Health Insurance Costs and Early Retirement Decisions

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ABSTRACT

The loss of health insurance upon retirement may be an important component of the cost of retirement, especially for workers without retiree health insurance coverage. We found that insurance costs significantly reduced retirement rates for full-time workers ages 55 to 61. Our estimated elasticities ranged from –0.11 to –0.14 for men and from –0.14 to –0.19 for women. Our model predicted that several proposed health insurance reforms, including Medicare buy-ins, tax incentives to purchase insurance, and extensions of mandated continuation coverage would only slightly increase early retirement rates, however, because they would not substantially reduce premium costs for most workers.

INTRODUCTION

Employer-sponsored health insurance (ESI) coverage has special importance for the near elderly. Unlike elderly Americans, those in their late fifties and early sixties are not eligible for Medicare benefits, unless they are disabled. Because the risk of expensive health problems increases with age in adulthood, non-group health insurance coverage can be prohibitively expensive for the near elderly. Going without health insurance altogether can be especially risky, because the threat of serious health problems can expose uninsured near-elderly persons to catastrophic health care costs. Employers, then, may provide the only affordable source of health insurance coverage for most persons approaching the Medicare eligibility age.

Because of their importance, health benefits can be a major factor in the retirement decision. For workers receiving health benefits from their employers that do not continue after retirement, the loss of coverage can be costly and can discourage retirement before workers become eligible for Medicare. For many insured workers, coverage can continue after retirement, either in the form of retiree health insurance (RHI) subsidized by the employer or through federally-mandated continuation coverage, for which the former employee bears the entire cost. However, coverage can be quite expensive when not subsidized by an employer, and subsidized RHI coverage can be substantially more costly than the benefits received by an active employee. Thus, even for workers with RHI, the health insurance costs associated with retirement can be large and can act as powerful disincentives to early retirement. If current trends continue and RHI coverage becomes less available and more costly in the future, health insurance costs may emerge as an even more important factor in the early retirement decision in coming decades.

This paper estimates the effects of health insurance costs on early retirement for a sample of full-time workers ages 55 to 61. Although previous studies have examined the relationship between post-retirement health insurance options available to the worker and retirement decisions, they have not considered the role of the cost of health insurance in the early retirement decision. Given the wide variation in cost sharing across different health insurance plans, it is important to model explicitly the impact of costs, especially in light of evidence that RHI coverage has become more expensive in recent years. By quantifying the effects of health insurance costs on labor supply decisions, we were able to estimate not only the impact of RHI coverage on early retirement rates, but also to simulate the effects of different health reform initiatives that have recently been proposed. In particular, we examined the potential impact on retirement of Medicare buy-in options, tax deductions and tax credits for insurance premium expenses, and extensions of the federally-mandated period during which employers must provide continuation coverage to their former workers.

BACKGROUND

For workers who receive health benefits from their employers, the loss of health benefits upon retirement can be a substantial portion of the total cost of retirement. Economic theory predicts that workers weigh the benefits of increased leisure time against the costs of lost labor market compensation when making retirement decisions. For many workers, health benefits are an important component of their compensation. Employers can generally provide workers with less costly insurance than they could purchase themselves because employment-based coverage offers access to group insurance plans, which charge lower premiums than individual plans, and because employers often subsidize premiums for their workers. Consequently, the loss of health

benefits can be an important consideration as workers prepare to retire.

Although employer-sponsored health insurance is sometimes available to workers after they retire, for many workers health benefits end when they withdraw from the labor force, and the fraction of workers eligible for retiree health benefits has been declining in recent years. For example, in 1996 only 40 percent of large firms employing at least 500 workers offered post-retirement health benefits, compared to 46 percent of large firms in 1993 (Foster Higgins, 1997).[1] Even for workers with retiree health insurance, post-retirement benefits are generally less generous and require more employee cost sharing than benefits provided to current workers. In 1995, for example, large firms that offered ESI paid on average 77 percent of the health insurance premium costs for active workers, but those that offered RHI paid only 52 percent of the premium costs for retired workers (Foster Higgins, 1996). In addition, retiree health insurance plans appear to have become more costly to participants in recent years. Among full-time workers in medium and large firms that offered RHI coverage, the percentage who would be required to make contributions upon retirement to offset at least part of the cost of their plans increased from 35 percent in 1985 to 91 percent in 1995 (Karoly and Rogowski, 1998b; Bureau of Labor Statistics, 1998). Primarily because of the high cost of coverage, 27 percent of retired workers in 1994 who had been offered RHI turned coverage down (Loprest, 1998). Other cost-cutting measures that firms have increasingly implemented in recent years include the tightening of eligibility requirements, the introduction of caps on the future obligations that employers could

[1]More than 60 percent of large firms in the Foster Higgins survey reported offering retiree health benefits in 1988. Although this offer rate is not directly comparable to more recent numbers because of changes in the survey methodology implemented in 1993, it does suggest that the decline in post-retirement health benefits observed in the mid-1990s began at least several years earlier (General Accounting Office, 1997).

face for their RHI plans, and the substitution of indemnity plans with managed care plans (Hewitt Associates, 1997). The cutbacks are generally attributed to rising health care costs and new accounting rules, introduced in 1993, requiring employers for the first time to recognize the present value of expected future retiree health care costs as liabilities on their balance sheets (General Accounting Office, 1997).

