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Love, Toil, and Health Insurance: Why American Husbands Retire When They Do

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Abstract

Health insurance has previously been shown to be an important determinant of retirement timing among older Americans. While previous literature has largely ignored the inter-spousal dependence of health insurance benefits, this study examines the relationship of both spouses' health insurance options to the household's timing of the husband's retirement. Using data from the Health and Retirement Study, I find that a wife's health insurance options have an independent impact on the timing of her husband's exit from the labor force. This impact is not distinguishable in magnitude to that of a husband's own health insurance options. Differences for each spouse do arise when each spouse's health is interacted with his or her health insurance options following a husband's retirement. The impact of a wife's health insurance needs on the timing of a husband's retirement is dependent on her health while the impact of the husband's insurance options is seemingly unrelated to his health. The omission of inter-spousal health insurance dependency may lead to an underestimation of the cost and the employment response to changes in the health insurance system from newly legislated health care reform.

JEL Classification Codes: H55, J26, J32, J44

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1 Introduction

Research on the role of employer provided health insurance (EPHI) and retiree health insurance (RHI) in labor force participation decisions has been quite extensive over the past fifteen years. Much of this research has focused only on offers of EPHI from men's employers. To the extent that the health insurance benefits of wives are considered, it is usually limited to whether EPHI from wives' employers could cover husbands if the husbands retire. The inter-spousal dependence on EPHI has not yet been fully considered despite the fact that in most working couples, each spouse has health insurance through the same employer's plan since most group health plans are available to both spouses in a household.[1] Unlike most group health insurance plans that employers might offer to their current and former employees, the federal government's health insurance program for older Americans, Medicare, requires that each spouse be of the minimum age (currently 65) to be eligible for this benefit. Based on the fact that wives are on average two to three years younger than their husbands, the rules of Medicare imply that a large share of wives do not qualify for Medicare at the same time as their husbands.[2] By including only the health insurance conditions for husbands, previous literature may be omitting any response by households to the wives' health insurance concerns when the husband is Medicare eligible but the wife is not.[3] This paper looks to account for this inter-spousal health insurance dependence and to examine the relative size of the influence of each spouse's health insurance needs on the timing of husbands' retirements using extensive data from the Health and Retirement Study (HRS).[4]

[1] In near-retirement aged households where the husband is working and both spouses report employer provided health insurance (EPHI), over 87 percent of spouses are on the same plan. Sixty-nine percent of households have a plan through the husband's employer and 18 percent through the wife's. Percentages are based on the author's calculations using the 1992 wave of the Health and Retirement Study.

[2] For a distribution of the gap in ages between spouses in the Health and Retirement Study, see Appendix Figure 1.

[3] Appendix Section A presents a basic theoretical example of the problem facing the household and what is missing from previous work on this topic.

[4] Though the HRS is the richest dataset for Americans in this age range currently available, the number of respondents does not allow for a parallel analysis of the relationship of spousal health insurance and the retirement of women due to the small share of women who receive health insurance from their own employers and even fewer whose husbands also rely on that insurance.

Under the current health care system in the United States, near retirement-aged Americans face very high insurance premium rates and limitations of coverage if they do not have employer provided health insurance from a current or former employer. The 2010 health care overhaul legislation, the Patient Protection and Affordable Care Act (PPACA), was designed to address both the cost and availability to all Americans but especially those who are nearing Medicare eligibility age. Lower cost health insurance alternatives could affect retirement timing and would therefore have fiscal implications in the United States. First, retiring individuals are generally replaced by lower income employees which will negatively effect income tax revenue for the federal government. Second, the financial outlook for the Social Security program is closely linked to the expected rates that individuals move from payers to receivers.[5] In recent years, the full benefit eligibility age of Social Security benefits has been increased to encourage delayed retirement. No similar changes have been made to the Medicare qualifications, but this may change in the near future as the date of projected insolvency of that program nears. The projected impact of the new health care legislation could be substantially different depending on whether the needs of younger spouses are considering. The legislations goal of making the private, non-group health insurance markets more accessible and affordable could have implications as households are given access to less expensive alternatives to EPHI. Such changes, if successful, would have fiscal implications for Social Security and general tax revenue that may be underestimated based on the methodology of previous research, especially given the declining rate that employers are offering RHI to their potential retirees.

Previous research has consistently found a link between health insurance offers by employers and various labor decisions, including retirement. Papers by Madrian (1994), Karoly

[5]Though Social Security benefits are designed to have actuarially fair benefit adjustments for those who retire before or after the normal retirement age, Coile and Gruber (2001) found that there is a small benefit disincentive to working between the ages of 55 and 61 and a large benefit penalty to working between the ages of 65 and 69 for the median male worker. The only benefit reductions for the median male worker that were found to be actuarially fair were for those between 62 and 64 but even those where unfair to almost half of individuals at age 62. Therefore, delays in retirement should improve the fiscal outlook of the Social Security program.

and Rogowski (1994), Gruber and Madrian (1995) and later, Blau and Gilleskie (2001) all found a strong link between men's RHI and their retirement hazard using reduced-form analyses, but none tested the impact of possible changes to wives' health insurance status (see Gruber and Madrian (2002) for a thorough review of the literature and findings). Similarly, a number of papers that use structural models to analyze retirement decisions have all incorporated individuals' health insurance, but not that of their spouses if they retire.[6] Recent extensions in this literature examining the the frequency of "joint" or coordinated retirement within dual-earning households by Blau and Gilleskie (2006) and Kapur and Rogowski (2007) also do not account for the influence of spouses' health insurance needs on each individual's decision to retire. [7]

One previous study has addressed the effect of inter-spousal health insurance dependency. In trying to isolate the affect of Medicare on mens' retirement, Madrian and Beaulieu (1998) use the difference in ages between spouses to proxy for differences in health insurance availability upon retirements. Madrian and Beaulieu (1998) found an increase in the retirement hazard of 55 to 69 year old men with Medicare eligible wives compared to those whose wives are not Medicare eligible. Because the Census data used in this study did not include health insurance data, it was unable to identify the size of this influence or compare it to that of the husband's health insurance options because they cannot separately identify those who are constrained by the Medicare qualification age (i.e. those without RHI) and those who are unconstrained. The wealth of detailed data in the HRS allows for the estimation of the impact of cross-spouse health insurance dependency while also controlling for factors other than age that may influence the decision to retire.

In the analysis that follows, I present evidence that a strong relationship exists between wives' health insurance needs and the timing of husbands' retirements, even independently of

[6]Most prominently, the studies using structural models to identify the role of health insurance in the decision to retire include Gustman and Steinmeier (1994), Lumsdaine, Stock and Wise (1994), Rust and Phelan (1997), and French and Jones (2011).

[7]Kapur and Rogowski (2007) do find that the propensity of simultaneous retirements more than doubles if wives possess RHI, which suggests an important role for health insurance in the timing of retirement within households.

husbands' own health insurance concerns. Consistent with previous research, I find that the retirement rate for husbands who would lose their health insurance source upon retirement (regardless of whether their wives would as well) is six to nine percentage points lower than for those who would not. Not examined in previous research is a similar decline of five percentage points in the rate of husbands' retirement in households where the wife, but not the husband, would lose her current health insurance source without having an affordable alternative. These marginal effects represent a 30 to 45 percent decline in retirement rates and are not statistically different from each other. Interestingly, the impact for the wife is dependent on her self-reported health while that for the husband is not. Specifically, the impact of health insurance concerns on a husband's rate of retirement is significantly negative if the wife's health is rated as poor but not if the husband's health is similarly rated.

Section 2 discusses the health insurance options and current trends for near-retirement married couples in the United States. Section 3 describes the Health and Retirement Study, the sample used, and definitions of key elements for the analysis that follows. Section 4 discusses the general methodology used and addresses some concerns raised in previous literature. Section 5 presents the main results and a summary of outcomes following a husband's retirement. Section 6 concludes.

2 Health Insurance and Retirement: Background

Health insurance provision for working age Americans is centered around EPHI. The majority of workers receive health insurance from either their own or their spouses' employers. When Americans reach 65 years of age, they become eligible for the federal government's health insurance program, called Medicare, as long as they have worked ten years in a qualifying job (which most do). As previously mentioned, one spouse becoming eligible for Medicare does not mean that the other spouse is also eligible. Medicare is available prior to age 65 only for those with qualifying disabilities. If workers choose to retire before they reach 65 years of

age, they have a number possible outcomes. For some, their employers offer to continue to provide health insurance to retirees who have worked for the employer for a certain number of years. I refer to this as an offer of retiree health insurance (RHI). The level of premium subsidization depends on the employer's specific benefits but, in general, these programs are retirees' least expensive option due to the risk pooling over all of an employer's employees. Under most RHI plans, spouses of retirees can also be covered, though again, with different levels of subsidization. If they do not have an offer of RHI, they may remain on their former employer's health insurance plan for 18 months following separation of employment but they will pay the full cost of the insurance (plus a two percent administration fee). This is commonly referred to as "COBRA" benefits (after the federal Consolidated Omnibus Budget Reconciliation Act of 1985 which granted this benefit). The availability of EPHI and RHI has declined in recent decades as fewer employers are offering these benefits to their employees. According to a 2007 survey of employers, the percentage of employers offering EPHI is down from 69 percent in 2000 to 60 percent in 2007 (Kaiser Family Foundation and Health Research and Education Trust 2007). Similarly, a larger study using Medical Expenditure Panel Survey (MEPS) found that only one-quarter of private-sector employees were working at firms that offered retiree health benefits in 2003 compared to 32 percent in 1997 (Buchmueller, Johnson and Lo Sasso 2006).

