get free health care.

Since the health care reform and exchange will affect individuals differently, I assume there are three different subgroups in the population according to income. The first subgroup has the lowest income level, i.e., under 150% of the federal poverty line (FPL), and can obtain almost free public health. The second subgroup has the second lowest income level, i.e., between 150% and 300% of the FPL, and this group of individuals can buy subsidized health insurance plans on the exchange. The third subgroup consists of individuals with higher incomes, i.e., above 300% of the FPL and these individuals will not have access to the health insurance exchange. For simplicity, I will call these groups the low-income group, the medium-income group, and the high-income group, respectively.

As in the previous model, I assume single individuals will choose the cheapest health insurance available to them, while individuals who are married have ESI coverage and will not change their plan choice. That is, $\pi_M = \pi_{ESI},\ \pi_S^L = 0,\ \pi_S^M = \pi_{Exchange},\ \pi_S^H = \pi_{Nongroup}$ and $0 < \pi_{ESI} < \pi_{Exchange} < \pi_{Nongroup}$.

Individuals will decide between marriage and remaining single by comparing the utility gain from marriage with zero. Now I have,

$$U_M - U_S = V_M - V_S + (\pi_S - \pi_M) = V_M - V_S + \left(\pi_{Exchange} - \pi_{ESI}\right) = \Delta V + \Delta\pi. \qquad (2.4)$$

For the low-income group, individuals could get free health care if they remained in this low-income category. However, marriage would probably increase the family income level, thereby eliminating access to free health care. In that case, $\Delta\pi = 0 - \pi_{ESI} < 0$, and the marriage incentive may decrease for those individuals in this category.

For the medium-income group, single individuals will be able to buy health insurance on the health insurance exchange. The premium that they will face on the exchange will be lower than the premium on the non-group market, since government subsidies will make coverage on the exchange more affordable. However, even the subsidized health insurance plans on the exchange are still more costly than employer-sponsored health insurance, at least in the current reform stage. That is, $\Delta\pi = \pi_{Exchange} - \pi_{ESI} > 0$, and a positive $\Delta\pi$ will make the individuals prefer marriage life to single life.

For the high-income group, single individuals still face the individual non-group market as they did before the health care reform. Since $\Delta\pi = \pi_{Nongroup} - \pi_{ESI} > 0$, individuals are more likely to get or stay married.

In the early stage of health care reform, the cost of health insurance on exchanges is still higher than the cost of employer-sponsored health insurance. As long as $\Delta\pi > 0$ for most of people, incentives for marriage will increase while incentive for divorce will decrease on the exchange.

4 Data

For the first section on the Medicare market, I use Health and Retirement Study (HRS) data to study whether the qualification for Medicare increases late-life divorce flows. The HRS is a longitudinal panel study that surveys a representative sample of more than 26,000 Americans over the age of 50 every 2 years, collecting information regarding every respondent's income, work, retirement, marriage status, assets, social security incomes, pension plans, health insurance, disability, health status, and healthcare expenditures. The HRS questions ask individuals whether they divorced between the recent interview waves (i.e., which are every 2 years); thus, I use a

probability distribution for the age of divorce for each respondent who reported that they got divorced between the most recent interview waves. Furthermore, I use simulations to check for robustness.

For the second section, which is on the exchange market, I use the 2001–2011 American Community Survey (ACS), which includes households and people representing 1 percent of the American population for the 11 years from 2001 to 2011. To study how marriage behavior is affected by the operation of an exchange market under the current healthcare reform, Massachusetts, with the first health exchange market (named "Connector") open to residents in 2006 (and the only one before the ACA), is used as the treatment group. New Jersey and Connecticut are chosen as the control group, having the most similar divorce and marriage patterns as Massachusetts before 2006. The ACS data sample that I use for the second section also has a very large sample size, and includes 329,666 observations in Massachusetts, 430,490 observations in New Jersey, and 174,789 observations in Connecticut. Focusing on both marriage and divorce rates in the second section, I construct the sample to include all individuals aged 20 to 64 in the treatment and control groups. I do not focus on people aged 65 and older in this analysis because individuals who are eligible for Medicare should not be affected by the exchanges, which is confirmed by the additional analysis.

5 Methods

Because there might be an effect at the group level (i.e., age clustering in the first section and state clustering in the second section), I mainly take two approaches to control for potential clustering of errors. I first follow the one step method to estimate the Eicker-White clustered standard errors at the group level. However, the standard asymptotic arguments for the consistency of clustered standard errors may not apply with the small number of groups in this study's context; I still run the risk of underestimating standard errors and over-rejecting the null hypothesis using the one-step approach. Therefore, I adopt the two-step estimator suggested by Donald and Lang (2007) and make the generous assumption that unobserved cluster effects are

drawn from a homoskedastic normal distribution.

5.1. One-Step Approach for Difference-in-Difference and Triple-Difference Estimators

5.1.1. The First Section of Age Eligibility for Medicare on Late-Life Divorce

For the first section on the Medicare market, I first use a DID model to examine whether health insurance coverage affects divorce rates for individuals with spousal health insurance coverage dependence by exploiting the discontinuity created at age 65 when individuals qualify for Medicare. Then, I use the triple-difference approach to study how the variation at the age 65 cutoff has affected individuals who have a single source of spousal health insurance coverage versus individuals who have their own public health insurance coverage.

I estimate a DID model to study the divorce behavior for individuals with spousal coverage dependence when considering that eligibility for Medicare that starts at age 65. I construct the main experimental group of spousal coverage dependence, in which individuals either provide employer sponsored health insurance to their spouse or get coverage from the spouse's employer sponsored insurance[1]. I isolate the effects of the "Medicare notch" on late-life divorce by estimating the interaction term between the age eligibility for Medicare and the group dummy for individuals with spousal coverage dependence, addressing concerns about the potential influence of observables such as age, retirement, and social security benefits on the results. The approach is useful for identifying whether marriage lock exists for individuals with spousal coverage dependence. Empirically, I estimate the following model:

$$Y_{ist} = \beta 1 + \beta 2 M_{it} + \beta 3 T_{it} + \beta 4 (M_{it} * T_{it}) + \beta 5 X_{ist} + \lambda_t + \delta_s + \varepsilon_{ist}\,, \qquad (5.1)$$

where Y_{ist} equals to 1 if the individual got divorced between interview waves. M_{it} denotes

[1] I remove both these spouses with their own employer-sponsored health insurance and those who reported covering each other from my treatment group.

whether an individual or his/her spouse is equal to or older than 65. T_{it} denotes whether an individual is in the treatment group of spousal coverage dependence, that is, whether the individual provides ESI coverage to or gets it from his/her spouse. The coefficient on the interaction between eligibility for the treatment group and qualification for Medicare at age 65, $\beta 4$, captures the DID estimate for marriage lock. In addition, X is a vector of demographic and control variables, λ_t is the year dummy, and δ_s is the region effect.

The HRS interviews respondents every 2 years and asks them whether they got divorced between recent interview waves. I cannot, however, identify the actual year or age of divorce for individuals who reported that they got divorced between recent interview waves. There are three possibilities for the actual year of divorce, that is, people could get divorced in the current interview year, the past year, or 2 years before the interview year (i.e. t, $t-1$, or $t-2$, respectively.) Therefore, I estimate this model by assigning a probability to the respondents' divorce years according to the distribution assumption based on the weights of the length of time between interview waves. That is, people could get divorced in the past full year ($t-1$) with probability 0.5, in the current interview year (t) with probability 0.25, or 2 years before the interview year ($t-2$) with probability 0.25. [2]

In addition, to further investigate the Medicare notch effect on late-life divorce for individuals with spousal coverage dependence but with other sources of public health insurance coverage, I estimate a triple-difference model for individuals who have a single source of spousal health insurance coverage versus those having their own public health insurance coverage. Individuals who have only a single source of spousal employer-provided health insurance plan are supposed to be more likely to leave marriage after age 65 than individuals who have access to an alternative source of public health insurance (e.g., Medicaid or Medicare obtained before age 65). Empirically, I estimate the following DID model:

[2] In addition, these probabilities are consistent with the distribution from a small sample with the actual age of divorce reported in the HRS.

$$\mathrm{Y}_{ist} = \beta 1 + \beta 2 M_{it} + \beta 3 T_{it} + \beta 4 G_{it} + \beta 5 (T_{it} * G_{it}) + \beta 6 (M_{is} * G_{it}) + \beta 7 (M_{it} * T_{it} * G_{it}) + \beta 8 X_{ist} + \lambda_t + \delta_s + \varepsilon_{ist} \quad (5.2)$$

where Y_{ist} equals to 1 if the individual gets divorced between the interview waves. M_{it} denotes whether the age of an individual or his/her spouse is equal to or older than 65. T_{it} denotes whether an individual is in the treatment group of spousal coverage dependence, that is, whether the individual provides ESI coverage to or obtains ESI coverage from his/her spouse. G_{it} denotes whether an individual has other public health insurance, such as Medicaid or Medicare obtained before age 65. The coefficient on the interaction term among eligibility for the spousal coverage dependence group, the group dummy for owning other public health insurance, and qualification for Medicare at age 65, $\beta 7$, captures the DID estimate of marriage lock. In addition, *X* is a vector of demographic and control variables, λ_t is the year dummy, and δ_s is the region effect.

5.1.2. The Second Section of Massachusetts Health Care Reform on Marriage Behavior

For the second section on the exchange market, I use the DID method to study Massachusetts residents' marriage behavior after the Connector exchange market went operational in 2006, comparing with other states without health care reform. In addition, I use a triple difference approach to study how the variation has affected different age groups and income groups.

Although there is considerable flexibility in the choice of control groups in a DID estimator, the comparability of the two groups is important to obtain a consistent estimator. The key assumption, which is likely to hold only if the groups are comparable, is that the outcome in treatment and the control group follow the same time trend in the absence of the treatment. Figure 4 provides a description of the variation of divorce and marriage rates for Massachusetts, New Jersey, and Connecticut from 2001 to 2011.[3] To better conduct the DID method used in this

[3] In general, northeastern states have lower divorce rates because their citizens are more highly educated and tend to marry at older ages than do people in other regions. New Jersey, New York, and Massachusetts are among the

section, I choose New Jersey as the control group, the state with the most similar divorce and marriage patterns as Massachusetts before 2006, as shown in Figure 4, and I add Connecticut to the control group to increase the robustness of the analysis. The DID method allows me to consider the pre-existing differences between the treatment and control groups and the general time trend by measuring divorce rates and marriage rates both before and after the implementation of the Connector health exchange market in the representative sample of both the participating (i.e., Massachusetts) and non-participating states (i.e., New Jersey and Connecticut). In general, I estimate the following DID model:

$$Y_{ist} = \beta 1 + \beta 2 Treat_{is} + \beta 3 Post_{it} + \beta 4 (Treat * Post)_{ist} + \beta 5 X_{ist} + \lambda_t + \delta_s + \varepsilon_{ist}\,, \quad (5.3)$$

where the dependent variable Y_{ist} is equal to 1 if the individual is getting a divorce in the divorce estimation or if the individual is getting married in the marriage estimation. $Treat_{is}$ is a dummy indicating whether the individual is in the treatment group, that is, a resident of Massachusetts. $Post_{it}$ is a post-treatment dummy indicating whether the year is after 2006. X_{ist} is a vector of demographic characteristics and control variables. δ_s is the state effect, and λ_t is the year dummy. The coefficient on the interaction between Massachusetts residency and the availability of the Connector exchange market (since 2006), $\beta 4$, captures the DID estimate of the effect of healthcare reform on Massachusetts residents' marriage behavior.