Workers who forfeit employer-sponsored coverage when they retire can generally find other types of health insurance, but the alternatives can be quite expensive. Under COBRA regulations, employers with 20 or more employees are required to provide continuation coverage to former employees for up to 18 months. However, the worker is responsible for the full premium cost during that period, plus an additional 2 percent of the premium cost to cover administrative expenses. These premium costs can be quite large. Insurance costs become even more expensive after continuation coverage runs out and retirees are forced to rely upon the non-group market if they are still ineligible for Medicare. Non-group policies are generally quite expensive, especially for individuals with pre-existing medical conditions (Chollet and Kirk, 1998). The Health Insurance Portability and Accountability Act (HIPAA) now guarantees conversion from group coverage to individual coverage without any pre-existing condition exclusions, but it does not guarantee that the premiums will be affordable. For the near elderly, who are more likely than younger individuals to experience health problems, the cost of non-group coverage can be prohibitive.

A number of proposals have recently been advanced to increase health insurance coverage among the near elderly. The Clinton administration proposed in 1998 that Medicare benefits be extended to persons ages 62 to 64 who lack employment-based health insurance, as

long as they pay the full cost of coverage. The Congressional Budget Office (1998) estimated that monthly premiums for persons who buy into the Medicare program would cost about $310 in 1999. In addition, for every year that beneficiaries participated in Medicare before age 65, they would have to pay about $10 per month in higher Medicare premiums between the ages of 65 to 84. Since the Clinton proposal was designed to be cost-neutral, the exact amount of the supplemental premium would depend upon the costs incurred by each cohort before age 65. If the adverse selection problem were severe and individuals with serious health problems who used expensive health services disproportionately elected to buy into Medicare, the supplemental premium could be substantially larger. Although probably less expensive than most individual indemnity policies, the high cost of the buy-in program may limit participation. Another set of proposals would offer tax incentives for the purchase of insurance coverage. For example, the tax relief bill passed by Congress in August 1999 would phase in the full deductibility of health insurance premium costs for persons without ESI or whose employers paid less than one-half of the premium costs (H.R. 2488). An initiative advocated by the chairman of the Senate Health, Education, Labor and Pensions Committee would provide a tax credit of up to $1,200 per year for adults with incomes up to 150 percent of the federal poverty level for the purchase of group or individual insurance (American Health Line, 1999). Other reform initiatives would increase the period of time during which employers would be required to offer former workers unsubsidized continuation coverage (known as COBRA coverage).

In addition to increasing health insurance coverage among the near elderly, these proposals may also encourage early retirement. For example, because Medicare provides relatively low-cost health insurance, the Medicare eligibility age can influence the timing of

retirement through its effect on the costs associated with withdrawing from the labor force. Lowering the Medicare eligibility age to 62 through a buy-in program would reduce the length of time during which retirees would need to purchase expensive continuation coverage or non-group coverage in order to avoid becoming uninsured, and thus would likely encourage early retirement, especially for workers with ESI coverage but without RHI offers. Tax breaks for the purchase of insurance coverage would reduce the cost differential between subsidized ESI coverage and less generous RHI coverage, unsubsidized continuation coverage, or non-group coverage. In addition, requiring employers to extend continuation coverage for additional months would delay the need to purchase non-group coverage, which is generally more expensive than unsubsidized group plans.

Policy initiatives that promote retirement merit special scrutiny. As society continues to age, there is increasing concern about the mounting costs of supporting retired workers. Many initiatives that would discourage early retirement are under serious consideration, including proposals to increase the age at which persons would be eligible for Social Security benefits and subsidized Medicare benefits. However, by providing incentives to retire early, initiatives that expand the availability of post-retirement health benefits may undermine efforts to induce older workers to remain in the labor force. Consequently, information about the relationship between health insurance costs and retirement behavior is critical.