Private, non-group health insurance is one alternative to employer-provided health insurance. It is hard to estimate the average cost of such plans because of the high variability in the terms of each policy but they tend to be more expensive than employer-provided health plans and have higher deductibles and co-payments for services. Until recently, insurance companies in most states retained the option to deny coverage to individuals whom they deem too risky or limit benefits for pre-existing conditions. Examination of insurance companies' offer rates have found that companies reject 10 to 14 percent of all applicants (Pauly and Nichols 2002 Merlis 2005) and up to 37 percent of those with pre-existing conditions (Pollitz, Sorian and Thomas 2001). The PPACA will address the problem of accessibility

and limited coverage by prohibiting health insurance companies from using previous health issues when evaluating an application and by standardizing coverage in the newly established health insurance "Exchanges" (Democratic Policy Committee 2009).

If near-retirement aged individuals choose to go without insurance, they are facing higher medical costs on average than younger Americans, with much higher variability. Tabulations from the MEPS show the 2005 mean medical expenditure for individuals between 55 and 64 years of age to be over fifty percent higher than for individuals between the ages of 45 and 54 at $5923 and $3775, respectively.[8] Under the PPACA, those who choose to go uninsured may also face a financial penalty. The penalty for not maintaining "minimum essential coverage" will start at $95 or one percent of income in 2014 and increase to $695 or 2.5 percent of income in 2016 with cost of living adjustments made after 2016 though exceptions are made for those who cannot afford coverage (Democratic Policy Committee 2009).

3 Data, Definitions, and Descriptive Analysis

The analysis that follows uses detailed longitudinal data on a nationally representative sample of American households from the Health and Retirement Study (HRS). The initial cohort of the HRS included households where at least one member was between the ages of 51 and 61 in 1992. A new cohort, labeled the War Baby Cohort, was added in 1998 and includes households in which one spouse was between the ages of 51 and 56 at the time of their first interview.[9] The HRS includes data from re-interviews that occur every two years, with the most recent interview "wave" included in this study occurring in 2006. The data used in this study is available from the Institute for Social Research at the University of Michigan and the RAND Center for the Study of Aging (see St. Clair (2008) for a description of the RAND data files).

[8] This calculation is similar to an earlier calculation by Gruber and Madrian (1996). MEPS data is available through the U.S. Department of Human Services' Agency for Healthcare Research and Quality at http://www.meps.ahrq.gov/mepsweb/index.jsp.

[9] An additional retirement age cohort was added in 2004 to examine the patterns of baby-boomers but there has not yet been enough data accumulated to include this cohort in the following analysis.

The sample from the HRS used in the following analysis will be restricted in a number of ways. There are 6,875 households represented in the HRS where at least one household member is age eligible for one of the two cohorts identified above. Those households are interviewed a total of 34,440 times. Table 1 itemizes the sample restrictions and the number of households and observations that remain after each. The sample is limited to only married couples in order to focus on the inter-dependence of health insurance. To focus on the act of retirement, the sample is further limited to only households were the husband is working and has not previously retired.[10] The latter restriction is based on the concern that jobs following a retirement reversal may not be similar to pre-retirement jobs and that those who have retired previously might have unobserved differences from those who are considering retirement for the first time. Those who are self-employed are also excluded due to the complicated relationship between benefits and employment when one is running his own business.

The final general restriction on the sample is that one of the spouses in each household must report health insurance from a current employer. This restriction is made in part to address endogeneity concerns in regard to employees selecting into jobs that provide health insurance due to a greater valuation of that benefit. The selection concern will be discussed further in Section 4 below. Ultimately, the analysis sample includes data from 3,044 independent households and 8,417 observations after a number of observations and households are lost due to data availability.

Past literature has used varying definitions of retirement (see Karoly and Rogowski (1994) for a discussion of various definitions). Following the methodology used in the RAND data files and many other studies, I will define full and partial retirement based on the hours and weeks worked by a respondent and their self-identified retirement status. Those who work full-time (defined as 35 hours or more per week and at least 36 weeks in the last year) will not be considered retired regardless of their self-designation. Those working part-time will

[10] Re-entry is quite common as shown by Maestas (2010) and Congdon-Hohman (2006).

be identified as partially retired if they self-identify as "retired" or simply part-time if they do not. Finally, anyone not working and reporting being retired will be considered "fully retired" while those not working and not identifying themselves as retired (the unemployed, disabled, and those not in the labor force but not retired) will be excluded from the sample. This study defines retirement as moving from a working, non-retired classification (full-time or part-time) to a retired labor force status (partial or full retirement).[11]

It is important to carefully categorize the health insurance circumstances of a couple and how I define expectations for health insurance provision if the husband were to retire. Since I am studying the link between health insurance and labor force transitions, it is important to identify alternative sources of insurance that may not be linked to continued employment. Affordable alternatives to EPHI from the husband's employer include RHI, Medicare, or EPHI through a wife's employer. Therefore, I will identify a husband as "at risk" of losing his low-cost health insurance upon retirement if he reports that his employer offers EPHI but does not offer RHI, his wife does not receive EPHI from her current or former employer, and he will be under 65 as of the next wave. Similarly, I will identify a wife as "at risk" if her current health insurance source is her husband's employer, that employer does not offer RHI, and she will be under 65 years of age at the time of the next wave.[12]

Table 2 lists the qualifications one must have to be classified as "at risk" and the percent of the examined sample that is potentially at risk based on each. Within the analysis sample described above, the age qualification only makes up a small part of the risk categorization as most respondents in the analysis sample are under 65 years of age (91 percent of men and 95 percent of women) and thus assumed to be ineligible for Medicare.[13] Amongst the

[11] A weakness of this definition is that an individual working part-time can change their classification to partially retired without changing their work level since the difference between the two categories is purely based on self-reported retirement status. The same is not true for a full-time worker since the definition does not allow a full-time worker to be classified as retired. The results are generally similar to the findings below using different definitions of retirement such as considering only "full-time work" as a non-retired status or full-retirement as the only retired status.

[12] The assumption that wives are eligible for RHI if the husband reports RHI is based on survey results that find this to be the case 91 percent of the time (Kaiser Family Foundation 2002).

[13] The use of 65 as the cutoff for defining risk is adjusted to incorporate the possibility that COBRA continuation benefits as an insurance bridge from the husband's retirement to their 65th birthday and

men, almost eighty percent identify their employer as their health insurance source with thirty percent not being offered retiree health coverage. Sixty-two percent of the men in the analysis sample do not report a spouse having EPHI from her own employer and thus not appearing to have her employer's insurance as an alternative to his own employer's (more on this in a moment). Overall, 20.2 percent of the men in the analysis sample are identified as at risk. The numbers are similar for women except that their risk is primarily determined by whether they rely on their husband's employer who offers health insurance only to current employees. About 21 percent of wives report health insurance through such a source and the final percentage of women deemed at risk is reduced slightly to about 20 percent when the 65 years of age restriction is added.

One weakness of the HRS is that it does not ask respondents whether they have declined EPHI from their employer. Therefore some individuals may be identified as "at risk" despite the fact that their wives' employers offer EPHI to their employees if those offers are not accepted. These occurrences should be relatively rare as prior research by Buchmueller and Valletta (1999) has shown that EPHI from a husband's employer makes it significantly less likely that a wife will seek out employment with the same benefit even when conditioning on full-time employment. Regardless, these instances of misclassification should bias our results toward zero since individuals who are not truly at risk of losing their health insurance upon retirement are classified as "at risk." If a wife's employer offers EPHI, past economic literature would suggest that a husband would be more likely to retire. Therefore, any real negative impact on retirement rates due to the risk of losing health insurance will be somewhat masked by those who are retiring at the same rate as those identified as "not at risk" due to the unaccounted for alternatives.

Though husbands and wives have similar rates of being categorized as "at risk," there is some variation within the household. The first column of Table 3 presents the rates that husbands and wives are identified as being "at risk." Though each spouse has similar

Medicare eligibility in Appendix Section C.

individual rates of risk (between 20 and 21 percent), the risk is only shared about 85 percent of the time. The husband is alone at risk and the wife is alone at risk within in the household in about three percent of the analysis sample each while 17.5 percent of the sample includes households where both spouses are at risk. The second column focuses on the rates of health insurance risk in the wave prior to a husband's retirement. Comparing all waves to only those immediately prior to a husband's retirement, the share of households where a husband is at risk diminishes more dramatically just before his retirement than do the share of households where a wife is at risk. The final column of Table 3 provides retirement rates by risk categorization when returning to the full analysis sample. The fact that the husband's retirement rate is relatively similar in households where the husband alone or both spouses may lose their health insurance if he retires but is much higher if only the wife is at risk suggests that a wife's health insurance circumstances have less influence than the husband's on the timing of a husband's retirement and may be in the opposite direction. I test in the analysis that follows whether this continues to be true when other demographic and household characteristics are taken into account.