The DID estimate for residents in Massachusetts does not take account that the health care reform may have differentially affected the marriage behavior of residents of different income and age groups. For example, individuals below 150% of the FPL could get free health insurance under the reform. Likewise, subsidized health plans in the exchange are available to individuals who make below 300% of the FPL. There are three general income groups: under 150% of the

wealthier states in the nation and economic stability also contributes to marital stability. Thus, I graph divorce and marriage rates for seven states: New York, New Jersey, Connecticut, Vermont, Maine, and New Hampshire. I find that New Jersey has the most similar pattern to Massachusetts regarding both marriage and divorce rates and Connecticut is the second most similar.

FPL, between 150-300% of the FPL, and above 300% of the FPL. I also create four age groups, comprising individuals aged 20-29, aged 30-39, aged 40-49, and aged 50-64, respectively. The effects of health care reform on marriage behavior are predicted to be the most pronounced for individuals who could access the health insurance exchange market, i.e., those individuals between 150% and 300% of the FPL, while individuals below 150% of the FPL or above 300% of the FPL are not supposed to be affected as much. Furthermore, individuals aged 50-64 who have a higher demand for health insurance because of age but who are not yet eligible for Medicare should be affected the most. Similarly, young adults aged 20-29, many of whom did not have health insurance before the reform, may change their marriage behavior in response to the individual mandate after the reform.

Thus, I use a triple-difference approach to study how the variation has affected different age and income groups. The triple difference estimates can adjust the simple before/after 2006 change in marriage and divorce rates for both general trends affecting Massachusetts residents, and trends differentially affecting individuals in different income and age groups. Empirically, I estimate the following triple difference model:

$$Y_{ist} = \beta 1 + \beta 2 Treat_{is} + \beta 3 Post_{it} + \beta 4 Group_{is} + \beta 5 (Group * Post)_{ist} + \beta 6 (Treat * Group)_{is} + \beta 7 (Treat * Post * Group)_{ist} + \beta 8 X_{ist} + \lambda_t + \delta_s + \varepsilon_{ist} \quad (5.4)$$

where the dependent variable Y_{ist} is equal to 1 if the individual is getting a divorce in the divorce estimation or if the individual is getting married in the marriage estimation. $Treat_{is}$ is a dummy indicating whether the individual is a resident of Massachusetts. $Post_{it}$ is a post-treatment dummy indicating whether the year is after 2006. $Group_{is}$ is a full set of dummies indicate whether the individual is in a specific age or income group. X_{ist} is a vector of demographic characteristics and control variables. δ_s is the state effect, and λ_t is the year dummy. The coefficient on the interaction among Massachusetts residency, the availability of the Connector exchange market (since 2006), and the dummy indicating a specific age or income

group, $\beta 7$, captures the triple difference estimate of the effect of healthcare reform on marriage behavior for the specific age or income group in Massachusetts.

5.2. Two-Step Estimators

Out of concern that clustering breaks independence, that is, individual shocks within a given cluster (age or state) share a common component (an age-level/state-level shock), a two-step approach suggested by Donald and Lang (2007) is used for both sections. I have few groups and a large number of observations for each group and I make one more assumption, that is, that the cluster-level shocks have a normal distribution. Thus, the two-step estimator produces standard errors that appropriately consider the group-specific term. To implement the two-step estimator, I first regress the outcome variables on all individual-level variables and a full set of group dummies, or a full set of interaction terms involving group dummies. In the second stage, the estimated coefficients from these group dummies or a full set of dummies for the group-related interaction terms are used as the dependent variables, with all group level variables as the independent variables. The resulting standard errors from this second-stage model are calculated considering the group component. Together with the second-stage coefficients, these form *t* statistics that have a *t* distribution when the number of groups is small. In sum, the first-stage regression produces estimates of the group level means after considering the variation in the other individual controls. In the second stage, I estimate how much of this variation in these estimated group-level means is predicted by variation in groups.[4]

6 Results

I construct two main estimation sections to identify the effect of health insurance coverage status on marriage behavior. In the first section, I take advantage of the abrupt change in health insurance coverage occurring at age 65 because of Medicare. I explore whether the gain in health

[4] This approach to estimating appropriate standard errors in a DID specification is discussed in Donald and Lang (2007). For more details on this procedure, the reader is referred to this reference.

insurance at age 65 encourages individuals with spousal coverage dependence to divorce. In the second section, I study whether individuals living in Massachusetts who could access the Connector health insurance exchange market since 2006 would be more likely to change their marriage status under the healthcare reform, as compared with individuals living in other states,.

6.1 The Effect of Medicare Coverage on Late-Life Divorce

In the first section, I restrict the sample to individuals who are either married or divorced. To focus the analysis around age 65, when individuals qualify for Medicare, I further limit the sample to individuals aged 60 to 70. As the number of observations gets small and the coefficient estimates become erratic when the age of the older spouse exceeds 71, the age of the older spouse is set to be between 58 and 71.

6.1.1. Difference-in-Difference Estimates

I cannot obtain the direct effect of health insurance coverage on divorce from the whole population because the effect may be contaminated by unmeasured variables (e.g., marriage and job quality). Therefore, I only focus on individuals with spousal coverage dependence whose divorce decisions may be affected by health insurance coverage. After the age of 65, individuals automatically qualify for Medicare, which provides universal access to health insurance coverage. Because individuals with health insurance coverage dependence no longer have to be concerned about losing spousal health insurance coverage after age 65, the value they place on spousal health insurance coverage or current marriage is reduced. According to the model, the probability of divorce should increase after age 65 for these individuals.

Table 1 reports the DID estimates from Eq. 5.1 considering whether either spouse is age 65 or older. I report both the one-step OLS estimates and the two-step estimates. The coefficient on the interaction term between the age 65 cutoff dummy variable and the spousal coverage dependence group dummy is positive and statistically significant under both the one-step OLS and the two-step estimation, suggesting that individuals with spousal coverage dependence are

approximately 7% more likely than individuals without such dependence to get divorced when either of the spouses qualifies for Medicare at age 65. In other words, individuals with spousal coverage dependence are more likely to be deterred from divorce before age 65 because of their current health insurance status. The positive and significant coefficient is consistent with the notion that a spouse's employer-provided health insurance coverage is a disincentive to divorce before age 65. Generally, the signs, magnitudes, and significance levels of the coefficients are stable across specifications. The divorce rates decrease with the number of children, years married, times married, age, and family income, whereas personal income, education level, disability, and retirement increase the divorce rate.

I also investigate whether the effect of Medicare eligibility on late-life divorce is a one-time effect at age 65 or a permanent effect that persists after age 65. To do so, I create two age cutoff dummy variables for Medicare eligibility, that is, one where either spouse's age is equal to 65 (age = 65) and the other where either spouse is older than 66 (age $\geq$ 66). Table 2 reports the DID estimates from Eq. 5.1 using these two age cutoff dummies. The coefficient on the dummy where (age = 65) suggests that individuals are approximately 8% more likely to get divorced at age 65, when they qualify for Medicare, and the coefficients on the (age $\geq$ 66) dummy suggest they are approximately 6% more likely to get divorced after age 65. The coefficients for the interaction term between the (age= 65) dummy and the spousal coverage dependence group dummy are significant in both the one-step OLS estimation and two-step estimation, while the interaction term evolving the (age $\geq$ 66) dummy is not significant in the two-step estimation.

Figure 3 depicts the age variation in divorce flow between the ESI coverage dependence group and the "no such dependence" group by plotting the difference of the first step coefficients between the groups.[5] Figure 3 shows a spike at age 65, which suggest that lots of individuals with spousal coverage dependence experience a divorce at age 65. Besides of the high premiums

[5] The first-step coefficient for the dependent group is the estimated coefficient of the interaction terms between the treatment group (ESI Coverage Dependence Group) dummy and age (the age of the older spouse) using the two-step estimation method; the first-step coefficient for the non-dependent group is defined similarly for the control group without such an ESI coverage dependence. The difference in the first-step coefficients for the dependent and non-dependent groups refers to the difference in the first-step coefficients estimates for the two groups.

and cost sharing on the non-group market, potential divorcees choose to stay in marriage because they are afraid of being rejected with pre-existing conditions for new insurance policies after their divorce. However, COBRA allows divorcees to stay on their ex-spouse's ESI coverage for up to three years by paying 102% of the full premium themselves, which is nevertheless more affordable than the plans on the non-group market. In this arrangement, divorcees will furthermore not be rejected for coverage based on pre-existing conditions. Due to COBRA policies, the cost of divorce falls as people approach age 65 and so this figure shows a build-up starting from age 62 rather than a perfect spike at age 65.

In addition, consistent with the Figure 3, the econometrics presented in Table 3 show that 65 is the most important age. Table 3 reports the results of a test of the spike and shift in Figure 3, as well as a placebo test for other ages, which regress the difference in the first-step coefficients between two groups on the age trend, an age dummy for age X (X=58, 59…71), and a post-65 dummy. Specification 8 including a dummy for age 65 is the key regression, which is to test for the spike at age 65 and the shift after age 65. All other specifications are placebo tests for other ages. The results in Table 3 show that from age 58 to 71, only the coefficient for the age 65 dummy is significant and has the largest effect (about 8%). Coefficients of dummies for other ages are not significant and are much smaller in magnitude.

Figure 3 and Table 3 confirm the prediction in the theory part that there will be a spike of divorce flow at age 65 for individuals with spousal coverage dependence. Figure 3 also shows a higher level of divorce flow after age 65 than before age 65, though the estimated coefficient for the post 65 dummy is not statistically significant in Table 3.

6.1.2. Difference-in-Difference-in-Difference Estimates

For individuals with spousal coverage dependence, some may also have other public health insurance for themselves, such as Medicaid or Medicare obtained before age 65 because of disabilities. Individuals with their own sources of public health insurance are supposed to be less dependent on spousal coverage and thus less affected by marriage lock. Individuals with spousal

coverage dependence face a potential disruption in health insurance coverage when leaving their current marriage, whereas individuals with their own public health insurance coverage may not face that disruption. Thus, individuals who rely on their spouse's health insurance coverage and do not have access to an alternative plan may be more likely to be deterred from divorce because of health insurance coverage issues before age 65.

Therefore, I use the triple-difference model in Eq. 5.2 to estimate the interaction among the age 65 cutoff dummy variable, the spousal ESI coverage dependence group dummy, and the "lacking other public health insurance coverage" group dummy. The "lacking other public health insurance coverage" group is defined as individuals who do not have Medicaid or "pre-65" Medicare. The coefficients on the interaction term shown in Table 4 are positive and statistically significant, suggesting that among individuals with spousal ESI coverage dependence, those with a single source of spousal ESI coverage are approximately 6% more likely to divorce when they qualify for Medicare at age 65 than those with other public health insurance, such as Medicaid or Medicare obtained before age 65. In Table 4, the positive and significant estimated effects are robust for all specifications, which suggests that a lack of access to one's own health insurance is a disincentive to divorce before age 65 for those with spousal coverage dependence.