A series of recent papers has concluded that the availability of health insurance after retirement does encourage workers to withdraw from the labor force. Using longitudinal data from the Health and Retirement Study (HRS), Blau and Gilleskie (1997) found that men between the ages of 51 and 61 who were eligible for post-retirement health benefits were substantially

more likely to exit from employment than men without such benefits. Their estimates of the impact of RHI increased with age and were larger when the employer paid the full cost of RHI coverage than when the costs were shared between the employer and the retired worker. Karoly and Rogowski (1998a) reached similar conclusions. They found that retirement rates for men in the HRS were 62 percent larger for men with RHI offers than for men who had health benefits while working but were not eligible for benefits during retirement. In earlier work using the Survey of Income and Program Participation (SIPP), Karoly and Rogowski (1994) found that the availability of RHI increased retirement rates by about 8 percentage points, representing a 50 percent increase in the baseline retirement probability, although they had to impute the availability of post-retirement health benefits for their sample because the SIPP lacks information about RHI offers. Gustman and Steinmeier (1994), however, found that the effects of post-retirement health benefits were quite small, accelerating retirement for men by only 1.3 months.

Other studies have found that the availability of Medicare benefits and government-mandated continuation coverage can affect retirement behavior. Rust and Phelan (1997) concluded that individuals who would lose their employer-provided health insurance by retiring often wait until they become eligible for Medicare before withdrawing from the labor force. Madrian and Beaulieau (1998) found that retirement hazards among married men ages 55 to 69 were higher for those with Medicare-eligible spouses than for those whose spouses had not yet reached age 65, perhaps because of the expense of purchasing health insurance for spouses who were not yet old enough to qualify for Medicare benefits. Government mandates that require employers to continue insurance coverage for a specified period of time after workers leave the firm appear to encourage retirement as well. According to one estimate, continuation-of-

coverage mandates increase retirement hazards by 32 percent (Gruber and Madrian, 1995).

Although these studies document the relationship between the availability of health insurance coverage and retirement, little is known about the effects of insurance costs on labor supply. The principal contribution of this paper is to quantify the relationship between health insurance premium costs and retirement behavior. Since individual health insurance is generally available for purchase for those without employer-sponsored coverage, the primary advantage of employer-sponsored benefits is their relatively low cost. By focusing on the role of premium costs in the retirement decision, we were able to assess how policy proposals that would change the cost of health insurance for retired workers would affect early retirement decisions.

METHODS

We quantified the effects of RHI offers on labor force withdrawals by computing the premium cost associated with retirement. We defined this cost as the monthly increase in premium expenses that workers would pay if they retired, compared to what they would pay if they remained at work, and computed the net present value of the stream of costs from the age at which workers were first observed until they reached the Medicare eligibility age, adjusting for survival probabilities. Retirement decisions were assumed to be influenced by premium costs, and we measured their effect on retirement behavior by including the net present value of the premium costs among the covariates in a multivariate model of retirement. Finally, we simulated the impact of various health reform initiatives by re-computing premium costs under different scenarios and using the estimated coefficients from the model to predict retirement rates.

Data

The primary source of data for our study was the HRS, a longitudinal survey of middle-

aged Americans fielded by the Institute for Social Research (ISR) at the University of Michigan. In 1992, the HRS interviewed a nationally representative sample of men and women ages 51 to 61 and their spouses (regardless of age) and has resurveyed them every two years. The baseline survey gathered data on 12,652 persons in 7,702 households, including oversamples of blacks, Hispanics, and Florida residents. The second wave of interviews was successfully completed in 1994 for 11,596 respondents. Individuals were questioned about a wide variety of subjects, including their health insurance, health status, employment, hours of work, pension coverage, income, and demographics.[2] We restricted our sample to respondents ages 55 to 61 at study baseline, because younger workers may have reported RHI offers but may not have been eligible to begin receiving benefits.[3] We also restricted the sample to wage and salary workers who were employed full-time (35 or more hours per week) at wave 1 and who were re-interviewed in wave 2. We eliminated workers who reported Medicare or Medicaid coverage at wave 1, because the handful of full-time workers with public health insurance are likely to exhibit unusual retirement patterns. After dropping cases with missing data, our sample consisted of 968 men and 796 women.[4]

One of the innovative features of the HRS is the availability of information on retiree health benefits. Respondents were asked a detailed series of questions about their current health

[2]For additional information about the HRS, see Juster and Suzman (1995).

[3]Respondents were not asked the age at which they could begin to collect benefits.