Table 4 examines the relationship of the health insurance risk identifiers to other measured qualities. Though age is an important determinant of risk (since those over 65 years of age are defined to be not at risk due to their assumed eligibility for Medicaid), the table shows that there is a good portion of the households where both spouses or the husband alone are at risk up until the husband reaches age 65. It also shows that there are infrequent cases (about 1.5 percent) where the wife is alone at risk until the husband reaches 65. The pattern is similar as a wife ages but with more cases where the wife alone is at risk and fewer cases where the husband alone is at risk until the wife reaches age 65. When looking at the wife's retirement status, Table 4 shows that a similar portion of the households in the sample have both spouses at risk but more cases where just one spouse is at risk if she has already retired. If the husband reports a pension, the household is more likely to have both spouses at risk of losing their health insurance if the husband retires but less likely to have just one spouse

at risk. In terms of non-housing wealth, the bottom quartile of the wealth distribution has modestly more likelihood of all three risk categorizations but there is no clear pattern for those in the second, third and fourth quartiles.[14]

4 Empirical Methodology

Like much of the literature referenced earlier, this paper focuses on reduced form analysis to study the relationship of health insurance and retirement decisions. Though there is also a large literature that employs a structural approach to similar questions, I have opted for the reduced form approach primarily for its simplicity and clarity. Previous structural models are extremely complex without introducing the wife's insurance needs to the analysis. As Kapur and Rogowski (2007) stated in their analysis of joint retirement, the interpretive advantages of a reduced-form analysis outweigh the potential predictive gains available with a structural model, which I believe is particularly true when looking at a complex question like this one for the first time.

Though health insurance offers have been used extensively as an independent variable in prominent economic studies of labor force decisions, there is a question as to the appropriateness of using these offers in reduced-form studies due to concerns over its possible endogeneity. Specifically, endogeneity may be a concern if those with a preference for early retirement select into jobs that offer RHI. Additionally, RHI may be correlated with other, unobserved qualities of a job. Recently, a number of researchers have rejected the endogeneity concern when conditioning on offers of EPHI both on a practical basis and with specification checks. Kapur and Rogowski (2007) make three main arguments for not being concerned about the possible endogeneity of retiree health insurance. First, Gustman and Steinmeier (2001) and Schur, Berk, Wilensky and Gagnon (2004) provide evidence that individuals are not well informed about their retiree health benefit packages, which suggests a

[14] A more traditional comparison of means between households where the husband is at risk and where he is not at risk is available in Appendix Table 1.

lack of planning for early retirement. Second, most employers require ten years or more of tenure to qualify for RHI, which would require job changes prohibitively far in advance of an expected retirement. Third, retirement planning is difficult because retiree health insurance has been scaled back dramatically in the last two decades and thus, there is no guarantee that RHI will still be available when an individual retires. Unlike pensions which are insured through the federal government, no legal requirement or guarantee exists to maintain retiree health benefits offered before retirement. Additionally, Strumpf (2010) conducted a number of specification checks to support her use of RHI as an independent variable and found no evidence that RHI was endogenous conditional on offers of EPHI.[15] To address these concerns, I limit the sample studied to those households where at least one spouse receives EPHI from a current employer and include a specification using a number of job characteristics to control for job quality.

In the section that follows, I present the results from three parallel probit analyses with household-wave pairs as the observation level.[16] In the baseline specification (Specification 1), the only health insurance variable included is the husband's risk of losing low-cost coverage. With this specification, households where only the wife is at risk of losing her health insurance upon a husband's retirement are included with the control group along with households where neither spouse is at risk. This specification is consistent with the analyses done in previous research. The second specification (Specification 2) adds a control for whether the wife alone is at risk of losing her health insurance. This specification is meant to address the question of whether households include the wife's health insurance circumstances when deciding on the timing of the husband's retirement. Additionally, the control group is more logically limited to only those households where neither spouse is at risk of losing his or her health insurance if the husband retires. The third specification (Specification 3) separately identifies households where both spouses, only the husband, or only the wife may lose their low-cost health insurance, which allows me to examine the relative

[15] Strumpf's robustness checks included reanalysis on subsamples of those with over twelve years of tenure and those over four years from retirement when first observed.

[16] I cluster observations at the household level in order to report the correct standard errors.

importance of each spouse's risk. The following equations present the specifications more formally:

$$P\left(\mathrm{HR}|HI_{\mathrm{husb}}\right) = \Phi\left(\alpha_0 + \alpha_1 HI_{\mathrm{husb}} + \alpha_4 X + \alpha_5 W\right) \tag{1}$$

$$P\left(\mathrm{HR}|HI_{\mathrm{husb}}, HI_{\mathrm{w\ only}}\right) = \Phi\left(\beta_0 + \beta_1 HI_{\mathrm{husb}} + \beta_2 HI_{\mathrm{w\ only}} + \beta_4 X + \beta_5 W\right) \tag{2}$$

$$P\left(\mathrm{HR}|HI_{\mathrm{both}}, HI_{\mathrm{h\ only}}, HI_{\mathrm{w\ only}}\right) = \Phi\left(\gamma_0 + \gamma_1 HI_{\mathrm{both}} + \gamma_2 HI_{\mathrm{h\ only}} + \gamma_3 HI_{\mathrm{w\ only}} + \gamma_4 X + \gamma_5 W\right) \tag{3}$$

In these specifications, HR is an indicator for the husband's retirement before the next wave, HI_{husb} indicates whether the husband is "at risk" of losing his health insurance if he retires before the next wave (regardless of his wife's risk), $HI_{\mathrm{h\ only}}$ and $HI_{\mathrm{w\ only}}$ indicate that only the husband or only the wife is at risk, and HI_{both} indicates both spouses are at risk. The X variable represents additional factors that may be associated with a husband's decision to retire. Included in X are the wife's retirement status, each spouse's age, the household's non-housing wealth, and each spouse's level of educational attainment. Additionally, X includes indicators for whether the husband has a pension plan from his employer, whether each spouse is between 62 and 64 years of age or age 65 and older, and whether each spouse rates their health as poor or fair (on a five point scale).[17] W represents a series of dummy variables for each wave of the HRS and is included to capture any time trends in the dependent variable.[18] Additional specifications include other factors as control variables.

The results that follow are presented as mean marginal effects (MMEs) rather than probit coefficients or marginal effects at the mean. Mean marginal effects are simply the average of the calculated marginal effects of a change in the variable of interest (from zero to one if binary or a one unit change if continuous) for each individual in the sample if all other covariates are as reported. By contrast, marginal effects at the mean are the calculated

[17]Replacing the pension term with separate indicators for the type of pension plan (defined contribution, defined benefit, or both) results in slightly smaller estimates but do not change the findings. Those results are shown in Appendix Table 5.

[18]The mean marginal effects (MME's) for the wave indicators from the probit analysis are omitted in the tables below in order to save space. The MME's of the wave dummies are generally not significant at traditional levels.

marginal effects if all covariates are evaluated at their mean value. The marginal effects at specific valuations of the key independent variables are also provided for comparison purposes.

5 Estimation Results

Table 5 presents the results from the probit analyses outlined in the previous section. Columns 1 through 3 present the mean marginal effects (MMEs) when other covariates (the above X's) are excluded. The results in these columns reflect the surprising pattern from Table 3 that the MMEs of both spouses being at risk and the husband alone being at risk are of a similar magnitude, while the wife's sole risk is associated with a significant increase in the retirement rate. Again, in order to be classified as "at risk" of losing health insurance if the husband retires, a husband must report EPHI but not RHI, not have a wife with EPHI from her own employer, and be under 65 years of age in the next wave. For wives to be at risk, they must report their husbands' employer as their source of EPHI with no offer of RHI and be under 65.

Column 4 through 6 of Table 5 duplicate the estimations presented in columns 1 through 3 with the addition of covariates. Column 4 (based on Specification (1)) presents the results if a wife's health insurance risk is not explicitly considered. A husband's "risk" of losing affordable health insurance if he retires is associated with a 6.6 percentage point decline in the retirement rate, which is significant at the one percent level. Given that the sample retirement rate is 16.6 percent, this implies a 40 percent drop. The seven percentage point decline in husbands' retirement rate if they stand to lose their health insurance is consistent with previous estimates of the impact of retiree health insurance found in Madrian (1994) (seven to 15 percent decline in likelihood of retiring before a man reaches 65), Karoly and Rogowski (1994) (eight percentage point decline in retirement rate for men without RHI), and Blau and Gilleskie (2006) (eight percentage point difference in labor force exit for men

with and without RHI).

Column 5 of Table 5 presents the results for Specification (2), which adds an indicator for the wife only being at risk. Despite separating the households where the wife alone is at risk of losing her health insurance from the comparison group, the MME of the husband's risk is left unchanged. The addition of covariates changes the MME of the wife's exclusive "risk" from positive to significantly negative.[19] These results suggest that a household does consider a wife's risk of losing her health insurance when choosing the timing of a husband's retirement, but that the segment of the population where the husband and the wife have different health insurance prospects is not currently large enough for its exclusion to have an impact on estimations of the importance of health insurance when only the husband is considered. As discussed earlier, the trend in RHI offers may change this fact in the near future.