Table 5 reports the triple-difference estimates from Eq. 5.2 using both "whether either spouse's age is equal to age 65" and "whether either spouse's age is older than age 66" as the age cutoff dummies for Medicare qualification. The coefficients on the interaction terms of the age 65 cutoff dummy variable, the spousal ESI coverage dependence group dummy, and the "lacking other public health insurance coverage" group dummy are also positive and statistically significant, suggesting that among individuals with spousal ESI coverage dependence, those that only have spousal ESI coverage are approximately 8% more likely to divorce when they qualify for Medicare at age 65 than people with other public health insurance, such as Medicaid or Medicare obtained before age 65. Furthermore, estimates show that they are approximately 5 percent more likely to divorce after age 65.

6.1.3. Potentially Confounding Factors

The changes in the probability of divorce observed around age 65 may be due to some other changes in work status or social security benefits, which may be a concern. For instance, individuals may divorce at age 65 because of their transition to retirement, which may be irrelevant to qualifying for Medicare. Thus, I must investigate whether there exist other confounding factors that cause changes in marriage behavior around the time that individuals turn 65. To determine if these factors drive the results, I include controls for retirement, full retirement (i.e., whether the individual is retired at the full retirement age), and social security in my regressions.

Retirement

To investigate whether retiring or dropping out of the work force affects the divorce decision at age 65, I control for retirement in my regression. The estimates are reported in all specifications (Tables 1-5). I find positive coefficient estimates on the retirement variable which are not significant for most specifications; however, the key coefficient estimate on the interaction term between the age cutoff for Medicare and the spousal coverage dependence group remain significant and robust,[6] which suggests that retirement is not responsible for the primary changes in marriage behavior at age 65.

The effect of Medicare coverage on late-life divorce may be underestimated because individuals who retire because they qualify for Medicare at age 65 may decide to divorce later because of problems and conflicts occurring after retirement. Thus, this kind of divorce flow may be attributed to the effect of Medicare eligibility at age 65 on late-life divorce.

Social Security and Full Retirement

[6] In addition to estimations that are not reported in the attached tables, I exclude retirement in the estimation and obtain similar results for the interaction term between age cutoff for Medicare and the spousal coverage dependence group to the estimates I reported in Tables 1-5 when retirement is included. The results remain robust regardless of whether I control for social security or full retirement in the estimation.

Another major concern is that there might exist other confounding factors that lead to changes in marriage behavior at age 65, such as social security benefits. This is because there is a social security rule about full retirement that could create an incentive to divorce under social security at full retirement age. The full retirement age for full social security benefits is the age at which a person may first become entitled to full or unreduced retirement benefits; this age is approximately 66 for individuals in my dataset. The rule suggests that, people aged 62 or older and unmarried after divorce could receive social security benefits on his/her ex-spouse's record after divorce (even if the ex-spouse has remarried), as long as the ex-spouse is entitled to social security retirement benefits and the marriage lasted 10 years or longer.[7]

The coefficients on social security income reported in all specifications of Tables 1-5 are negative and insignificant, suggesting that individuals may be less likely to get divorced with higher social security benefits. The coefficient on full retirement is also negative and insignificant, suggesting that individuals are less likely to divorce at their full retirement age, that is, at age 66 in my sample. A possible explanation is that individuals with an incentive to divorce who stay in marriage may treat the marriage as something they would like to escape from. There are two exits to escaping the marriage: qualifying for Medicare at age 65 or reaching full retirement at age 66. The social security rule suggests that divorce at age 65 does not affect the benefits they receive from their ex-spouses at age 66. Therefore, individuals with incentives for divorce use the exit at age 65 by qualifying for Medicare to escape marriage. Hence, very few remain to use the second exit at age 66, that is, at full retirement age.

In summary, the addition of the covariates does not have a significant effect on the estimated relationship between the key interaction term and divorce flow. The coefficient estimates on the interaction term between the age cutoff for the Medicare dummy and the spousal coverage dependence group dummy remain significant and robust, which rules out the possibility that retirement, full retirement, and social security benefits generate the main changes in marriage

[7] Refer to “Retirement Planner: If You Are Divorced” on the official U.S. Social Security website: http://www.ssa.gov/retire2/divspouse.htm.

behavior around age 65.

6.1.4. Simulation for Robustness Check

One limitation of using panel data from the HRS is the reliance on the distribution assumptions for the respondents' ages of divorce. Thus, I use a simulation to run the probability assignment process 10,000 times. I find roughly similar-sized point estimates, as shown in Table 6, which reports the simulated results for both one-step OLS estimators and two-step estimators for both DID and triple-difference models, which are consistent with previous estimation results. Panel A reports the coefficient and standard errors for the key independent variable, which is the interaction term between the age $\geq$ 65 cutoff dummy variable and the spousal coverage dependence group dummy in DID estimations, or the interaction term among the age $\geq$ 65 cutoff dummy variable, the spousal coverage dependence group dummy, and the "without other public health insurance" group dummy in the triple-difference estimations. Similarly, Panel B reports the coefficient and standard errors for the key independent variable, which is the interaction term between the two age cutoff dummies (i.e., age = 65 and age $\geq$ 66) and the spousal coverage dependence group dummy in the DID estimations, and the interaction term among the two cutoff dummy variables, the spousal coverage dependence group dummy and the "without other public health insurance" group dummy in the triple-difference estimations. In general, the simulated estimates in Table 6 show robustness and the results do not appear sensitive to changes of covariates and estimation methods.

All the estimations in the first section rely on the assumption that potential divorcees rely heavily on Medicare coverage rather than on other possible sources of health insurance coverage after divorce. The best protection against insurance loss for those individuals is stable long-term employment in jobs that offer a direct source of insurance coverage. Although some spouses may actively look for jobs with health insurance during a divorce, it is unlikely that this search drives the entire relationship, especially in late adulthood. I do not capture the effect from divorcees who concurrently find insured jobs during or after the divorce.

6.2 The Effect of Health Insurance Exchanges on Marriage Behavior

The general approach taken in the second section to identify the effect of health care reform on marriage behavior is to compare the divorce and marriage rates between the treatment group (i.e., residents of Massachusetts) who obtained additional access to health insurance plans in the health insurance exchange market under the 2006 reform and a control group, which did not.

6.2.1 Difference-in-difference Estimates and State-Specific Time Trend

Specifications 1 and 4 respectively show the one-step OLS and two-step estimators for the DID estimation results of the divorce rates in Tables 7 and marriage rates in Table 8 , between Massachusetts and New Jersey. The divorce estimates in Table 7 shows that the interactions between Massachusetts residency and the availability of the Connector exchange market since 2006 are negative and statistically significant for all specifications, suggesting that individuals are approximately 0.5 percent less likely to be divorced in Massachusetts under the 2006 health care reform.

The marriage estimates in Table 8 show that the interaction between Massachusetts residency and the availability of the Connector exchange market since 2006 is positive and statistically significant across specifications. In Specification 4, the two-step estimator for the interaction term suggests an approximate 1.5 percent increase in the marriage rate in Massachusetts since 2006, which is a large effect relative to the state's average marriage rate of 5.6 percent. This suggests that providing additional access to health insurance coverage in the health insurance exchange market encourages marriage for residents of Massachusetts under the 2006 Massachusetts Health Care Reform.

In Specification 2 of Tables 7 and 8, I allow for a state-specific time trend in estimating Equation 5.3, which provides slightly larger and generally consistent estimates as the results from other specifications. In general, these results show that individuals are approximately 1.5% more likely to be married and 0.5% less likely to be divorced in Massachusetts in the years

following the implementation of the health reform as compared with the years marked by the absence of the healthcare reform. The signs, magnitudes, and significant levels of the coefficients are stable between different specifications.

Figures 5 and 6 depict the year variations in divorce and marriage, respectively. The divorce patterns in Figure 5, as well as the marriage patterns in Figure 6, are similar for Massachusetts and New Jersey before 2006. However, the divorce and marriage patterns for Massachusetts changed significantly after 2006 relative to those of New Jersey. Figure 6 shows that Massachusetts's divorce rate is generally higher than New Jersey's, but the difference between the two states reduced significantly after 2006. Similarly, Figure 6 shows that Massachusetts's marriage rate is generally lower than New Jersey's, but that this rate increased in Massachusetts after 2006. Figures 5 and 6 suggest that the healthcare reform is not a one-time effect that occurred only in 2006, but a permanent effect on marriage behavior after 2006.

As the model part suggests, the results in the second section suggest that residents in Massachusetts who have additional access to health insurance coverage in the health insurance exchanges market are more likely to get and stay married, because of the various prices of health insurance coverage on the ESI market and on the health insurance exchange market. For most people, Medicare is nearly free or low-cost as long as they or their spouses pay Medicare taxes while they are employed. Thus, thee results in the first section suggest that individuals are more likely to leave marriage when qualifying for Medicare at age 65, when health insurance coverage becomes cheap. In contrast, unlike Medicare, the health insurance plans in the exchange market may be still expensive for many individuals. In addition, the 2006 Massachusetts Health Care Reform contains not only the additional access to health insurance coverage in the exchange market but also pressure in the form of the individual mandate, which requires nearly all residents to purchase health insurance coverage if they meet minimum standards or to pay a hefty tax fine if affordable coverage is available to them and they do not enroll.[8] In that case, to avoid paying

[8] The tax penalties for being uninsured as of 2011 are as follows: The tax penalty for individuals between the ages of 18 and 26 with incomes above $32,496 who do not have health insurance is $72 per month. For people 27 or older with incomes above $32,496, the penalty increases to $101 per month. Penalties are doubled for two parent

penalties or paying high premiums on the exchange or in the non-group market, individuals are more likely to get or stay married to obtain coverage from the spouses.

In conclusion, health insurance coverage may serve as a marriage lock, whereas the price of health insurance is the key to this lock. When there are free or cheap health insurance plans available, such as Medicare, couples can escape from marriage; in contrast, when an individual mandate requires nearly everyone to purchase health insurance coverage and the health exchange market can only provide people with relatively expensive health insurance plans, people may lock themselves into marriage to get covered by spousal health insurance.

Another possibility for improving marriage incentives under the healthcare reform may be explained by a recent report released by the Oregon Health Insurance Experiment.[9] This broad research program is expected to yield insights into the effects of expanding public health insurance. This study indicates that enrollment in Medicaid substantially increases the use of healthcare services, lowers rates of depression, reduces financial strain, and improves self-reported health and well-being. Thus, people under the healthcare reform have increased incentives for marriage, probably because health insurance coverage can make them feel happier, less stressed, and more optimistic about their health status; furthermore, health insurance coverage may also provide them a sense of security from financial hardship, as suggested by the Oregon study. For all these reasons, expanding health insurance coverage can increase the incentives for marriage under the healthcare reform.

6.2.2 Connecticut Added to Control Group

The estimation results for adding Connecticut to the control group in Specifications 3 and 5

families, in which both are uninsured. Individuals with incomes of less than $16,248 per year and families with incomes of less than $33,084 (based on a family of four) are exempt from the tax penalty.