[4]Of the 12,652 respondents interviewed in wave 1, cases were dropped from our sample because they lacked all financial information (95 cases), were not within our age range of 55 to 61 (6,818), were not working full-time (2,814), were self-employed (471), were not re-interviewed in wave 2 (190), were proxy interviews (185), received public insurance (24), were missing health insurance information (247), or were missing other information (44).

insurance coverage and the availability of those benefits after they retired. In wave 1, they were asked whether they had any ESI coverage, and if so whether they received it through their own current or former employers or through the spouse's employer. They were also asked about premium sharing — whether costs were paid entirely by the respondent or spouse, entirely by the employer, or shared between the employer and the insured. For respondents with ESI, information was collected about whether the plan was also available to retirees, whether retirees paid all, some, or none of the costs, and whether the plan covered the spouses of retirees. Respondents who reported that they would pay some but not all of the premium costs after retirement were asked whether retired employees paid higher, lower, or the same health insurance costs as other employees. Finally, respondents were asked whether they purchased any non-group health insurance coverage or were covered by Medicare, Medicaid, or other government health plans. In wave 2 (but not in wave 1), information was collected on the level of contributions that workers made to their employers for their ESI coverage. Respondents who did not report any type of coverage were assumed to be uninsured.[5]

Premium cost of retirement

Health insurance information from the HRS was combined with data from other surveys to create a measure of the monthly premium cost associated with retirement. As summarized in table 1, the premium cost depends on insurance coverage. The premium cost to retire was set equal to zero for workers who were uninsured or who purchased non-group coverage, since they would face no change in the insurance alternatives available to them when they retired. Workers

[5]The HRS also includes an employer survey that collects detailed information about each insurance plan offered. However, these data are not yet available, and ISR staff report that the quality of the data is poor.

who had ESI through their own employer but were not offered RHI benefits would be eligible for COBRA continuation coverage for 18 months, after which they would have to purchase non-group insurance policies to remain insured before reaching the Medicare-eligibility age. Those with ESI and RHI offers often face higher premium costs upon retirement because RHI coverage often involves more cost sharing between the employer and employee than ESI coverage.

Summing the costs each month from the time retirement is being considered until the initial receipt of subsidized Medicare benefits, the net present value of the stream of costs, NPVRCOST, can be expressed as:

$$NPVRCOST = \sum_{i=j+1}^{T} (R_i - W_i)\left(\frac{1+c}{1+r}\right)^{i-j} p_i$$

where R_i is the monthly premium cost in month i when retired, W_i is the monthly premium cost in month i when working, j is the worker's current age in months, c is the monthly projected increase in premium costs from the current period until the worker reaches Medicare-eligibility age, r is the real interest rate, p_i is the probability that the worker will survive from the current age j (in months) to age i (in months), and T is the eligibility age for subsidized Medicare benefits, expressed in months. Under current law, when workers can begin receiving Medicare benefits at 65, T would equal 780.[6]

The value of c was derived from national health expenditure data (Cowan and Braden, 1997). From 1990 to 1995, the compound annual real growth rate in individual health insurance premiums and employee contributions to private premiums was 6.0 percent, or 0.487 percent per

[6]We assumed that both R_i and W_i were paid with after-tax dollars, although some persons are able to make before-tax contributions to their health plans while working. Because we were unable to account properly for the preferred tax treatment that some health insurance costs receive, we may have underestimated the premium cost of retirement for some workers.

month. Gender-specific survival rates were drawn from Social Security Administration (SSA) life tables for the 1936 birth cohort. Annual survival rates were transformed into monthly rates using linear interpolation. We used an annual interest rate, *r*, of 2.8 percent, corresponding to the intermediate assumptions used by SSA actuaries in 1998 when evaluating the OASDI trust funds (Social Security Administration, 1998). This annual rate translates into a monthly real interest rate of 0.23 percent.

The computation of the premium cost to retire was quite data intensive. To calculate premium costs while working for those with ESI coverage, regardless of RHI offers, we needed information on the premium contributions workers made for their health benefits as active employees. For workers with RHI offers, we needed data on their contributions for their post-retirement health benefits to compute the cost of insurance after retirement. For workers with ESI coverage but not RHI offers, we needed data on total premium costs so that we could compute the cost of continuation coverage, which is set by law at 102 percent of the total premium. We also needed information on non-group premiums for these workers in order to estimate their insurance costs after their continuation coverage runs out. Although the HRS is a rich source of data on health insurance coverage and costs for workers approaching retirement, information on these costs was not generally available in the HRS and had to be imputed from other data sources.

Employee ESI Premium Contributions

We imputed wave 1 ESI premium contributions for all respondents with ESI coverage in wave 1.[7] Using data from wave 2 of the HRS, which includes information on premium

[7]We used predicted premiums for all respondents, even for those with valid premiums in wave 2

contributions, we estimated a multivariate model of employee premium contributions and used the coefficients from the model to generate predicted values for wave 1. The model was estimated on a sample of 1,140 age-eligible full-time workers with ESI coverage who reported making contributions for their health benefits. The dependent variable was the log of the employee premium contribution. The independent variables included gender, education, union membership, marital status, firm size, industry, occupation, interaction terms between firm size and industry, and variables indicating whether the spouse was covered by the plan and whether the employee paid the entire premium.[8] Logged predictions were re-transformed assuming a normal distribution. The premiums were deflated from 1994 dollars to 1992 dollars, assuming a 6 percent annual premium inflation rate. Wave 1 ESI premiums were set to zero for respondents who reported that their employers paid the full premium.