To identify whether each spouse's health insurance risk is equally weighted in household decision making, I next separately identify households where only the husband is at risk and both spouses are at risk (Specification (3)). The results in column 6 of Table 5 show the MME of all the risk indicators are negative and significant at the five percent level. The indicator for the husband's sole risk (a negative ten percentage point marginal effect on average) is about 60 percent larger than the MME for both at risk (negative six percentage points). Despite the fact that the husband's sole risk MME is almost twice that of the wife's (negative 5.2 percentage points), the hypothesis that the two MMEs are equal cannot be rejected at the ten percent level based on the results of a Wald test.

The MMEs of the other covariates are generally as one would expect based on previous literature. Table 5 shows that having a retired wife, a pension plan and each additional year of age have a positive association with retirement and are significant at the one percent level. Reaching the key ages of 62 (when he first qualifies for reduced Social Security benefits) and

[19]The fact that the health insurance risk MMEs change when other factors are included may raise concerns about the endogeneity of the health insurance indicators. Appendix Section B explores this question and finds the addition of age to be the most significant factor in the differences in the MMEs reported in Table 5.

65 (when he becomes eligible for Medicare and unreduced Social Security benefits) are also associated with large increases in the retirement rate. Though mostly insignificant, a wife's age is also associated with an increase in the rate of retirement while key milestone ages of 62 and 65 for wives are negatively associated with a change in the husbands' retirement rate. If a husband reports his health as fair or poor, he is significantly more likely to retire, but not if the wife rates her health as fair or poor.

Though MMEs give an overview of the impact of each risk category by looking at the average impact over the full sample, it is also interesting to look at the impact of each risk category at various points in the sample. Table 6 presents the marginal effects for the three risk categories from Specification (3) evaluated at various values of key covariates with other covariates valued at their means. The first panel examines the marginal effects for different age pairings of the couple. At the mean values for those ages (59.4 is rounded to 59 for husbands and 56.2 is rounded to 56 for wives), the marginal effects are slightly lower than the MMEs reported in Table 5, though all still significant at the five percent level. For each spouse, the marginal effects for all risk identifiers decrease as age increases by one standard deviation but the scale of change is much smaller as the wife ages compared to the husband. The marginal effect for all risk identifiers decreases by over two percent with each standard deviation change in the husband's age but by only 0.2 percent for a similar change in the wife's age. When evaluating the marginal effects of the risk identifiers at various levels of other key controls, Table 6 shows that their negative impact is greater for those husbands whose wives are retired, are not offered a pension, and who report being in fair or poor health. Changes to a wife's health and the household's non-housing wealth have little affect on the marginal effect of the health insurance risk facing the households.

One reason for the large difference in the MMEs for a husband's and wife's sole health insurance risk may be the differences in financial costs of health care and insurance associated with each gender. In the age range examined in this study, women tend to be healthier than men and to have lower medical costs which result in lower non-group insurance premiums.

If this difference is an important factor that has been missed in the above analysis, I would expect that the marginal effect of the risk of losing health insurance for women would be more similar to that of men when differences in health are better controlled for. Table 7 presents results when interacting the self-reported health measure with the health insurance risk categories used above. The MME in column 1 are replicated from the original specification in Table 5. Column 2 presents the results when the health measures are interacted with the appropriate health insurance risk indicator (e.g. the wife's sole risk is interacted with the wife's health measure). The inclusion of interaction terms has very little impact on the health insurance MMEs that involve the husband, but has a modest impact on the MME of the "wife only at risk" category. The inclusion of interaction terms decreases the magnitude of this MME by one percentage point and reduces the significance below traditional thresholds (from a significance level of five percent to just above ten percent). The opposite is true of the MMEs of the interaction terms.[20] Though they are generally negative, only the MME of the interaction term of the wife's self-rated health and the wife only at risk identifier is significant at traditional levels. This pattern seems to suggest that households are concerned about the husband's health insurance generally but consider the wife's primarily when she is in poor health. This pattern does not persist if other measures of health are used in place of self-rated health quality measures (see Appendix Section D where the existence of health conditions and hospital stays are substituted for self-rated health).

To examine the concern that health insurance may be acting as a proxy for job quality, Table 8 presents the MMEs of a probit analysis when a large number of the husband's job characteristics are included. Specifically, I include a number of the husband's reported job requirements (the husband reports that his job "always" or "most of the time" includes "physical effort," "good eyesight," "intense concentration," and "people skills") and characterizations of his job (the respondent "strongly agrees" or "agrees" that his job's tasks are "difficult," the job has "a lot of stress," older workers feel "pressure to retire" or are given

[20]The MMEs and standard errors for interaction terms reported in Table 7 have been adjusted to reflect the true magnitude of the interaction term's marginal effect described in Ai and Norton (2003).

"less demanding tasks," and whether he "enjoys" his work). The sample is limited to waves 3 through 8 due to the fact that questions about the enjoyment of work were not asked in the second wave of the HRS. Columns 1 and 2 of Table 8 show very little impact on the key MMEs when the second wave is dropped from the sample used in the original specification. Columns 3 through 4 shows that though a number of job characteristics are associated with significant differences in the retirement rate of husbands, their inclusion does not have a marked effect on the MMEs of the risk indicators. Thus, Table 8 is evidence that health insurance risk is not acting as a proxy for job quality.

6 Conclusion

Economic literature focusing on the retirement of near-elderly men has largely omitted controls for the health insurance implications of husbands' retirements for their wives. The results of this study suggest that households do consider the health insurance circumstances of both spouses when choosing the timing of a husband's retirement. I also find that the risk that a wife might lose the opportunity of low-cost health insurance has a similar impact on husbands' rate of retirement as the risk of a husband losing his own insurance, especially once a wife's health is thoroughly controlled for. In households where the wife is the only one at risk of losing affordable health insurance if the husband retires, the husband is 30 percent less likely to retire than if neither spouse is at risk (a five percentage point decrease in the retirement rate). These findings are similar to a previous finding that husbands are responsive to their wives' pension benefits when making individual labor force decisions (Coile 2004). The implications of these findings for the economic modeling of household decision making is that both spouses' financial or health insurance circumstances must be considered in order to correctly account for the incentives that each individual faces.

As a result of these findings, future policy analysis should take care to incorporate the effects for both an individual and his or her spouse when evaluating the impact of the

reformed health insurance market and any possible changes to the Medicare program to improve its financial solvency. If the current trend of declining RHI offer rates continues or accelerates due to the passage of the PPACA, a failure to include the effects of policy changes on a spouse may underestimate the impact on men's retirement rates. For example, new regulations to make private, non-group health insurance more affordable and accessible will not only move forward the retirement of those who would have otherwise waited to become eligible for Medicare, but also those who formerly appeared to be unresponsive to their own health insurance incentives because they were waiting to retire until their wives turned 65 as well.

Appendices

A Theoretical Motivation

Appendix Figure 2 shows a graphical representation of a husband's labor-leisure optimization problem when health insurance is tied to employment. For ease of analysis, I assume the wife's labor supply decision has already been made and the household is choosing the husband's labor supply to maximize its utility given the household budget constraint. One could imagine that this is the result of a common preference approach to family behavior (such as models based on Samuelson (1956) or Becker (1974)) in which an employment decision for the wife is made first. Alternatively, the optimization problem presented here could represent the decision faced by a husband in a Nash bargaining framework where each spouse takes the other's actions as given. This framework is common in much of the literature on cooperative family bargaining models.[21]

In this example, households have some level of income not earned by the husband in the current period (which may include income earned by the wife) and the value of any benefits not linked to on-going employment. Husbands can earn a constant wage for each hour of leisure they relinquish for labor. Because EPHI is usually a benefit offered only to full-time employees, the representation of the household's budget constraint is discontinuous at the point where the husband would be considered a full-time employee. The height of the kink could be thought of as the cost of non-group health insurance, as the expected additional medical costs to the household if not insured, or as the amount the household is willing to pay to avoid the risk of extremely large medical costs due to a negative health shock.[22] The solid black line in Appendix Figure 2 represents the budget constraint for a household where both

[21]For a more detailed discussion of the models of household decision making, see Lundberg and Pollack (1996).

[22]Though not represented in Appendix Figure 2, other benefits (pecuniary and non-pecuniary) for full-time workers would simply increase the size of the kink at full-time work while maintaining the less than full-time representations of the possible budget constraints.

spouses rely on the husband's employer for EPHI. By this, I mean that if the husband were not to work full-time, both the husband and the wife would be left with the choice between only high-cost private, non-group health insurance or going uninsured (because they do not have the options of Medicare, EPHI from the wife's employer, or RHI from the husband's employer).

The size of the kink in the budget constraint depends on how many household members are dependent on the husband's EPHI. In couples where the husband has retiree health insurance coverage, insurance through the wife's employer, or both spouses are eligible for Medicare, the budget constraint would be continuous because there is no added value of working full-time other than additional wages. This scenario is represented in Appendix Figure 2 as the fully linear budget constraint where the unearned income is the total of non-current employment-based income and the value of health insurance for both spouses. The budget line with a smaller discontinuity represents the case where only one spouse does not have an alternative health insurance source (for example, when only one spouse is eligible for Medicare). Prior research has excluded this case when examining the decision of men to retire.