[9] The Oregon Health Insurance Experiment, an outgrowth of Oregon's 2008 lottery to allocate Medicaid slots to eligible residents, released their second year of results in May 2013. Evidence using the randomized controlled design showed that Medicaid coverage generated no statistically significant improvements in measured physical health outcomes in the first 2 years, but did generate increased healthcare use, higher rates of diabetes detection and management, lower rates of depression, and lower financial strain.

in Tables 7 and 8 are somewhat similar. Specification 3 reports the regular OLS estimates with robust standard errors clustered at the state level, and Specification 5 reports the two-step estimates. Similar to the results in other specifications, the coefficients on the interaction between Massachusetts residency and the availability of the Connector exchange market since 2006 are positive for marriage rates and negative for divorce rates, both of which are statistically significant under the one-step OLS estimation. However, the two-step estimate for the divorce estimation in Speciation 5 of Table 6 is no longer significant. The coefficient estimates imply that the probability of marriage increased approximately 1.2% and that the probability of divorce decreased approximately 0.4% in Massachusetts since the operation of the health exchange market started in 2006.

6.2.3 Triple-Difference Estimates

I also focus primarily on various effects of the 2006 Massachusetts Health Care Reform on different income and age groups. I use triple difference methods for these subgroups estimations.

Income Penalty Groups

Table 9 reports the main effects for three income penalty groups: below 150% of the FPL, 150% to 300% of the FPL, and above 300% of the FPL. Specification 1 reports regular OLS estimates with robust standard errors clustered at the state level, and Specification 2 controls for the state-specific time trend. In addition, the two-step estimates that adjust for standard errors are reported in Specification 3. The estimates in Table 9a show that the effects of the healthcare reform on divorce are pronounced mostly for individuals between 150% and 300% of the FPL with relatively low income who are not eligible for Medicare. Individuals between 150% and 300% of the FPL are approximately 1.4% less likely to be divorced in the years following the implementation of the healthcare reform in Massachusetts as compared with before. In contrast, individuals in the groups of that make under 150% of the FPL and those that make above 300% of FPL are not significantly affected in their divorce decisions by the healthcare reform.

In Table 9b, I find that the most pronounced effect of the healthcare reform on marriage is still for individuals in the category of 150-300% of the FPL, that is, people with relatively low income who are not eligible for Medicaid or free health care under the reform. Those individuals are approximately 2.7% more likely to be married in the years following the implementation of the healthcare reform in Massachusetts than prior. However, people who are under 150% of FPL or above 300% of FPL are not significantly affected in their marriage decisions by the healthcare reform.

Age Groups

By including the dummies for all age groups using the triple difference methods, I capture the effects of the changes in marriage behavior for different age groups associated with the healthcare reform.

Table 10 shows the possible effects of the Connector on divorce among four age groups: 20 to 29, 30 to 39, 40 to 49, and 50 to 64. Specification 1 reports regular OLS estimates with robust standard errors clustered at the state level and Specification 2 controls for the state-specific time trend. In addition, the two-step estimates to adjust for standard errors are reported in Specification 3. In Table 10a, the 2006 healthcare reform seems to have the greatest and most significant effect on divorce rates for individuals aged 50 to 64, estimated as an approximate 0.6% reduction in the probability of divorce. The largest effect found on the age group from 50 to 64 may be because those individuals have a larger demand of health insurance than young people while they are not eligible for Medicare yet. Thus, they react more strongly than other age groups to the healthcare reform. Moreover, it may be explained by combining the results found in the first section on Medicare. That is, as approaching the age of Medicare qualification, people are more reluctant to divorce and more likely to stay married before age 65.

In Table 10b, I find that the health exchanges have a large and significant effect on marriage rate for people aged 50 -64, as well as people aged 20–29. Estimates show that individuals aged 50 to 64 are 1.5% more likely to be married after the 2006 health care reform, while young adults

aged 20 to 29 are estimated to show a 1.8% increase in the probability of marriage. This is likely because those young adults are mostly likely to be uninsured before the healthcare reform, and now seek ways to obtain health insurance coverage under the individual mandate, that is, from their spouses after marriage.

6.2.4 Elderly Population Estimates as a Placebo Test

Lastly, I estimate a regression as a placebo test that only includes people aged 65 and older in the sample, who already have access to Medicare health insurance coverage to test whether there are still significant changes in the divorce and marriage rates in Massachusetts after 2006.

Tables 11a and 11b report estimates of divorce and marriage rates in Massachusetts compared with the control state, New Jersey, for people aged 65 and above. In Table 11a, the coefficient on the interaction between Massachusetts residency and the availability of the Connector exchange market since 2006 is negative for divorce rates estimation; however, it is not statistically significant. Thus, there is no significant change in the divorce rate in Massachusetts compared with the control state for those aged 65 and above. The estimates in Table 11b report that Massachusetts residents aged 65 and older are approximately 0.7% more likely to be married in the years following the implementation of the healthcare reform than prior. However, the two-step estimate in Specification 3 is not significant either. Generally speaking, the large reduction in magnitude and statistical significance level suggest that health insurance exchanges probably have very little effect on marriage behavior for people who already have Medicare health insurance coverage.

7 Conclusion

Parameter estimates in the first section imply that age eligibility for Medicare among married couples aged 60 to 70 with spousal coverage dependence increases the probability of divorce by 7%. I also find that the divorce flow rates at age 65 when people qualify for Medicare are substantially lower among those who have their own public insurance as compared with those

who have insurance coverage only through a spouse.

In the second section, I focus on how marriage behavior changes on the exchange market under the current healthcare reform using Massachusetts as the treatment group, which has had access to the Connector exchange market since 2006. I find that the Connector operation in Massachusetts reduces divorce rates by approximately 0.5% and increases marriage rates by approximately 1.4%. The effects are most pronounced for individuals living at between 150-300% of the FPL who have access to the health insurance exchange.

My estimates from the two sections provide some evidence that marriage lock exists. These estimates further suggest that health insurance coverage could serve as a marriage lock and that the price of health insurance could be the key. When there are cheap or almost free health insurance plans available such as Medicare, couples may be more likely to escape from marriage. In contrast, the insurance plans on the health exchange market are still relatively expensive even though government subsidies make them more affordable. Therefore, individuals could have increased incentives for marriage to get coverage from spousal health insurance under the current healthcare reform.

8 Discussion

The enacted Affordable Care Act (ACA) stipulates that individuals are able to purchase insurance from insurance exchanges. Insurers are not allowed to have pre-existing condition exclusions or premiums priced on the basis of health status. These features of ACA may encourage marriage flexibility by providing potential divorcees with a health insurance option should they leave their current marriage. However, a disparity between the value of health coverage through the exchanges and the value of coverage through some existing employer plans is likely to persist for some time (Eibner et al., 2010). Thus, the empirical research in the second section demonstrates a significant increase in the marriage rate and a significant reduction in the divorce rate under the 2006 Massachusetts health care reforms, suggesting that the incentives for marriage have improved in the United States as a result of the current implementation of

healthcare reform.

However, the value of insurance provided through the exchanges will be influenced by the method in which states choose to structure them. The ACA will be phased in over the next few years with a high-risk pool for purchasing insurance, and ultimately, it will have insurance exchanges in 2014. With the deepening of the healthcare reform, health insurance will become increasingly affordable. In July 2013, New York State insurance regulators said that individuals buying health insurance on their own would see their premiums drop the next year in New York as the changes under the federal healthcare law take effect. In addition, they have approved rates for 2014 that are at least 50% lower on average than those currently available in New York. The extraordinary decline in New York's insurance rates for individual consumers demonstrates the profound future of the health insurance exchanges, such as universal coverage, more affordable individual health insurance, and the removal of the marriage lock.

Investigating the impact of these changes on health insurance markets and marriage behavior under the healthcare reform will be an interesting area for future research. For instance, it will be important to examine whether marriage lock disappears when the insurance prices in the exchange markets are low enough and whether equilibrium exists, for example, when the price in the exchange market equals to the price people pay for ESI coverage.

In summary, in the future, we will see more states like Massachusetts and New York that are setting up exchanges under the ACA—where competition and transparency in the exchange marketplaces are leading to more affordable health insurance coverage, and marriage lock is likely to eventually disappear as the price in the individual health insurance market decreases. The effect of health insurance coverage on marriage behavior is a problem that deserves our full attention, especially under the current healthcare reform. Hopefully, this paper paves the road for more sophisticated empirical studies in the future.