Total ESI Premiums

We used data from the Health Insurance Association of America's (HIAA) 1991 Employer Survey to impute total premium costs for workers with subsidized ESI coverage. We modeled the log of total premiums as a function of firm size, region, industry, employee premium share, and type of coverage (single or family) for a sample of 5,303 plans in 2,126 firms. The model was used to predict total premiums for our HRS sample. Predictions were bounded from below by the level of employee contributions to the plan. An inflation factor of 6 percent was

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who reported that costs had not changed between the waves. By using predicted instead of actual values, we eliminated the problem that arises when differences across workers in actual contributions reflect differences in the quality and comprehensiveness of coverage.

[8]Information on type of insurance plan (e.g., health maintenance organization, preferred provider organization, or fee for service) and whether extra payments were required to visit specialists was collected in wave 2. Although we expected that this information would improve the explanatory value of the model, it was not included because the questions were not asked in wave 1.

used to translate premiums from 1991 to 1992 dollars. For workers in our HRS sample who reported paying the entire premium themselves, we simply set total ESI premiums equal to their contributions.

Employee RHI Premium Contributions

We combined information from the HRS and a survey of health plans to estimate premium contributions for RHI coverage. For respondents who reported that they would pay the entire RHI premium themselves, we set contributions equal to the total imputed premium amount. For those who reported that their employers would pay the entire RHI premium, we set contributions equal to zero. For those who reported that they would pay part of their RHI premium and that their contributions would be the same as (or, in rare cases, less than) their current ESI contributions, we set their RHI contributions equal to their ESI contributions. The premium cost of retiring was equal to zero for these respondents. Finally, for those who reported that their RHI contributions would exceed their ESI premium contributions, we computed RHI contributions by inflating ESI contributions using data from the 1995 Foster Higgins National Survey of Employer-Sponsored Plans. Based on estimates from the Foster Higgins survey, which provides information on the fraction of premium costs covered by employee contributions for ESI and RHI plans, we set RHI contributions equal to 217 percent of ESI contributions for workers in firms with fewer than 500 employees and to 242 percent of ESI contributions for workers in firms with 500 or more employees.

Non-Group Insurance Premiums

We imputed non-group premium costs for our sample from a survey of Blue Cross and Blue Shield plans conducted by the Urban Institute in 1991. Each respondent in our sample was assigned the mean premium cost within the appropriate gender, region, and five-year age category. Premium costs were computed for a major medical plan that offered single coverage with a $500 deductible, a 20 percent copay rate, and a pre-admission screening requirement. Because most non-group plans are risk rated (Chollet and Kirk, 1998), persons with serious health problems are likely to face substantially higher premiums than those in good health. We incorporated health-based premium differentials into our analysis by inflating our premium estimates by 50 percent for persons who reported minor or moderate chronic health conditions in wave 1 of the HRS and by 200 percent for persons who reported more severe health conditions.[9] Because these adjustments are somewhat arbitrary, we computed two alternative measures of NPVRCOST, one based on health-adjusted non-group premiums and another based on non-group premiums that were not adjusted for health status, and reported the results of our policy simulations for both measures.

Retirement Models

To measure the impact of the premium cost to retire on labor force attachment at midlife, we estimated probit models of retirement. The dependent variable was set equal to one if the respondent was retired at wave 2, zero otherwise. We defined workers as having retired if they reported working fewer than 20 hours per week at the time of the wave 2 interview and they were

[9]Mild to moderate conditions included hypertension, mild diabetes, history of cancer, mild lung disease, mild heart condition, stroke without consequences, mild psychiatric condition, arthritis, ulcers, kidney problems, and asthma. Severe conditions included severe diabetes, severe lung disease, severe heart condition, stroke with health consequences, and severe psychiatric problems.

not actively looking for employment. Approximately 17.4 percent of men working full time at wave 1 and 18.8 percent of women working full time at wave 1 had retired by the time of the wave 2 interview, about two years later. The key independent variable in the model was NPVRCOST. We estimated our models both before and after adjusting NPVRCOST to account for the higher non-group premiums that persons with medical conditions would be likely to face, as described above. Because retirement behavior may differ by gender, we estimated models separately for men and women.