Based on the depiction in Appendix Figure 2, individuals will maximize their utility (U_0 and U_1 represent indifference curves where $U_1 > U_0$) by choosing full-time employment if both spouses rely on the husband's employer for health insurance. If the husband becomes eligible for Medicare and the wife does not, the shape of an individual's indifference curve will determine whether the husband would maximize the household utility by continuing to work full-time or by reducing his labor. As depicted in Appendix Figure 2, a husband who becomes eligible for Medicare while his wife does not would still maximize the household's utility by working full-time. Models that do not include this intermediary case would predict that the husband would reduce his labor and may construe the lack of that response as an unresponsiveness to health insurance incentives.

B Decomposition of the Impact of Covariates on Key Mean Marginal Effects

The fact that the health insurance risk MMEs change in Table 5 when other factors are included may raise concerns about the endogeneity of the health insurance indicators. To answer this concern, the lower panel of Appendix Table 3 shows the contribution of additional covariate groupings using the values from analogously defined ordinary least squares (OLS) specifications. The upper panel of Appendix Table 3 presents the equivalent OLS results to Table 5 and shows the OLS estimates to be very close to the MMEs from the probit analyses. Using specification (2) as an example, the values in the lower panel were arrived at through the following series of equations:[23]

$$\text{HR} = a_0^A + a_1^A HI_{\text{husb}} + a_2^A HI_{\text{w only}} + \varepsilon^A \tag{4}$$

$$\text{HR} = a_0^B + a_1^B HI_{\text{husb}} + a_2^B HI_{\text{w only}} + a_3^B X + \varepsilon^B \tag{5}$$

$$\begin{aligned} x_1 &= b_1 + b_1^h HI_{\text{husb}} + b_1^w HI_{\text{w only}} + \varepsilon_1 \\ x_2 &= b_2 + b_2^h HI_{\text{husb}} + b_2^w HI_{\text{w only}} + \varepsilon_2 \\ &\vdots \\ x_r &= b_r + b_r^h HI_{\text{husb}} + b_r^w HI_{\text{w only}} + \varepsilon_r \end{aligned} \tag{6}$$

In the above equations, variables are labeled as in Section 4 where $X = (x_1, x_2, \ldots, x_r)$ and r is the number of additional covariates. Substituting equations (6) into equation (5) and collecting terms produces the following:

$$\text{HR} = b^B + \sum_{k=1}^{r} a_{3,k}^B (b_k) + \left(a_1^B + \sum_{k=1}^{r} a_{3,k}^B (b_k^h) \right) HI_{\text{husb}} + \left(a_2^B + \sum_{k=1}^{r} a_{3,k}^B (b_k^w) \right) HI_{\text{w only}} + \left(\varepsilon^B + \sum_{k=1}^{r} a_{3,k}^B (\varepsilon_k) \right) \tag{7}$$

[23] Though not included in the equations here, wave dummies continue to be included at every stage.

Therefore, the change in the coefficients of interest can be decomposed as

$$a_1^A - a_1^B = \sum_{k=1}^{r} \left(a_{3,k}^B(b_k^h) \right) \tag{8}$$
$$a_2^A - a_2^B = \sum_{k=1}^{r} \left(a_{3,k}^B(b_k^w) \right)$$

Each term on the right hand side of Equation (8) can be interpreted as the individual impact of the inclusion of that covariate on the change in the coefficient of interest. For example, the value for the contribution of the age variables is arrived at by taking the $\sum_{j=1}^{m} \left(a_{3,j}^B(b_j^h) \right)$ for the m factors related to age.[24] The bottom panel of Appendix Table 3 shows that almost all of the change in the health insurance risk coefficients is due to the inclusion of age variables and not spouse's retirement status, pension, wealth, health or education. If pensions or education had been large contributors to the difference in the health insurance risk MMEs, I would be concerned about other factors that this specification is not accounting for that may be associated with both the decision to retire and health insurance risk. The above analysis does not imply that health, wealth, pensions and education are not associated with a husband's decision to retire, just that their inclusion does not have a major impact on the coefficients associated with health insurance risk.

C Incorporating COBRA into the Definition of Heath Insurance Risk

One might also be concerned that employer continuation benefits have not been included in the definition of health insurance risk. Under federal law, employers with over 20 employees are required to allow separated employees who have EPHI to remain in their current health insurance plan, at 102 percent of the cost, for up to 18 months. This requirement is often referred to as COBRA benefits, named after the Consolidated Omnibus Budget Reconciliation

[24] They are husband's age, wife's age, husband 65 or over, wife 65 or over, husband 62 to 64, and wife 62 to 64.

Act of 1985. Forty of the fifty U.S. states have enacted state laws amplifying COBRA by lowering the employer size requirement.(Kaiser Family Foundation 2007) A few states have extended the benefits beyond 18 months for all employees in the state.[25] Six states have addressed the concerns of retirees specifically by requiring former employers of retirees who are near Medicare eligible age to offer continuation coverage until they reach the age of 65.[26] Unfortunately, the unrestricted HRS data does not include information on the state that a respondent lives in. The HRS does provide data on the region in which the respondents live, but the states enacting additional continuation laws are not localized to any single region. Generally, the take up rate for those who qualify for COBRA benefits is relatively low, with just over one in five exercising the option. (Flynn 1994)

Though there is not a direct question in the HRS that asks respondents if they are taking advantage of COBRA to continue their benefits, the definition of health insurance risk can be modified to incorporate the possibility that COBRA benefits play a significant role. Specifically, rather than defining "at risk" as those who depend on EPHI without an offer of RHI and will still be under 65 years of age when next observed, I lower the cut-off age by 18 months to 63 years, six months of age. After that age, a husband or wife could use COBRA to extend health insurance benefits to age 65 at which point he or she will be eligible for Medicare. Columns 1 and 2 in Appendix Table 2 replicate the analysis of a husband's decision to retire using the modified definitions of risk for each spouse. Compared to the original results in Table 5, the MMEs for most risk variables are only slightly different. Overall, the similar importance of husbands' and wives' risk in estimating the likelihood that a husband retires remains true.

[25] CT, MA, NH, NJ, NY, TX, MN, ND, SD, CA, and NV extend health insurance benefits to 36 months, FL to 29 months, and IL to 24 months.

[26] They are IL, LA, MD, MO, NH, and OR.

D Other Measures of Health

Appendix Table 4 examines the impact if self-rated health is replaced by two alternative measures of health. In columns 1 and 2, self-rated health is replaced by an indicator for the existence of a health condition. An individual is identified as having poor health if they report ever having any of the following health conditions: diabetes, cancer, lung disease, heart problems, or a stroke. Almost one-quarter of the sample has one of these listed conditions while only ten to 15 percent rate their health as fair or poor. Columns 3 and 4 present the results if overnight hospital stays in the previous twelve months are used as an indicator of poor health. Columns 1 and 3 show that the choice of health measures has very little impact on the MMEs of the health insurance risk variables as the MMEs are similar to those in Table 5. That said, the existence of a health condition for the wife has a significantly negative association with a husband's decision to retire, while her self-rated health and a hospital stay in the last year do not. When interaction terms are included in columns 2 and 4, their inclusion does not have the same impact as it did in the case of self-rated health (Table 7).[27] Unlike the specification using self-rated health, the MME on the wife's sole risk identifier remains significantly negative and the interaction term does not have a significantly negative MME when either of the two alternative measures of health are used. The difference in results here depending on which health proxy is used is not new to economic literature. Bound (1991) discusses the variation in results when using self-reported health or other health measures in retirement models but do not find one measure to be better than any other.

[27] As with the MME for the interaction terms in Table 7, adjustments have been made to reflect the true magnitude of the interaction term's marginal effect as described in Ai and Norton (2003).

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Table 1

Sample Restrictions

	Number of Households	Number of Observations
General Restrictions:		
Age eligible men or men with an age eligible spouse	6875	34440
Married currently and when last interviewed	6070	29220
Currently working and never retired	4388	14399
Not self-employed	3611	11110
Individual or spouse reports EPHI from his or her employer	3208	9618
Data Availability Restrictions:		
Non-missing health insurance source information for husband	3166	9092
Non-missing health insurance source information for spouse	3084	8634
Detailed pension data available	3052	8442
No non-missing control variables and weights	3044	8417

Table 2

Qualifications for "At Risk" of Losing Health Insurance upon a Husband's Retirement

	Percent of Analysis Sample
Qualifications for husband to be identified as "at risk":	
Husband is under 65 years of age	91.0%
Husband has EPHI from own employer	79.6%
Husband has EPHI from own employer but not offered RHI	29.8%
Wife does not have EPHI from her own employer	62.2%
All of the above are true	20.2%
Qualifications for wife to be identified as "at risk":	
Wife is under 65 years of age	95.0%
Wife has EPHI from husband's employer	55.7%
Wife has EPHI from husband's employer but no offer of RHI	21.3%
All of the above are true	20.3%

Analysis Sample: Married, husband not previously retired and not self-employed, HRS age-eligible, and at least one spouse with EPHI

Note: Values are weighted based on HRS household sampling weights.

Table 3

Share "At Risk" of Losing Health Insurance and Corresponding Retirement Rates

Categorization of the "Risk" of Losing Health Insurance if Husband Retires	Share of Sample in All Waves	Share of Sample in Wave Prior to Retirement	Retirement Rate in All Waves
Neither spouse is at risk	76.9%	83.7%	18.0%
Husband is at risk	20.2%	12.1%	9.9%
Wife is at risk	20.3%	14.8%	12.1%
Both spouses are at risk	17.5%	10.6%	10.1%
Husband is at risk but not the wife	2.8%	1.5%	9.1%
Wife is at risk but not the husband	2.9%	4.2%	24.2%

Analysis Sample: Married, husband not previously retired and not self-employed, HRS age-eligible, and at least one spouse with EPHI

Note: Values are weighted based on HRS household sampling weights.