Figure 1: Health Insurance Premiums for Potential Divorcees by Age

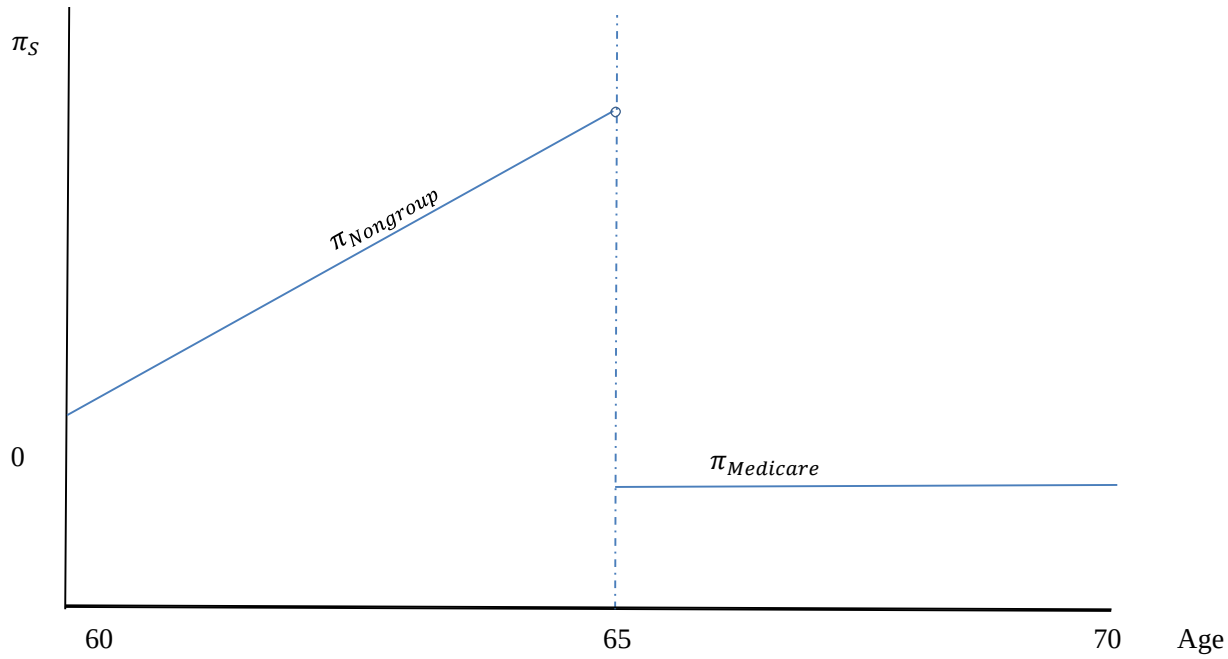


Figure 2: Net Utility Gain from Marriage for Potential Divorcees by Age

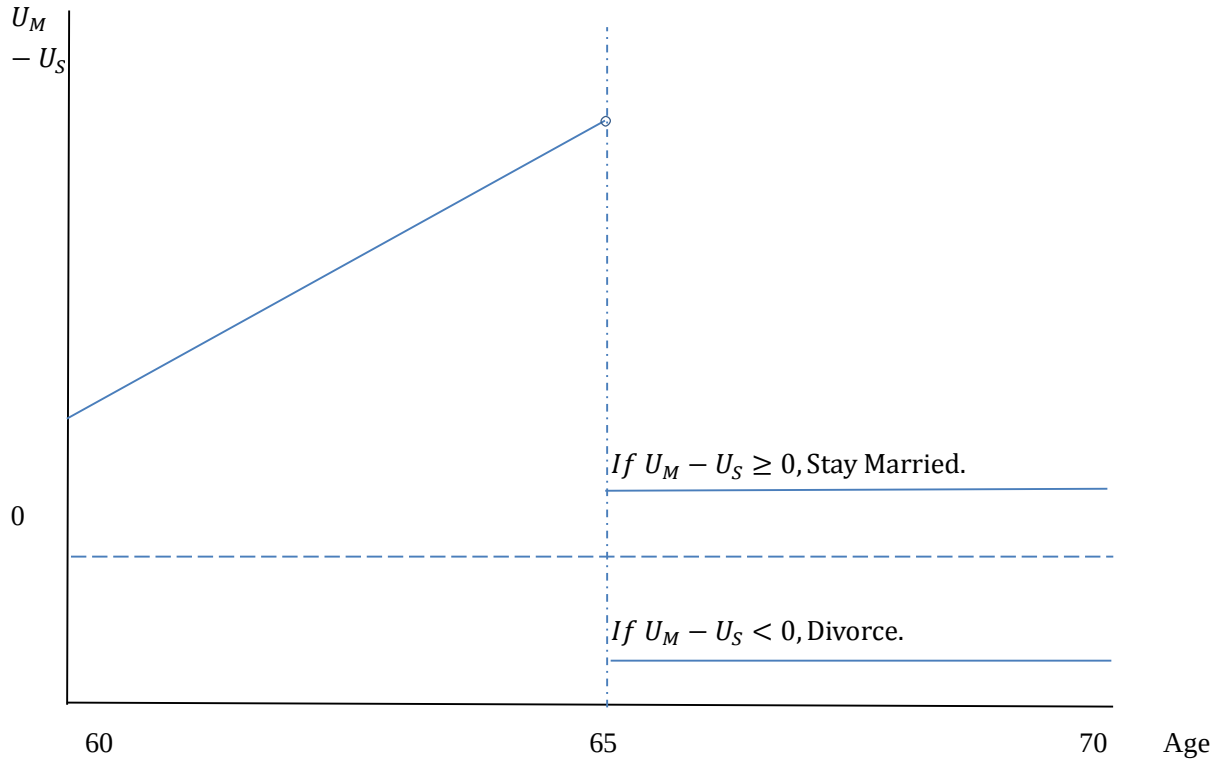
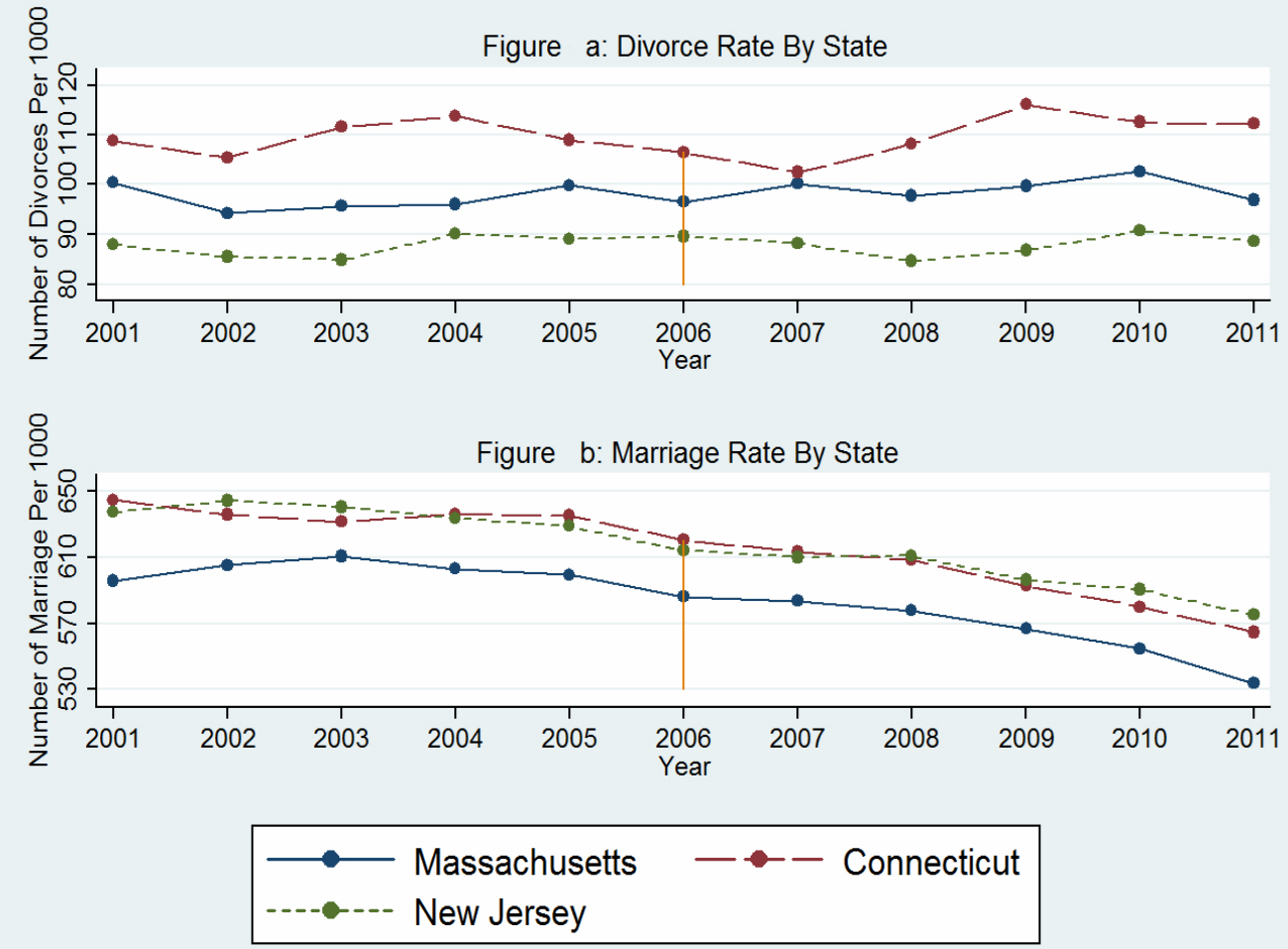


Figure 3: Difference in the First Step Coefficients for Spousal Coverage Dependent Group and Non-Dependent Group



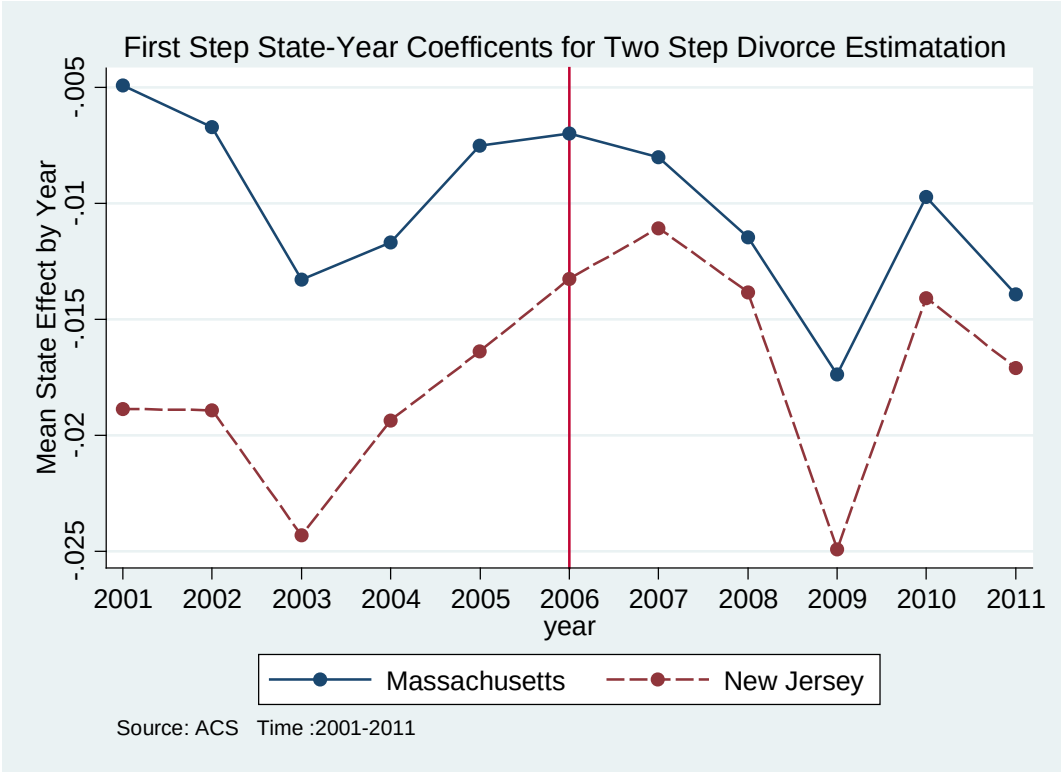
Note: Source: HRS 1992-2010. Individuals in the sample are either married or divorced. Spousal coverage dependence group refers to individuals who or whose spouses have a single source of health insurance from the spouse's ESI coverage. "The first-step coefficient for dependent group" is the estimated coefficient of the interaction terms between treatment group (ESI Coverage Dependence Group) dummy and age (the older age of the spouses) by using the two-step estimation method; "The first-step coefficient for nondependent group" is defined similarly for the control group without such ESI coverage dependence. And the "difference in the first step coefficients for dependent and nondependent group" is the difference of the first-step coefficients estimates for the two groups.

Figure 4: Divorce Rates and Marriage Rates for Massachusetts, New Jersey and Connecticut



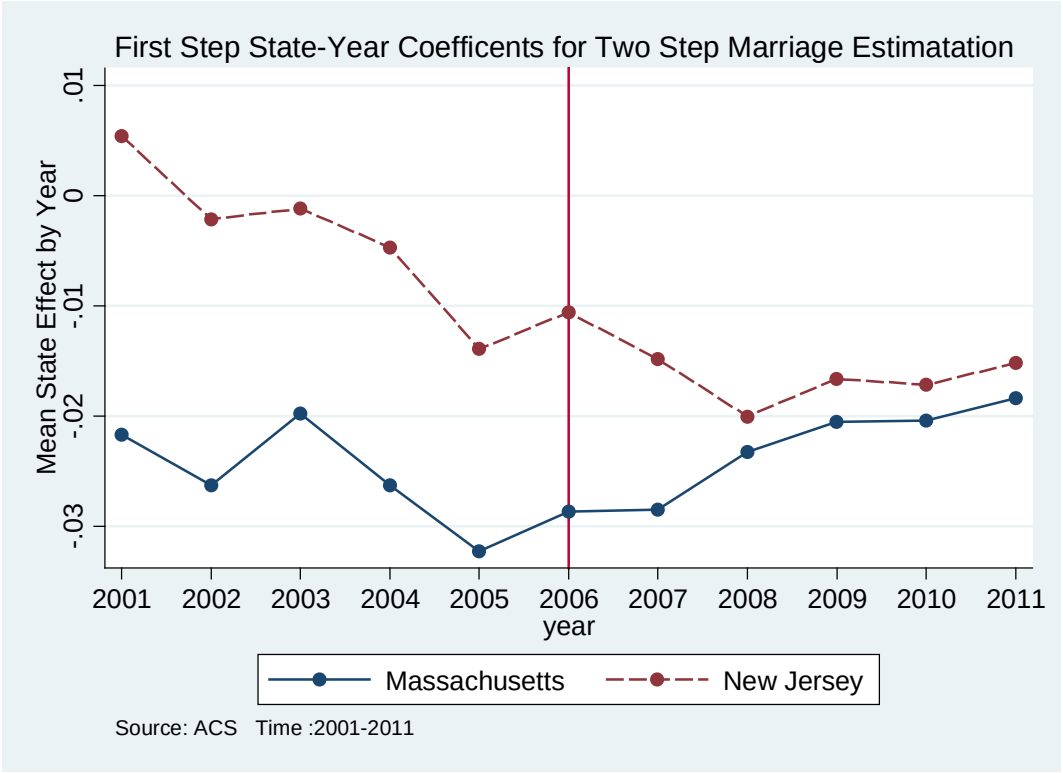
Note: Divorce rate is defined as number of individuals who is being divorced per 1000 population in Figure 6a, and marriage rate is defined as number of individuals who is being married per 1000 population in Figure 6b. Individuals in the sample between age 20 to 64. Data source is American Community Survey (ACS) 2001-2011 and N=934,945.