In addition to NPVRCOST, independent variables in the model included measures of health, demographic, and economic characteristics of respondents. All variables were measured as of wave 1. Health was measured by a series of binary variables indicating the respondent's self-reported overall health status (very good, good, fair, and poor, with excellent as the omitted reference group). We experimented with other measures of health, including history of medical problems, the presence of functional impairments, body mass index, and the presence of work disability, but none of these measures had consistent significant effects in our models. Age was captured by a series of dummy variables indicating single year of age at wave 1, with age 55 as the reference group. We used a series of age indicators instead of a linear measure of age in our model in order to capture possible discrete changes in the probability of retirement that may occur at certain ages, such as the age at which one first becomes eligible for Social Security benefits. The model also controlled for differences in marital status (measured by dummies for divorced or separated, widowed, and never married, with currently married as the reference group), race (measured by dummies for black and Hispanic, with white and other races as the reference group), and education. Education was measured with three binary variables, indicating

less than a high school diploma, a high school diploma, and some college but less than four years of college, with four years of college as the omitted reference group.

Economic variables in the model included financial wealth, non-wage income, pension wealth, pension accruals, and union status. Financial wealth was defined as non-retirement wealth, excluding housing equity. Non-wage income included income from interest, dividends, rent, alimony, retirement benefits from previous jobs, and government transfers plus the earnings of the spouse. We expected that financial wealth and non-wage income would both increase the probability of retirement. Defined benefit (DB) pension wealth was computed from information collected from pension providers. Summary plan descriptions, which provide information about retirement ages, vesting requirements, mandatory employee and employer contributions to the plan, cost of living adjustments, Social Security offsets, and the formulas on which pension benefits are based, were collected from plan administrators for HRS respondents who reported participating in pension plans. Estimates of DB pension wealth based on these parameters were computed using software recently developed by ISR. We did not use the provider data to generate estimates of defined contribution (DC) pension wealth. Instead, for our measure of DC pension wealth we used self-reported estimates of the balance in the DC account at the time of the survey, which appear to be more reliable than provider-based estimates of DC wealth (Johnson, Sambamoorthi, and Crystal, 1998). Since DB and DC wealth may have different effects on retirement, we included both measures in our models. The models also included measures of annual accruals of pension wealth for both DB and DC plans, defined as the incremental increase in pension wealth associated with working an additional year. For DB plans, accruals were estimated using the ISR software. For DC plans, accruals were measured by

the level of employer contributions to the pension plan during the year. We expected that accruals would be negatively related to retirement, because larger accruals increase the return to working, whereas the level of pension wealth would be positively related to the retirement hazard because greater levels of wealth are likely to increase the demand for leisure. For cases in which information on pension wealth or accruals was missing, we set the pension variable equal to the median value in the sample and set a missing value indicator equal to unity.

Predicted Effects of Selected Reform Proposals

We used the results of our models to predict the effects on early retirement decisions of policy proposals to permit persons to buy into Medicare at age 62, provide tax breaks for insurance premium costs, and extend the length of time that employers must offer continuation coverage to their former employees. We modeled each policy initiative as a change in the premium cost to retire and, using the new premium costs, predicted retirement rates from our models for workers with ESI coverage but without RHI offers. We assessed the impact of proposed policy changes by comparing predicted retirement rates under the new rules with predicted rates under the current system. We focused on the effects for workers with ESI coverage but not RHI offers because our modeling approach captured only price effects for each policy initiative, and only workers with ESI coverage but not RHI offers would experience sizable changes in insurance prices. For workers with RHI offers, implementing a Medicare buy-in program or increasing continuation coverage would not generally reduce insurance costs, because costs under the new policies would typically exceed the costs of RHI coverage and changes in the tax code would have only small effects. Insurance costs do not change at retirement for workers without ESI coverage under the current system or under any of the

proposed policy initiatives we considered, so our model would predict that they have no effect on retirement rates. In fact, however, they may exert income effects on the labor supply of workers without health benefits, and thus increase retirement rates. Allowing workers without ESI coverage to buy into Medicare at age 62 and thus avoid the expensive non-group insurance market, for example, increases the amount of income available after insurance purchases; they may choose to consume that income by taking more leisure time and retiring at younger ages.