Table 4

Risk Categorization by Characteristic Values

	Percent of	"At Risk" of Losing Health Insurance:		
	Full Sample	Both Spouses	Only Husband	Only Wife
Husband's Age				
Under 59	58.8%	20.1%	2.7%	1.5%
60-61	15.9%	18.6%	3.5%	1.4%
62-64	16.4%	16.3%	4.0%	1.4%
65+	9.0%	0.0%	0.0%	16.8%
Wife's Age				
Under 59	76.2%	19.1%	2.1%	2.1%
60-61	10.0%	17.3%	2.1%	3.7%
62-64	8.8%	13.3%	1.9%	10.0%
65+	5.0%	0.0%	16.5%	0.0%
Spouse is Retired				
Yes	11.1%	17.3%	9.1%	4.9%
No	88.9%	17.5%	2.0%	2.6%
Pension				
Yes	81.2%	18.6%	2.3%	2.6%
No	18.8%	12.6%	4.9%	4.2%
Wealth				
Bottom 10%	10.0%	23.0%	5.5%	3.4%
Bottom 25%	25.0%	19.5%	5.0%	3.2%
2nd Quartile	25.0%	16.3%	2.3%	2.6%
3rd Quartile	25.0%	16.6%	2.0%	3.0%
Top 25%	25.0%	17.4%	1.8%	2.7%
Top 10%	10.0%	17.7%	2.3%	3.0%

Analysis Sample: Married, husband not previously retired and not self-employed, HRS age-eligible, and at least one spouse with EPHI

Note: Values are weighted based on HRS household sampling weights.

Table 5

The Mean Marginal Effects (MMEs) of Both Spouses' Health Insurance Risk on Husbands' Retirements

	1	2	3	4	5	6
	Husband's Risk Only	Husband's Risk and Wife's Non-shared Risk	Fully Exclusive Risk Categories	Husband's Risk Only	Husband's Risk and Wife's Non-shared Risk	Fully Exclusive Risk Categories
Husband "at risk" of losing health insurance if he retires	-0.083***	-0.081***		-0.066***	-0.066***	
	[0.010]	[0.010]		[0.012]	[0.011]	
Both "at risk" of losing health insurance if husband retires			-0.079***			-0.061***
			[0.010]			[0.012]
Only husband "at risk" of losing health insurance if he retires			-0.090***			-0.101***
			[0.018]			[0.021]
Only wife "at risk" of losing health insurance if husband retires		0.051*	0.051*		-0.053**	-0.052**
		[0.028]	[0.028]		[0.022]	[0.022]
Wife is retired				0.069***	0.070***	0.072***
				[0.017]	[0.017]	[0.017]
Husband has a pension plan (DB, DC, or both)				0.038***	0.038***	0.037***
				[0.011]	[0.011]	[0.011]
Husband's age in years at next wave (NW)				0.017***	0.017***	0.017***
				[0.002]	[0.002]	[0.002]
Wife's age in years at NW				0.002	0.001	0.001
				[0.001]	[0.001]	[0.001]
Husband will be between 62 & 64 years old at NW				0.135***	0.134***	0.134***
				[0.019]	[0.019]	[0.019]
Wife will be between 62 & 64 years old at NW				-0.009	-0.007	-0.007
				[0.015]	[0.015]	[0.015]
Husband will be 65 years old or older at NW				0.066***	0.075***	0.073***
				[0.024]	[0.025]	[0.025]
Wife will 65 years old or older at NW				-0.027	-0.033*	-0.028
				[0.018]	[0.018]	[0.019]
Husband's self-rated health is fair/poor				0.056***	0.056***	0.056***
				[0.016]	[0.016]	[0.016]
Wife's self-rated health is fair/poor				0.003	0.002	0.004
				[0.014]	[0.014]	[0.014]
Real total non-housing assets (in 100k's)				-0.004	-0.004	-0.004
				[0.004]	[0.004]	[0.004]
Husband's educational attainment is less than high school diploma				-0.018	-0.018	-0.018
				[0.014]	[0.014]	[0.014]
Husband's educational attainment is some college but no degree				-0.003	-0.004	-0.004
				[0.013]	[0.013]	[0.013]
Husband's educational attainment is college degree or more				-0.018	-0.018	-0.018
				[0.013]	[0.013]	[0.013]
Wife's educational attainment is less than high school diploma				-0.007	-0.006	-0.005
				[0.015]	[0.015]	[0.015]
Wife's educational attainment is some college but no degree				-0.009	-0.009	-0.009
				[0.012]	[0.012]	[0.012]
Wife's educational attainment is college degree or more				-0.019	-0.019	-0.019
				[0.014]	[0.014]	[0.014]
Observations	8417	8417	8417	8417	8417	8417

Standard errors in brackets, clustered by Household. * significant at 10%; ** significant at 5%; *** significant at 1%

Note: Values are weighted based on HRS sampling weights. Wave dummies are included in all specifications.

Sample: Husband or wife had EPHI in the previous wave, husband has not previously retired, husband is not self-employed, and one spouse is age eligible for Initial or War Baby cohort of the HRS.

Table 6

The Marginal Effect of Health Insurance Risk Evaluated at Different Covariate Values

	"At Risk" of Losing Health Insurance:					
	Both Spouses		Husband Only		Wife Only	
	Marginal Effect	SE	Marginal Effect	SE	Marginal Effect	SE
Husband's Age/Wife's Age						
At ages 55/50	-0.036***	[0.007]	-0.052***	[0.010]	-0.029**	[0.011]
At ages 55/56	-0.038***	[0.008]	-0.055***	[0.010]	-0.030**	[0.012]
At ages 55/62	-0.040***	[0.008]	-0.059***	[0.011]	-0.032**	[0.013]
At ages 59/50	-0.054***	[0.011]	-0.080***	[0.015]	-0.043**	[0.018]
At ages 59/56 (mean)	-0.056***	[0.011]	-0.085***	[0.016]	-0.045**	[0.018]
At ages 59/62	-0.059***	[0.012]	-0.089***	[0.017]	-0.047**	[0.019]
At ages 64/50	-0.078***	[0.017]	-0.123***	[0.026]	-0.063**	[0.027]
At ages 64/56	-0.080***	[0.017]	-0.128***	[0.026]	-0.065**	[0.028]
At ages 64/62	-0.083***	[0.018]	-0.132***	[0.028]	-0.067**	[0.029]
Wife's Retired?						
No	-0.054***	[0.011]	-0.081***	[0.015]	-0.043**	[0.018]
Yes	-0.073***	[0.015]	-0.114***	[0.024]	-0.059**	[0.025]
Husband has a pension?						
No	-0.047***	[0.010]	-0.070***	[0.014]	-0.038**	[0.015]
Yes	-0.058***	[0.012]	-0.088***	[0.016]	-0.047**	[0.019]
Couple's Self-Rated Health						
Both "Good," "Very Good," or "Excellent"	-0.054***	[0.011]	-0.082***	[0.015]	-0.043**	[0.018]
Husband only "Fair" or "Poor"	-0.069***	[0.015]	-0.107***	[0.022]	-0.056**	[0.023]
Wife only "Fair" or "Poor"	-0.055***	[0.012]	-0.083***	[0.017]	-0.044**	[0.018]
Both "Fair" or "Poor"	-0.070***	[0.015]	-0.109***	[0.023]	-0.057**	[0.024]
Non-Housing Wealth in 2000 Dollars						
$5,513 (10th Percentile)	-0.056***	[0.011]	-0.085***	[0.016]	-0.045**	[0.018]
$22,825 (25th Percentile)	-0.056***	[0.011]	-0.085***	[0.016]	-0.045**	[0.018]
$70,129 (50th Percentile)	-0.056***	[0.011]	-0.085***	[0.016]	-0.045**	[0.018]
$203,982 (75th Percentile)	-0.056***	[0.011]	-0.085***	[0.016]	-0.045**	[0.018]
$449,518 (90th Percentile)	-0.056***	[0.011]	-0.084***	[0.016]	-0.045**	[0.018]

Standard errors in brackets. Clustered by household. * significant at 10%; ** significant at 5%; *** significant at 1%

Note: Values are weighted based on HRS sampling weights. All marginal effects evaluated at the mean of covariates unless otherwise specified.