Figure 5: First Step State-Year Coefficients for Divorce Estimation between Massachusetts and New Jersey



Note: Data source is American Community Survey (ACS) 2001-201, and individuals in the sample are between age 20 to 64. The treatment state is Massachusetts, and the control state is New Jersey. The "Mean State Effects by Year" are the estimates for the coefficient of the interaction terms between state and year from the first step by using the two-step estimation method.

Figure 6: First Step State-Year Coefficients for Marriage Estimation between Massachusetts and New Jersey



Note: Data source is American Community Survey (ACS) 2001-201, and individuals in the sample are between age 20 to 64. The treatment state is Massachusetts, and the control state is New Jersey. The "Mean State Effects by Year" are the estimates for the coefficient of the interaction terms between state and year from the first step by using the two-step estimation method.

Table 1: Difference in Difference Estimates of Divorce Rate for Medicare Eligibility (Age>=65)

Whether the Individual Is	OLS		Two Step Estimator	
Recently Divorced	(1)	(2)	(3)	(4)
Either Spouse's Medicare	-.0539***	-.0581***	-.0616***	-.0469***
Eligibility (Age >=65)	(.0123)	(.0123)	(.0106)	(.0127)
Spousal Coverage Dependence	-.0701***	-.0123***	-.0701***	-.0327**
Group	(.0032)	(.0019)	(.0067)	(.0136)
Spousal Coverage Dependence	.0716***	.0708***	.0695***	.0650**
* Either Spouse's (Age>=65)	(.0082)	(.0078)	(.0094)	(.0293)
Personal Income	3.84e-07***	3.90e-07***	3.86e-07***	3.86e-07***
	(1.07e-07)	(1.04e-07)	(8.10e-08)	(8.10e-08)
Family Income	-1.76e-07**	-1.70e-07**	-1.76e-07***	-1.76e-07***
	(6.62e-08)	(6.28e-08)	(2.61e-08)	(2.61e-08)
Education Level	.0017*	.0019*	.0017*	.0017*
	(.0009)	(.0009)	(.0010)	(.0010)
Self-Reported Health Status	.0036	.0033	.0037	.0037
	(.0025)	(.0025)	(.0026)	(.0026)
Gender	.0453***	.0425***	.0448***	.0448***
	(.0059)	(.0058)	(.0059)	(.0059)
Race	-.0036	-.0029	-.0037	-.0037
	(.0076)	(.0075)	(.0053)	(.0053)
Disability	.0156	.0151	.0149	.0149
	(.0089)	(.0088)	(.0092)	(.0092)
Years Married	-.0065***	-.0062***	-.0064***	-.0064***
	(.0002)	(.0002)	(.0002)	(.0002)
Times Married	-.0120**	-.0096*	-.0118***	-.0118***
	(.0053)	(.0051)	(.0038)	(.0038)
Number of Children	-.0081***	-.0080***	-.0080***	-.0080***
	(.0006)	(.0006)	(.0013)	(.0013)
Post-Retirement ESI	-.0023	-.0022	-.0020	-.0020
	(.0065)	(.0066)	(.0062)	(.0062)
Age	-.0075***	-.0073***	-.0096***	-.0117***
	(.0016)	(.0016)	(.0012)	(.0015)
Retirement	.0068	.0070	.0070	.0070
	(.0050)	(.0050)	(.0045)	(.0045)
Social Security Income	-.0033	-.0043	-.0035	-.0035
	(.0034)	(.0032)	(.0080)	(.0080)
Fully Retirement	-.0023	-.0027	-.0020	-.0020
	(.0023)	(.0031)	(.0050)	(.0050)
Year Effect & Cohort Effect	Yes	Yes	Yes	Yes
Group Specific Age Trend	No	Yes	No	Yes

Note: Source: HRS 1992-2010. N=57,480. Age Range is 60 to 70. Individuals in the sample are either married or divorced. *, ** and *** indicate significance at 10%, 5%, and 1% respectively. Estimates are using the assumption with probabilities assigned for the age of divorce. Standard errors for OLS regressions are robust, clustered by age and are shown in parentheses. For Specification for two-step estimator, the estimates for the first three key independent variables are reported from the second step, and all others estimates are reported from the first step.

Table 2: Difference in Difference Estimates of Divorce Rate for Medicare Eligibility (Age=65) and (Age>=66)

Whether the Individual Is Recently	OLS		Two Step Estimator	
Divorced	(1)	(2)	(3)	(4)
Either Spouse's Medicare	-.0597***	.0613***	-.0674***	-.0551***
Eligibility (Age =65)	(.0137)	(.0143)	(.0148)	(.0140)
Either Spouse's Medicare	-.0501***	-.0559***	-.0612***	-.0381**
Eligibility (Age >=66)	(.0129)	(.0128)	(.0124)	(.0142)
Spousal Coverage Dependence Group	-.0701***	-.0113***	-.0701***	-.0445***
	(.0033)	(.0019)	(.0069)	(.0146)
Spousal Coverage Dependence	.0815***	.0741***	.0821***	.0775***
* Either Spouse's (Age =65)	(.0128)	(.0118)	(.0194)	(.0267)
Spousal Coverage Dependence	.0672***	.0649***	.0673***	.0612
*Either Spouse's (Age >=66)	(.0082)	(.0075)	(.0101)	(.0580)
Personal Income	3.84e-07***	3.90e-07***	3.86e-07***	3.86e-07***
	(1.07e-07)	(1.04e-07)	(8.10e-08)	(8.10e-08)
Family Income	-1.76e-07**	-1.70e-07**	-1.76e-07***	-1.76e-07***
	(6.61e-08)	(6.27e-08)	(2.61e-08)	(2.61e-08)
Education Level	.0017*	.0019*	.0017*	.0017*
	(.0009)	(.0009)	(.0010)	(.0010)
Self-Reported Health Status	.0036	.0033	.0037	.0037
	(.0025)	(.0025)	(.0026)	(.0026)
Gender	.0454***	.0425***	.0448***	.0448***
	(.0058)	(.0057)	(.0059)	(.0059)
Race	-.0036	-.0030	-.0037	-.0037
	(.0076)	(.0075)	(.0053)	(.0053)
Disability	.0159	.0151	.0149	.0149
	(.0090)	(.0088)	(.0092)	(.0092)
Years Married	-.0065***	-.0062***	-.0064***	-.0064***
	(.0002)	(.0002)	(.0002)	(.0002)
Times Married	-.0120**	-.0096*	-.0118***	-.0118***
	(.0053)	(.0051)	(.0038)	(.0038)
Number of Children	-.0081***	-.0080***	-.0080***	-.0080***
	(.0005)	(.0005)	(.0013)	(.0013)
Post-Retirement ESI	-.0023	-.0022	-.0020	-.0020
	(.0065)	(.0066)	(.0062)	(.0062)
Age	-.0076***	-.0074***	-.0095***	-.0126***
	(.0016)	(.0016)	(.0013)	(.0017)
Retirement	.0069	.0070	.0070	.0070
	(.0051)	(.0050)	(.0045)	(.0045)
Social Security Income	-.0033	-.0042	-.0035	-.0035
	(.0034)	(.0032)	(.0080)	(.0080)
Fully Retirement	-.0023	-.0026	-.0020	-.0020
	(.0023)	(.0033)	(.0050)	(.0050)
Year Effect & Cohort Effect	Yes	Yes	Yes	Yes
Group Specific Age Trend	No	Yes	No	Yes

Note: Source: HRS 1992-2010. N=57,480. Age Range is 60 to 70. Individuals in the sample are either married or divorced. *, ** and *** indicate significance at 10%, 5%, and 1% respectively. Estimates are using the assumption with probabilities assigned for the age of divorce. Standard errors for OLS regressions are robust, clustered by age and are shown in parentheses. For Specification for two-step estimator, the estimates for the first five key independent variables are reported from the second step, and all others estimates are reported from the first step.

Table 3: Estimates of the Difference of the First Step Coefficients for All Ages

The Difference of the First Step Coefficients	(1) X= 58	(2) X= 59	(3) X= 60	(4) X= 61	(5) X= 62	(6) X= 63	(7) X= 64
Age X Dummy	.0197	-.01795	-.0262	-.0412	-.0083	-.0020	.0182
	.0368	.0343	.0323	.0300	.0326	.0334	.0343
Post Age 65 Dummy	-.0130	-.0043	-.0060	-.0101	-.0089	-.0079	.0003
	.0335	.0323	.0313	.0296	.0327	.0338	.0349
Age Trend	.0086*	.0066	.0067	.0071*	.0075*	.0074*	.0066
	.0045	.0042	.0039	.0036	.0040	.0040	.0042
Adjusted R Squared	.3912	.3904	.4123	.0473	.0777	.3739	.3910
Number of Observations	14	14	14	14	14	14	14

The Difference of the First Step Coefficients	(8) X= 65	(9) X= 66	(10) X= 67	(11) X= 68	(12) X= 69	(13) X= 70	(14) X= 71
Age X Dummy	.0799***	.0443	.0345	-.0112	-.0037	-.0319	-.0424
	.0254	.0312	.0311	.0333	.0335	.0327	.0332
Post Age 65 Dummy	.0353	-.0323	-.0200	-.0048	-.0069	-.0077	-.0128
	.0280	.0318	.0323	.0329	.0324	.0308	.0302
Age Trend	.0027	.0097**	.0083*	.0073*	.0074*	.0082*	.0092**
	.0033	.0037	.0038	.0039	.0040	.0039	.0039
Adjusted R Squared	.6582	.5169	.4459	.3806	.3745	.4282	.4617
Number of Observations	14	14	14	14	14	14	14

Note : Source: HRS 1992-2010. Individuals in the sample are either married or divorced. Spousal coverage dependence group refers to individuals who or whose spouses have a single source of health insurance from the spouse's ESI coverage. *, ** and *** indicate significance at 10%, 5%, and 1% respectively. "The first-step coefficient for dependent group" is the estimated coefficient of the interaction terms between treatment group (ESI Coverage Dependence Group) dummy and age (the older age of the spouses) by using the two-step estimation method; "The first-step coefficient for nondependent group" is defined similarly for the control group without such ESI coverage dependence. And the "difference in the first step coefficients for dependent and nondependent group" refers to the difference of the first-step coefficients estimates for the two groups, which is the dependent variables in the regressions. Independent variables include a age trend, an age dummy for age X (X=58, 59,…,71), and a post-65 dummy. Specification 8 including a dummy for age 65 is the key regression, and all other specifications are placebo tests for other ages.