For the Medicare buy-in program, the key determinant of NPVRCOST (and thus the impact of the program on the retirement decision) is the price that individuals would be charged for participating in the program. As the buy-in premium falls, NPVRCOST falls and predicted retirement rates rise. Because of the sensitivity of our results to the level of the buy-in premiums, we considered several alternative pricing schemes. The first plan we evaluated would charge persons ages 62 to 64 $300 per month in 1999 to receive Medicare benefits, plus monthly supplemental premiums from ages 65 to 84. The supplemental premiums would equal $10 times the number of years that the individual participated in the program. Thus, persons who bought into Medicare every month between the ages of 62 and 64 would pay monthly supplemental premiums of $30 from age 65 to 84. This premium is similar to the level estimated by the Congressional Budget Office (1998) to ensure cost neutrality, a condition set by the Clinton administration when it proposed making Medicare benefits available to the near elderly. Because some members of our sample reached age 62 before 1999 and others did not reach age 62 until later, we adjusted the Medicare premium cost by 6 percent per year so that it was constant in real terms for all respondents.

We also considered several other pricing schemes for the buy-in program. We examined

the effects on retirement when the buy-in option was priced at $200 per month and at $400 per month in 1999, while the monthly supplemental premium was set equal to $30 for persons who elected to buy into the Medicare programs for three years. Because monthly $30 supplements over 20 years substantially increase the costs to individuals of participating in the buy-in program, we also estimated retirement effects when the supplemental premiums were eliminated. In another scenario, we investigated the effects of simply extending subsidized Medicare benefits to persons at age 62 by setting the price equal to the real monthly premium charged to elderly Medicare beneficiaries for supplemental coverage for physician services in 1992. The Medicare premium in 1992 was $31.80, which is equivalent to $47.82 in 1999 when premium costs are inflated by 6 percent per year. Finally, we considered the effects of a means tested pricing scheme similar to the Specified Low-Income Medicare Beneficiary (SLMB) program that pays Medicare premiums for low-income elderly persons. We set the entire Medicare buy-in premium (both the pre-65 payments and the post-65 supplements) equal to zero for persons with family income in the bottom 20 percent of the family income distribution.[10] Persons in the top 80 percent of the distribution would pay the entire monthly cost, which we set equal to $300 before age 65 and $30 from age 65 to 84, themselves,.

We also modeled the effects on early retirement behavior of federal tax breaks for insurance costs. First we considered a tax credit of up to $1,000 per person for premium costs that individuals paid either to employers to offset the cost of ESI, RHI, or COBRA continuation coverage or directly to insurance companies. For workers who pay sufficiently large premiums,

[10]The SLMB program pays the Medicare Part B premiums for elderly with income at or below 120 percent of the poverty level, making roughly the poorest 20 percent of elderly persons eligible for assistance.

the tax credits could reduce annual insurance costs by up to $1,000. Moreover, the annual premium cost to retire could fall by up to $1,000 for workers who pay no premiums as active employees but pay at least $1,000 in premiums after retirement.

We also considered a change in the federal tax law that would permit the full deductibility of premium costs from taxable income, even for taxpayers who do not itemize their deductions. We used federal tax rates for 1991 and assumed that all workers took the standard deduction and all married couples filed jointly. To compute the net present value of the premium cost to retire when premium expenses were tax deductible, we needed to project taxable income each year up to age 65 for every respondent, first under the assumption that they remained at work until age 65 and then under the assumption that they retired at the time of the wave 1 interview. When respondents remained at work, we assumed that taxable income remained constant in real terms up to age 65. When respondents retired, we assumed that they no longer received any labor earnings, that those with employer-sponsored pension plans began to collect pension income, and that their other non-wage income, including spousal earnings, remained constant in real terms. Annual income from DB plans was estimated from information collected from pension providers, as described above. Annual income from DC pension plans was estimated by annuitizing the reported balance in the plan account at the time of the wave 1 survey.

Finally, we simulated the effects of increasing the number of months that employers were mandated to provide post-employment continuation coverage to former employees. We considered an increase to 36 months, from the current mandate of 18 months. Increasing the continuation coverage period would decrease NPVRCOST for workers with ESI coverage but without RHI offers. The size of the effect would depend upon the cost difference between non-

group coverage and unsubsidized group coverage.

RESULTS

Table 2 reports mean monthly premiums by type of health insurance for the full-time wage and salary workers in our sample. Fully 66 percent of men and 50 percent of women had ESI coverage with RHI offers.[11] About one in six men and one in five women had ESI coverage that did not continue after retirement. Only 7 percent of men received insurance through their spouses' employment, compared with 16 percent of women. Only a few percent of full-time workers purchased non-group coverage as their sole source of health insurance, while about 7 percent of workers were uninsured.