Sample: Husband or wife had EPHI in the previous wave, husband has not previously retired, husband is not self-employed, and one spouse is age eligible for Initial or War Baby cohort of the HRS

Table 7

Analysis of Husbands' Retirements with Interactions of Health Measures

	1 Original Specification	2 Interactions Specification
Both "At Risk" of Losing Health Insurance if Husband Retires	-0.061*** [0.012]	-0.058*** [0.015]
Only Husband "At Risk" of Losing Health Insurance if He Retires	-0.101*** [0.021]	-0.102*** [0.023]
Only Wife "At Risk" of Losing Health Insurance if Husband Retires	-0.052** [0.022]	-0.04 [0.025]
Husband's Health Measure Poor	0.056*** [0.016]	0.056*** [0.017]
Wife's Health Measure Poor	0.004 [0.014]	0.01 [0.016]
Interaction of Husband having a Poor Self-rated Health with Joint Health Insurance Risk		-0.009 [0.040]
Interaction of Wife having a Poor Self-rated Health with Joint Health Insurance Risk		-0.020 [0.031]
Interaction of Husband's Poor Self-rated Health with Husband Only Health Insurance Risk		-0.024 [0.055]
Interaction of Wife's Poor Self-rated Health with Wife Only Health Insurance Risk		-0.078** [0.040]
Additional Covariates	Yes	Yes
Observations	8417	8417

Standard errors in brackets. Clustered by Household. * significant at 10%; ** significant at 5%; *** significant at 1%

Note 1: Values are weighted based on HRS sampling weights. Wave dummies included in all specifications. Additional covariates include whether a wife is retired, whether a husband has a pension, household wealth, and each spouse's age, age category, and education level.

Note 2: MMEs for interaction terms have been adjust based on Ai and Norton (2003).

Sample: Husband or wife had EPHI in the previous wave, husband has not previously retired, husband is not self-employed, and one spouse is age eligible for Initial or War Baby cohort of the HRS

Table 8

Additional Specifications Examining Husbands' Retirements with Job Characteristics

		1	2	3	4
		Original Specification Waves 3 through 8		Including Job Characteristics	
	Means Wave 3 through Wave 8	Husband's Risk and Wife's Non-shared Risk	Fully Exclusive Risk Categories	Husband's Risk and Wife's Non-shared Risk	Fully Exclusive Risk Categories
Husband "at risk" of losing health insurance if he retires	0.215	-0.072***		-0.070***	
		[0.013]		[0.013]	
Both "at risk" of losing health insurance if husband retires	0.184		-0.066***		-0.064***
			[0.014]		[0.014]
Only husband "at risk" of losing health insurance if he retires	0.031		-0.106***		-0.101***
			[0.023]		[0.023]
Only wife "at risk" of losing health insurance if husband retires	0.032	-0.054**	-0.053**	-0.052**	-0.051**
		[0.024]	[0.024]	[0.024]	[0.024]
Job Requirement: "Physical effort" all or most of the time	0.288			-0.008	-0.008
				[0.013]	[0.013]
Job Req.: "Good eyesight" all or most of the time	0.807			-0.02	-0.02
				[0.018]	[0.018]
Job Req.: "Intense concentration" all or most of the time	0.788			-0.014	-0.014
				[0.017]	[0.017]
Job Req.: "People skills" all or most of the time	0.797			-0.008	-0.008
				[0.015]	[0.015]
Job Condition: Strongly agree or agree that tasks are more difficult than before	0.505			0.014	0.013
				[0.012]	[0.012]
Job Cond.: Strongly agree or agree that job has a lot of stress	0.580			0	0
				[0.012]	[0.012]
Job Cond.: Strongly agree or agree that older workers feel pressure to retire	0.154			0.069***	0.069***
				[0.017]	[0.017]
Job Cond.: Strongly agree or agree that older workers given less demanding tasks	0.315			-0.028**	-0.027**
				[0.012]	[0.012]
Job Req.: At least one value missing in HRS	0.759			0.018	0.02
				[0.046]	[0.046]
Job Cond.: At least one value missing in HRS	0.080			-0.079***	-0.080***
				[0.029]	[0.029]
Job Cond.: Strongly agree or agree that "enjoy" work	0.095			-0.077***	-0.077***
				[0.016]	[0.016]
Job Cond.: Enjoy work missing in HRS	0.100			-0.032	-0.032
				[0.024]	[0.024]
Additional Covariates		Yes	Yes	Yes	Yes
Observations	6661	6661	6661	6661	6661

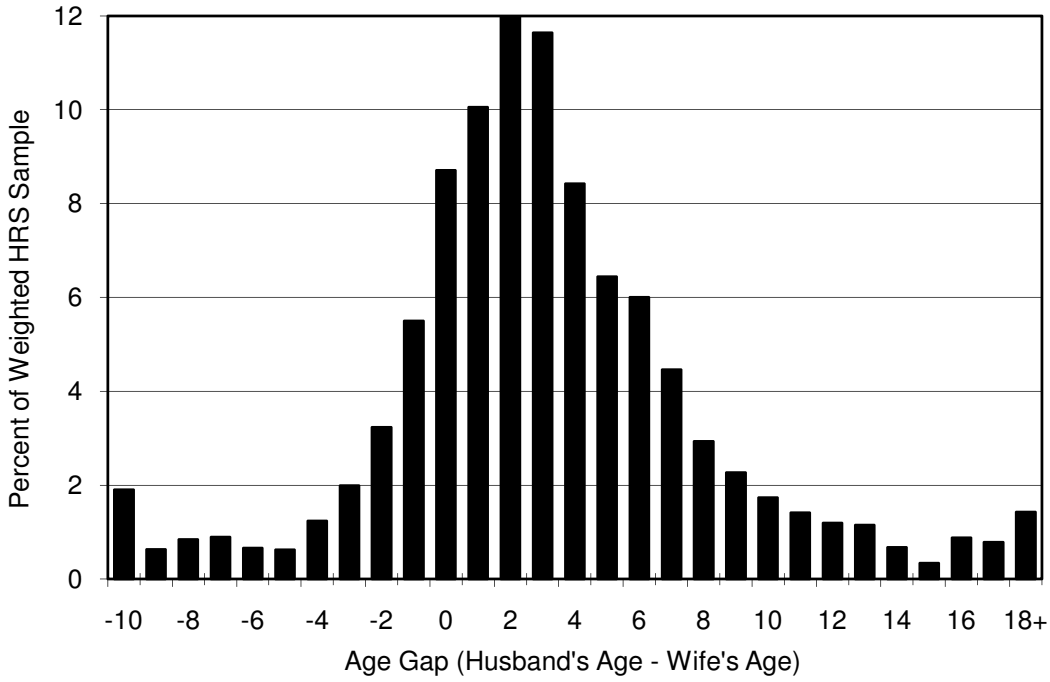
Standard errors in brackets. Clustered by Household. * significant at 10%; ** significant at 5%; *** significant at 1%.

Note: "Enjoy job" is only available in waves 3 through 8. Values are weighted based on HRS sampling weights. Wave dummies are included in all specifications. Additional covariates include whether a wife is retired, whether a husband has a pension, household wealth, and each spouse's age, age category, self-reported health and education level.

Sample: Husband or wife had EPHI in the previous wave, husband has not previously retired, husband is not self-employed, and one spouse is age eligible for Initial or War Baby cohort of the HRS

Appendix Figure 1

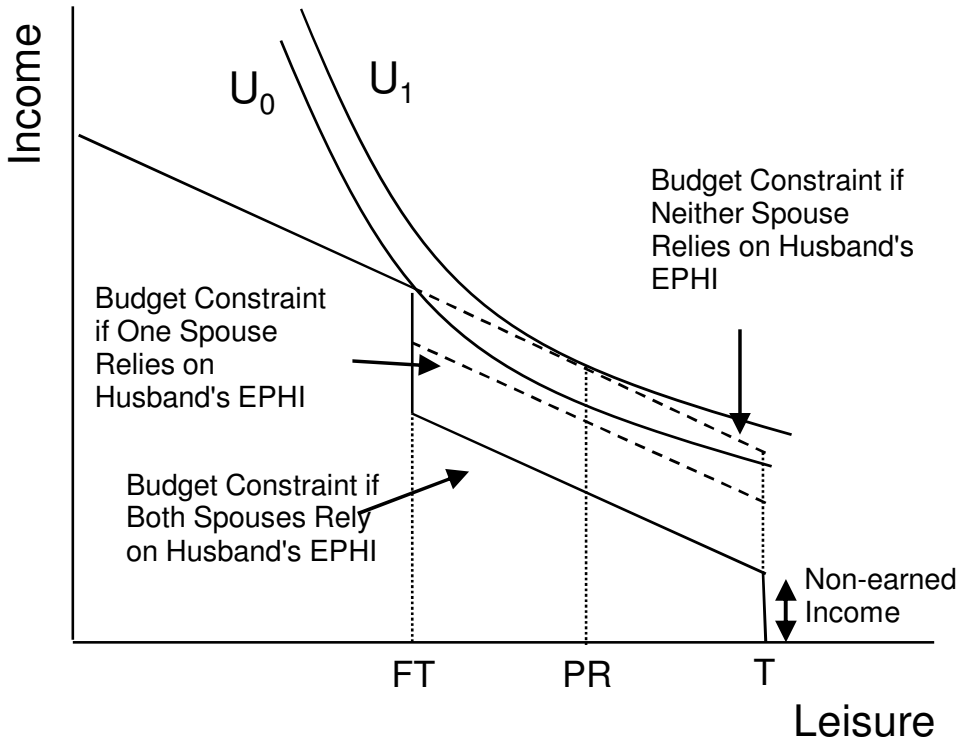
Distribution of the Age Gap between Spouses in a Household



Note: Distribution is based on household weights for HRS households where husband is working at the first interview.