Table 4: Triple Difference Estimates of Divorce Rate for Medicare Eligibility (Age>=65)

Whether the Individual Is Recently Divorced	OLS		Two Step Estimator	
	(1)	(2)	(3)	(4)
Either Spouse's Medicare	-.0027	-.0028	-.0029	-.0029
Eligibility (Age >=65)	(.0156)	(.0149)	(.0145)	(.0143)
Spousal Coverage Dependence Group	-.0062*	-.0062**	-.0065	-.0076
	(.0034)	(.0021)	(.0091)	(.0129)
Having Neither Medicaid nor Medicare before	.0684***	.0746***	.0791***	.0741***
Age 65	(.0162)	(.0154)	(.0120)	(.0124)
Spousal Coverage Dependence* Either Spouse's	.0761***	.0631***	.0766***	.0567**
(Age >=65)* Having No Medicaid or Medicare	(.0104)	(.0082)	(.0182)	(.0228)
Personal Income	3.73e-07***	3.79e-07***	3.75e-07***	3.75e-07***
	(1.04e-07)	(1.01e-07)	(8.10e-08)	(8.10e-08)
Family Income	-1.75e-07**	-1.68e-07**	-1.75e-07**	-1.75e-07**
	(6.62e-08)	(6.26e-08)	(2. 61e-08)	(2. 61e-08)
Education Level	.0015	.0017*	.0015	.0015
	(.0009)	(.0009)	(.0010)	(.0010)
Self-Reported Health Status	.0042	.0040	.0044*	.0044*
	(.0025)	(.0025)	(.0026)	(.0026)
Gender	.0456***	.0425***	.0449***	.0449***
	(.0061)	(.0060)	(.0059)	(.0059)
Race	-.0029	-.0022	-.0032	-.0032
	(.0075)	(.0074)	(.0053)	(.0053)
Disability	.0281**	.0284**	.0269*	.0269*
	(.0093)	(.0093)	(.0097)	(.0097)
Years Married	-.0064***	-.0061***	-.0064***	-.0064***
	(.0002)	(.0002)	(.0002)	(.0002)
Times Married	-.0115*	-.0090	-.0113***	-.0113***
	(.0005)	(.0051)	(.0038)	(.0038)
Number of Children	-.0079***	-.0079***	-.0078***	-.0078***
	(.0005)	(.0005)	(.0013)	(.0013)
Post-Retirement ESI	-.0015	-.0014	-.0012	-.0012
	(.0064)	(.0065)	(.0062)	(.0062)
Age	-.0074***	-.0073***	-.0071***	-.0085***
	(.0016)	(.0016)	(.0016)	(.0019)
Retirement	.0073	.0076	.0076*	.0076*
	(.0049)	(.0048)	(.0045)	(.0045)
Social Security Income	-.0019	-.0028	-.0019	-.0019
	(.0037)	(.0035)	(.0080)	(.0080)
Fully Retirement	-.0023	-.0024	-.0022	-.0022
	(.0023)	(.0025)	.(0039)	.(0039)
Year Effect & Cohort Effect	Yes	Yes	Yes	Yes
Group Specific Age Trend	No	Yes	No	Yes

Note: Source: HRS 1992-2010. N=57,480. Age Range is 60 to 70. Individuals in the sample are either married or divorced. *, ** and *** indicate significance at 10%, 5%, and 1% respectively. Estimates are using the assumption with probabilities assigned for the age of divorce. Standard errors for OLS regressions are robust, clustered by age and are shown in parentheses. All specifications also include controls for interaction terms among Having Neither Medicaid nor Medicare before Age 65 group dummy, Spousal Coverage Dependence Group dummy, and Either Spouse' Medicare Eligibility age dummy. For Specification for two-step estimator, the estimates for the first four key independent variables are reported from the second step, and all others estimates are reported from the first step.

Table 5: Triple Difference Estimates of Divorce Rate for Medicare Eligibility (Age=65) and (Age>=66)

Whether the Individual Is Recently Divorced	OLS		Two Step Estimator	
	(1)	(2)	(3)	(4)
Either Spouse's Medicare	-.0111	-.0122	-.0027	-.0083
Eligibility (Age =65)	(.0205)	(.0193)	(.0147)	(.0145)
Either Spouse's Medicare	-.0095	-.0097	-.0069	-.0071
Eligibility (Age >=66)	(.0152)	(.0147)	(.0169)	(.0167)
Spousal Coverage Dependence	-.0221*	-.0267*	-.0212	-.0194
	(.0121)	(.0136)	(.0137)	(.0135)
Having Neither Medicaid nor Medicare before	.0683***	.0745***	.0800***	.0746***
Age 65	(.0161)	(.0153)	(.0123)	(.0127)
Spousal Coverage Dependence* Either Spouse's	.0871***	.0796***	.0889**	.0764**
(Age =65)* Having No Medicaid nor Medicare	(.0158)	(.0145)	(.0375)	(.0379)
Spousal Coverage Dependence* Either Spouse's	.0710***	.0599***	.0745***	.0512**
(Age >=66)* Having No Medicaid nor Medicare	(.0098)	(.0076)	(.0195)	(.0248)
Personal Income	3.73e-07***	3.79e-07***	3.75e-07***	3.75e-07***
	(1.04e-07)	(1.01e-07)	(8.10e-08)	(8.10e-08)
Family Income	-1.75e-07**	-1.68e-07**	-1.75e-07**	-1.75e-07**
	(6.62e-08)	(6.26e-08)	(2. 61e-08)	(2. 61e-08)
Education Level	.0015	.0017	.0015	.0015
	(.0019)	(.0009)	(.0010)	(.0010)
Self-Reported Health Status	.0043	.0040	.0044*	.0044*
	(.0026)	(.0025)	(.0026)	(.0026)
Gender	.0456***	.0426***	.0449***	.0449***
	(.0060)	(.0059)	(.0059)	(.0059)
Race	-.0029	-.0022	-.0032	-.0032
	(.0075)	(.0074)	(.0053)	(.0053)
Disability	.0281**	.0283**	.0269*	.0269*
	(.0094)	(.0093)	(.0097)	(.0097)
Years Married	-.0064***	-.0061***	-.0064***	-.0064***
	(.0002)	(.0002)	(.0002)	(.0002)
Times Married	-.0115**	-.0090	-.0113***	-.0113***
	(.0053)	(.0051)	(.0038)	(.0038)
Number of Children	-.0080***	-.0079***	-.0078***	-.0078***
	(.0005)	(.0005)	(.0013)	(.0013)
Post-Retirement ESI	-.0016	-.0014	-.0012	-.0012
	(.0064)	(.0064)	(.0062)	(.0062)
Age	-.0075***	-.0073***	-.0076***	-.0092***
	(.0016)	(.0016)	(.0019)	(.0021)
Retirement	.0073	.0075	.0076*	.0076*
	(.0049)	(.0048)	(.0045)	(.0045)
Social Security Income	-.0018	-.0027	-.0019	-.0019
	(.0037)	(.0035)	(.0080)	(.0080)
Fully Retirement	-.0023	-.0025	-.0026	-.0026
	(.0024)	(.0026)	.(0049)	.(0049)
Year Effect & Cohort Effect	Yes	Yes	Yes	Yes
Group Specific Age Trend	No	Yes	No	Yes

Note: Source: HRS 1992-2010. N=57,480. Age Range is 60 to 70. Individuals in the sample are either married or divorced. *, ** and *** indicate significance at 10%, 5%, and 1% respectively. Estimates are using the assumption with probabilities assigned for the age of divorce. Standard errors for OLS regressions are robust, clustered by age and are shown in parentheses. All specifications also include controls for interaction terms among Having Neither Medicaid nor Medicare before Age 65 group dummy, Spousal Coverage Dependence Group dummy, and Either Spouse' Medicare Eligibility age dummies. For Specification for two-step estimator, the estimates for the first six key independent variables are reported from the second step, and all others estimates are reported from the first step.

Table 6: Simulation Results of Regression Discontinuity Estimates for Medicare Eligibility

Panel A: Either Spouse' Medicare	Diff-in-Diff (OLS)		Diff-in-Diff (2-Step)		Triple Diff (OLS)		Triple Diff (2-Step)	
Eligibility (Age>=65)	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
Coef. for Key Interaction Term (Age>=65)	.0672	.0014	.0651	.0013	.0588	.0012	.0514	.0012
Std. Err. for Key Interaction Term (Age>=65)	.0071	.0004	.0280	.0081	.0077	.0004	.0215	.0014
Group Specific Age Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Either Spouse' Medicare	Diff-in-Diff (OLS)		Diff-in-Diff (2-Step)		Triple Diff (OLS)		Triple Diff (2-Step)	
Eligibility (Age=65) & (Age>=66)	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
Coef. for Key Interaction Term (Age=65)	.0718	.0035	.0735	.0031	.0778	.0036	.0732	.0032
Std. Err. for Key Interaction Term (Age=65)	.0095	.0012	.0245	.0076	.0092	.0012	.0314	.0047
Coef. for Key Interaction Term (Age>=66)	.0612	.0012	.0603	.0018	.0567	.0012	.0496	.0048
Std. Err. for Key Interaction Term (Age>=66)	.0066	.0004	.0512	.0094	.0064	.0004	.0229	.0038
Group Specific Age Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Source: HRS 1992-2010. N=57,480. Simulation Times: 10,000. Age Range is 60 to 70. Individuals in the sample are either married or divorced. Standard errors for OLS regressions are robust and clustered by age. The regressions are based on the assumption that people could get divorced in the full past year with probability 0.5, in the current interview year with probability 0.25, or in two years before the interview year with probability 0.25.The dependent variable is a dummy variable which equals to 1 if the individual got divorced recently between the interview waves, for all regressions; the main independent variables are the interaction terms among Having Neither Medicaid nor Medicare before Age 65 group dummy, Spousal Coverage Dependence Group dummy, and Either Spouse' Medicare Eligibility age dummies, with coefficients and standard errors reported in the table. Other important control variables include age, income, education, gender, race, disability, years married, times married, number of children, health status, retirement, private health insurance coverage, social security benefits and full retirement. All regressions control for year and region fixed effects, as well as spousal coverage group specific age trend.