Appendix Figure 2

An Example of the Optimization Problem when Health Insurance is Linked to Employment



Appendix Table 1

Comparing Characteristics of Those "At Risk" of Losing Health Insurance at a Husband's Retirement and Those Not "At Risk"

	Mean if Husband Is "At Risk"	Mean if Husband Is Not "At Risk"	Probability Means Are Equal
Wife Is Working	53.0%	71.3%	0.00
Wife Is Retired	31.9%	53.7%	0.00
Wife Is Working Full-time	15.2%	11.7%	0.00
Husband's Age	56.31	57.55	0.00
Husband Is Over 65	0.0%	5.7%	0.00
Husband Is between 62 and 64	5.8%	13.6%	0.00
Wife's Age	53.96	54.19	0.16
Wife Is Over 65	3.3%	2.3%	0.01
Wife Is between 62 and 64	4.0%	6.7%	0.00
Husband's Self-rated Health Is Fair or Poor	14.1%	11.7%	0.01
Husband Reports a Health Condition	24.8%	26.2%	0.27
Husband Had a Hospital Stay in the Last Year	12.9%	13.9%	0.32
Wife's Self-rated Health is Fair or Poor	21.6%	14.0%	0.00
Wife Reports a Health Condition	27.3%	24.0%	0.01
Wife Had a Hospital Stay in the Last Year	16.9%	13.7%	0.00
Husband Reports Any Pension	81.1%	79.2%	0.10
Husband Reports a Defined Benefit (DB) Pension	43.1%	48.5%	0.00
Husband Reports a Defined Contribution (DC) Pension	46.9%	40.1%	0.00
Husband Reports Both Types of Pensions	18.1%	18.8%	0.52
Household Non-Housing Wealth in Millions (2000 Dollars)	0.162	0.200	0.14
Husband's Education: Less than High School Diploma	17.2%	16.6%	0.56
Husband's Education: High School Diploma	38.2%	34.7%	0.01
Husband's Education: Less than College Degree	18.2%	20.6%	0.03
Husband's Education: College Degree	26.2%	27.8%	0.21
Wife's Education: Less than High School Diploma	19.8%	14.2%	0.00
Wife's Education: High School Diploma	34.8%	33.4%	0.31
Wife's Education: Less than College Degree	24.1%	24.2%	0.98
Wife's Education: College Degree	15.9%	20.3%	0.00
Number of Household-Wave Observations	1529	6888	

Note: Probabilities represent the results from a simple t-test.

Sample: Husband or wife had EPHI in the previous wave, husband has not previously retired, husband is not self-employed, and one spouse is age eligible for Initial or War Baby cohort of the HRS

Appendix Table 2

Analysis Using Definitions of Health Insurance Risk that Incorporate Possibility of COBRA

	Means	1 Husband's Risk and Wife's Non-shared Risk using Max Age 63.5	2 Fully Exclusive Risk Categories using Maximum Age 63.5
Husband "at risk" of losing health insurance if he retires	0.188	-0.065*** [0.012]	
Both "at risk" of losing health insurance if husband retires	0.161		-0.063*** [0.013]
Only husband "at risk" of losing health insurance if he retires	0.027		-0.083*** [0.024]
Only wife "at risk" of losing health insurance if husband retires	0.033	-0.053** [0.020]	-0.053** [0.020]
Additional Covariates		Yes	Yes
Observations	8417	8417	8417

Note: Values are weighted based on HRS sampling weights. Wave dummies are included in all specifications. Additional covariates include whether a wife is retired, whether a husband has a pension, household wealth, and each spouse's age, age category, self-reported health and education level.

Sample: Husband or wife had EPHI in the previous wave, husband has not previously retired, husband is not self-employed, and one spouse is age eligible for Initial or War Baby cohort of the HRS

Appendix Table 3

Decomposition of Changes to Health Insurance Risk Probit MME's when Adding Additional Covariates Using Ordinary Least Squares

A: Analogous Analysis Using Ordinary Least Squares

	1	2	3	4
	Husband's Risk and Wife's Non-shared Risk		Fully Exclusive Risk Categories	
Husband "At Risk" of Losing Health Insurance if He Retires	-0.082	-0.058		
	[0.010]***	[0.010]***		
Both "At Risk" of Losing Health Insurance if Husband Retires			-0.080	-0.053
			[0.011]***	[0.011]***
Only Husband "At Risk" of Losing Health Insurance if He Retires			-0.094	-0.097
			[0.019]***	[0.021]***
Only Wife "At Risk" of Losing Health Insurance if Husband Retires	0.052	-0.054	0.052	-0.053
	[0.029]*	[0.027]**	[0.029]*	[0.027]**
Additional Covariates	No	Yes	No	Yes
Observations	8417	8417	8417	8417

B: Net Contribution of Covariate Groupings to the Difference in OLS Coefficients

	1	2	3	4	5
	Husband's Risk and Wife's Non-shared Risk		Fully Exclusive Risk Categories		
	Husband at Risk	Wife Only at Risk	Both at Risk	Husband Only at Risk	Wife Only at Risk
Difference in OLS Coefficient	-0.024	0.107	-0.028	0.002	0.106
Age Variables	-0.031	0.100	-0.033	-0.016	0.098
Spouse Retired	0.003	0.006	0.001	0.019	0.006
Pension & Wealth	0.001	-0.003	0.002	-0.004	-0.003
Health	0.002	0.002	0.001	0.003	0.002
Husband's Education	0.000	0.000	0.000	0.000	0.000
Wife's Education	0.000	0.001	0.000	0.000	0.001
Difference in Probit MME	-0.021	0.104	-0.018	0.011	0.103

Notes: "Age Variables" include husband's and wife's raw age, whether 65 or over, and whether between 62 and 65. "Pension and Wealth" includes whether husband has any pension and household's non-housing wealth. "Health" includes husband's and wife's self-rated health. "Education" includes categorical values of "Less than High School," "Some College," and "College Degree" for each spouse.

Appendix Table 4

Analysis of Husbands' Retirements with Interactions of Other Health Measures

	1	2	3	4
	Health Conditions		Hospital Stay in Last Year	
Both "at risk" of losing health insurance if husband retires	-0.060***	-0.062***	-0.060***	-0.059***
	[0.012]	[0.016]	[0.012]	[0.015]
Only husband "at risk" of losing health insurance if he retires	-0.097***	-0.099***	-0.096***	-0.087***
	[0.021]	[0.025]	[0.021]	[0.023]
Only wife "at risk" of losing health insurance if husband retires	-0.052**	-0.048*	-0.050**	-0.049**
	[0.022]	[0.026]	[0.023]	[0.024]
Husband's health measure poor	0.034***	0.035***	0.041***	0.049***
	[0.011]	[0.012]	[0.015]	[0.016]
Wife's health measure poor	-0.029***	-0.031***	-0.011	-0.017
	[0.011]	[0.012]	[0.013]	[0.014]
Interaction of husband's poor health measure with joint HI risk		-0.016		-0.043
		[0.027]		[0.033]
Interaction of wife's poor health measure with joint HI risk		0.027		0.039
		[0.027]		[0.034]
Interaction of husband's poor health measure with husband only HI risk		-0.00645		-0.105***
		[0.048]		[0.042]
Interaction of wife's poor health measure with wife only HI risk		-0.011		-0.005
		[0.038]		[0.050]
Additional Covariates	Yes	Yes	Yes	Yes
Observations	8397	8397	8414	8414

Standard errors in brackets. Clustered by Household. * significant at 10%; ** significant at 5%; *** significant at 1%

Note 1: Health conditions include ever having diabetes, cancer, lung disease, heart problems, or a stroke. Wave dummies included in all specifications.

Note 2: Values are weighted based on HRS sampling weights. Wave dummies included in all specifications. Additional covariates include whether a wife is retired, whether a husband has a pension, household wealth, and each spouse's age, age category, and education level.

Note 3: MMEs for interaction terms have been adjust based on Ai and Norton (2003).

Sample: Husband or wife had EPHI in the previous wave, husband has not previously retired, husband is not self-employed, and one spouse is age eligible for Initial or War Baby cohort of the HRS

Appendix Table 5

Additional Specification Examining Husbands' Retirements with Pension Types

	1	2
	Husband's Risk and Wife's Non-shared Risk	Fully Exclusive Risk Categories
Husband "at risk" of losing health insurance if he retires	-0.060***	
	[0.012]	
Both "at risk" of losing health insurance if husband retires		-0.056***
		[0.013]
Only husband "at risk" of losing health insurance if he retires		-0.089***
		[0.022]
Only wife "at risk" of losing health insurance if husband retires	-0.048**	-0.047**
	[0.022]	[0.022]
Husband reports both a defined benefit (DB) and defined contribution (DC) pension	0.051***	0.050***
	[0.016]	[0.016]
Husband reports only a DB pension	0.085***	0.084***
	[0.015]	[0.015]
Husband reports only a DC pension	-0.024*	-0.024*
	[0.013]	[0.013]
Additional Covariates	Yes	Yes
Observations	8417	8417

Standard errors in brackets. Clustered by household. * significant at 10%; ** significant at 5%; *** significant at 1%.

Note 1: Additional covariates include whether a wife is retired, household wealth, and each spouse's age, age category, self-reported health and education level. Wave dummies are included in all specifications.

Note 2: Values are weighted based on HRS sampling weights.

Sample: Husband or Wife had EPHI in the previous wave, Husband has not previously retired, Husband is not self-employed, and one spouse is age eligible for Initial or War Baby cohort of the HRS