Table 7: Difference in Difference Estimates of Divorce Rates under the 2006 Massachusetts Health Care Reform

Whether the Individual is Divorced	OLS			Two-Step Estimator	
	(1)	(2)	(3)	(4)	(5)
Treat Group (MA Residency)	.0104**	.0102**	.0104***	.0104***	.0036
	(.0004)	(.0003)	(.0019)	(.0025)	(.0029)
Post Year (Year >-2006)	.0023***	.1045**	.0925**	.0046***	.0037*
	(.0001)	(.0041)	(.0036)	(.0013)	(.0018)
Treat Group* Post Year	-.0039**	-.0069**	-.0042***	-.0046**	-.0037
(MA Residency) * (Year>=2006)	(.0002)	(.0003)	(.0027)	(.0019)	(.0040)
Personal Income	6.64e-08***	.6.46e-08***	5.78e-08***	4.66e-07***	4.77e-08***
	(9.19e-10)	(9.43e-10)	(4.98e-09)	(5.91e-09)	(4.97e-09)
Education Level	-.0037*	-.0037*	-.0039***	-.0029***	-.0039***
	(.0006)	(.0006)	(.0001)	(.0002)	(.0001)
Gender	.0290**	.0290*	.0289***	.0440***	.0305***
	(.0009)	(.0009)	(.0006)	(.0007)	(.0006)
Race	.0042***	.0010	-.0011***	.0042***	.0008***
	(.0002)	(.0004)	(.0002)	(.0002)	(.0002)
Disability	.0045	.1944**	.0136***	.0045***	.0108***
	(.0014)	(.0069)	(.0013)	(.0014)	(.0013)
Employment	-.0250	-.0220	.0236***	-.0250***	.0276***
	(.0008)	(.0052)	(.0007)	(.0008)	(.0007)
Employer Sponsored Health Insurance	-.0836***	-.0061***	-.0064***	-.0836***	-.0248***
	(.0014)	(.0006)	(.0010)	(.0015)	(.0011)
Citizenship	-.0252***	-.0059	-.0074***	-.0252***	-.0050***
	(.0012)	(.0022)	(.0010)	(.0011)	(.0010)
Number of Children	-.0673***	-.0097***	-.0095***	-.0673***	-.0086***
	(.0003)	(.0001)	(.0003)	(.0003)	(.0003)
Age	.0062***	.0047**	.0047***	.0062***	.0049***
	(.0001)	(.0003)	(.0001)	(.0001)	(.0001)
Year Effect	Yes	Yes	Yes	Yes	Yes
State-Specific Time Trend	No	Yes	Yes	No	No
Connecticut Added to Control Group	No	No	Yes	No	Yes

Note: Source: ACS 2001-2011. N=760,156. Age Range: 20 - 64. *, ** and *** indicate significance at 10%, 5%, and 1% respectively. Standard errors for OLS regressions are robust, clustered by state and are shown in parentheses. The dependent variable in is a dummy variable which equals to 1 if the individual is being divorced. For Specification for two-step estimator, the estimates for the first three key independent variables are reported from the second step, and all others estimates are reported from the first step.

Table 8: Difference in Difference Estimates of Marriage Rates under the 2006 Massachusetts Health Care Reform

Whether the Individual is Married	OLS			Two-Step Estimator	
	(1)	(2)	(3)	(4)	(5)
Treat Group (MA Residency)	-.0205***	-.0174***	.0184***	-.0215***	.0152**
	(.0001)	(.0001)	(.0011)	(.0051)	(.0032)
Post Year (Year >-2006)	-.0282***	-.2345**	-.2336***	-.2170**	-.0242***
	(.0004)	(.0057)	(.0025)	(.0033)	(.0031)
Treat Group* Post Year	.0133**	.0150**	.0124***	.0145**	.0124***
(MA Residency) * (Year>=2006)	(.0004)	(.0006)	(.0014)	(.0069)	(.0044)
Personal Income	4.66e-07***	4.66e-07***	4.62e-07***	4.66e-07***	4.63e-07***
	(6.34e-09)	(6.31e-09)	(5.06e-09)	(5.91e-09)	(5.06e-09)
Education Level	.0029	.0029	.0032***	.0029***	.0032***
	.0008	(.0008)	(.0002)	(.0002)	(.0001)
Gender	-.0440*	-.0440*	-.0431***	-.0440***	-.0431***
	(.0070)	(.0070)	(.0006)	(.0007)	(.0007)
Race	.0042*	.0042*	.0040***	.0042***	.0040***
	(.0005)	(.0005)	(.0002)	(.0002)	(.0002)
Disability	-.0045	-.0045	-.0030**	-.0045***	.0030**
	(.0039)	(.0039)	(.0013)	(.0014)	(.0013)
Employment	.0250**	.0250**	.0254**	.0250***	-.0253***
	(.0020)	(.0021)	(.0007)	(.0008)	(.0007)
Employer Sponsored Health Insurance	.0831*	.0836*	.0854***	.0836***	.0855***
	(.0084)	(.0084)	(.0014)	(.0015)	(.0014)
Citizenship	.0251**	.0252**	.0267***	.0252***	.0264***
	(.0012)	(.0018)	(.0011)	(.0012)	(.0011)
Number of Children	.0673***	.0673***	.0668***	.0673***	.0667***
	(.0001)	(.0001)	(.0003)	(.0003)	(.0003)
Age	.0062**	.0062**	.0062***	.0062***	.0070***
	(.0002)	(.0002)	(.0001)	(.0001)	(.0001)
Year Effect	Yes	Yes	Yes	Yes	Yes
State-Specific Time Trend	No	Yes	Yes	No	No
Connecticut Added to Control Group	No	No	Yes	No	Yes

Note: Source: ACS 2001-2011. N=760,156. Age Range: 20 - 64. *, ** and *** indicate significance at 10%, 5%, and 1% respectively. Standard errors for OLS regressions are robust, clustered by state and are shown in parentheses. The dependent variable in is a dummy variable which equals to 1 if the individual is being married. For Specification for two-step estimator, the estimates for the first three key independent variables are reported from the second step, and all others estimates are reported from the first step.

Table 9: Estimates for Marriage Behavior by Income Penalty Groups under the 2006 Massachusetts Health Care Reform

9a: Main Effects of The Health Care Reform on Divorce	OLS		Two-Step Estimator
	(1)	(2)	(3)
Below 150% FPL	-.0101**	-.0134**	-.0075
	(.0043)	(.0063)	(.0084)
150 -300% FPL	-.0091***	-.0147***	-.0136**
	(.0036)	(.0058)	(.0081)
Above 300% FPL	-.0029	-.0051	-.0029
	(.0022)	(.0052)	(.0058)
Year Effect	Yes	Yes	Yes
State-Specific Time Trend	No	Yes	No

9b: Main Effects of The Health Care Reform on Marriage	OLS		Two-Step Estimator
	(1)	(2)	(3)
Below 150% FPL	.0094*	.0102	.0098
	(.0068)	(.0089)	(.0105)
150 -300% FPL	.0229***	.0234***	.0268**
	(.0117)	(.0135)	(.0153)
Above 300% FPL	.0067**	.0084*	.0073
	(.0037)	(.0063)	(.0111)
Year Effect	Yes	Yes	Yes
State-Specific Time Trend	No	Yes	No

Note: Source: ACS 2001-2011. N=760,156. Age Range: 20 - 64. *, ** and *** indicate significance at 10%, 5%, and 1% respectively. Standard errors for OLS regressions are robust, clustered by state and are shown in parentheses. The dependent variable in divorce estimation is a dummy variable which equals to 1 if the individual is being divorced, and the dependent variable in marriage estimation is a dummy variable which equals to 1 if the individual is being married; the main independent variables includes Massachusetts residency dummy, post 2006 dummy, income penalty group dummy and their interaction terms. The coefficients on interaction terms among Massachusetts residency dummy, post 2006 dummy, and income penalty group dummy are indicated on the row label as the main effects. All specifications include controls for age, income, education, gender, race, disability, years married, times married, number of children, health insurance coverage, and other interaction terms for triple difference estimation.

Table 10: Difference in Difference in Difference Estimates for Marriage Behavior by Age Groups under the 2006 Massachusetts Health Care Reform

10a: Main Effects of The Health Care Reform on Divorce	OLS		Two-Step Estimator
	(1)	(2)	(3)
Age 20 -29	-.0036*	-.0059	-.0044
	(.0006)	(.0040)	(.0027)
Age 30 -39	-.0028***	-.0062*	-.0024
	(.0001)	(.0037)	(.0016)
Age 40 -49	-.0016**	-.0052	-.0016
	(.0001)	(.0035)	(.0016)
Age 50-64	-.0053**	-.0087***	-.0059**
	(.0003)	(.0033)	(.0029)
Year Effect	Yes	Yes	Yes
State-Specific Time Trend	No	Yes	No

10b: Main Effects of The Health Care Reform on Marriage	OLS		Two-Step Estimator
	(1)	(2)	(3)
Age 20 -29	.0178***	.0183***	.0180**
	(.0035)	(.0045)	(.0096)
Age 30 -39	.0129***	.0135***	.0121
	(.0031)	(.0042)	(.0088)
Age 40 -49	.0082***	.0090**	.0068
	(.0028)	(.0040)	(.0054)
Age 50-64	.0141***	.0146***	.0153**
	(.0026)	(.0039)	(.0080)
Year Effect	Yes	Yes	Yes
State-Specific Time Trend	No	Yes	No

Note: Source: ACS 2001-2011. N=760,156. Age Range: 20 - 64. *, ** and *** indicate significance at 10%, 5%, and 1% respectively. Standard errors for OLS regressions are robust, clustered by state and are shown in parentheses. The dependent variable in divorce estimation is a dummy variable which equals to 1 if the individual is being divorced, and the dependent variable in marriage estimation is a dummy variable which equals to 1 if the individual is being married; the main independent variables includes Massachusetts residency dummy, post 2006 dummy, income penalty group dummy and their interaction terms. The coefficients on interaction terms among Massachusetts residency dummy, post 2006 dummy, and age group dummy are indicated on the row label as the main effects. All specifications include controls for age, income, education, gender, race, disability, years married, times married, number of children, health insurance coverage, and other interaction terms for triple difference estimation.

Table 11: Difference in Difference Estimates of Marriage Behavior for People Aged 65 and Older between Massachusetts and New Jersey

11a: Main Effects of The Health Care Reform on Divorce	OLS		Two-Step Estimator
	(1)	(2)	(3)
Treat Group (MA Residency)	.0077***	.0080**	.0078**
	(.0016)	(.0034)	(.0024)
Post Year (>=2006)	.0176***	.1061***	.0174*
	(.0051)	(.0039)	(.0079)
Treat Group* Post Year	-.0008	-.0012	-.0010
(MA Residency) * (>=2006)	(.0022)	(.0038)	(.0039)
Year Effect	Yes	Yes	Yes
State-Specific Time Trend	No	Yes	Yes

11b: Main Effects of The Health Care Reform on Marriage	OLS		Two-Step Estimator
	(1)	(2)	(3)
Treat Group (MA Residency)	-.0130***	-.0130***	-.0132**
	(.0024)	(.0034)	(.0055)
Post Year (>=2006)	-.3308***	-.3333***	-.3327***
	(.0127)	(.0159)	(.0197)
Treat Group* Post Year	.0071**	.0072*	.0070
(MA Residency) * (>=2006)	(.0026)	(.0040)	(.0044)
Year Effect	Yes	Yes	Yes
State-Specific Time Trend	No	Yes	Yes

Note: Source: ACS 2001-2011. N= 197,644. Age Range: 65 and up. *, ** and *** indicate significance at 10%, 5%, and 1% respectively. Standard errors for OLS regressions are robust, clustered by state and are shown in parentheses. The dependent variable in divorce estimation is a dummy variable which equals to 1 if the individual is being divorced, and the dependent variable in marriage estimation is a dummy variable which equals to 1 if the individual is being married. All specifications include controls for age, income, education, gender, race, disability, years married, times married, number of children, and health insurance coverage.

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