Although workers who were offered RHI faced substantial increases in premium costs when they retired, the cost increase was much larger for workers with ESI only. Among men, we estimated that mean premium costs would rise by $96 in the first month of retirement for workers with RHI, compared with $189 for those with ESI only. The mean cost differential was even larger 19 months after the retirement decision, once mandated continuation coverage ran out for some retired workers. We estimated that at month 19 male workers with RHI offers would pay on average $105 more per month for health insurance if retired than they would pay if they remained at work. By contrast, we estimated that mean premium costs at month 19 for men with ESI but not RHI offers were $248 higher when retired than when working, based on estimates of non-group premiums that were not risk rated, and $364 higher when our estimates of non-group

[11]Because our sample was restricted to respondents who were re-interviewed at wave 2, and respondents who left the sample had lower rates of insurance coverage than workers who remained in the sample, RHI coverage rates observed in our sample were somewhat higher than the rates observed in a random sample of full-time workers. Our estimates also understate the percentage of workers with ESI but not RHI because we dropped respondents with ESI who did not know whether their employers offered RHI.

premiums were inflated for those with health problems. The mean value for NPVRCOST was $9,477 for men with RHI offers, compared with $21,625 for men with only ESI when estimates were based on premiums that were not risk rated and $29,858 for men with only ESI when estimates were based on risk-rated non-group premiums. Premium costs were somewhat lower for the women in our sample, but the differentials between workers with ESI only and workers with RHI were similar to those observed for men.

Retirement rates by baseline health insurance coverage, as reported in table 2, were consistent with our hypothesis that increases in premium costs associated with retirement affect the timing of withdrawals from the labor force. For both men and women, workers with ESI coverage and without RHI offers were less likely to retire during the two-year period between the first two waves of interviews than workers with other types of coverage or no insurance at all. For example, among men working full time at wage and salary jobs at wave 1, only 11 percent with ESI coverage only were retired by wave 2, compared with 20 percent with RHI offers. Among women working full time at wave 1, 12.6 percent with ESI coverage only were retired at wave 2, compared with 19.4 percent with RHI offers.

Table 3 reports the results of the retirement models. The first two columns report parameter estimates for men and women when the estimates of NPVRCOST were not adjusted by health status, and the second two columns report estimates when non-group premium costs were adjusted upward for respondents with health problems. In both cases, premium costs significantly reduced the probability of retirement. When non-group premium costs were not adjusted for differences in health status, our model predicted that a $1,000 increase in NPVRCOST would reduce the probability of early retirement for men by 0.25 percentage points

and for women by 0.41 percentage points. The estimated elasticity of retirement with respect to changes in NPVRCOST was −0.14 for men and −0.19 for women.[12] When the model used risk-adjusted non-group premium costs, the estimated elasticities were −0.11 for men and −0.14 for women.

The results of our model imply that RHI offers substantially accelerate early retirement. To evaluate the impact of RHI offers, we assigned the mean value of NPVRCOST among men and women with RHI offers to members of the sample with ESI coverage only and examined the change in predicted retirement rates. If men with ESI coverage but without RHI offers faced the mean premium cost to retire faced by men with RHI offers, all else equal, their predicted retirement rates would increase by 25 percent, based on our model in which non-group premiums were not adjusted for health differences. Retirement rates for women with ESI coverage only would rise by 28 percent if they faced the same premium cost to retire as women with RHI offers, all else equal, when our model did not risk adjust non-group premiums. The estimated effect of RHI offers on early retirement rates was similar when our model incorporated risk adjusted non-group premiums.

Other variables in our model affected the probability of retirement in expected ways. Workers in fair and poor health were much more likely to retire than workers who reported excellent health. Retirement rates increased sharply at baseline ages 60 and 61, perhaps because workers who reached these ages at baseline would have been eligible for Social Security retirement benefits by the time of the second wave of interviews when retirement status was

[12]For men, a 10 percent decrease in NPVRCOST, equivalent to $976, would increase the hazard of retirement by 0.24 percentage points, equal to 1.4 percent of the predicted baseline probability of retirement of 17.3 percent.

determined. Men, but not women, with limited education were significantly more like to retire than men who had completed four or more years of college. For both men and women, DB pension wealth significantly increased the probability of retirement, while DC pension wealth and pension accruals did not have significant effects. [13] We found no evidence of racial differences in retirement or of differences by marital or union status.

Effects of a Medicare Buy-In Program

Table 4 reports the estimated effects of the Medicare buy-in program on early retirement rates for workers ages 55 to 61 with ESI coverage who were not offered RHI coverage by their employers. Because the estimated effects of extending Medicare benefits to individuals as young as 62 are sensitive to the prices participants would be charged, we considered several different pricing schemes. Under a plan similar to the one proposed by the Clinton administration that would attempt to cover the costs of the expansion through premiums paid by newly eligible beneficiaries, the impact on retirement rates would be quite small. If premiums were set at $300 per month (in 1999 dollars) from ages 62 to 64 and $30 per month from ages 65 to 84 for those who participated in the Medicare program since age 62, we estimated that two-year retirement rates for men with ESI coverage and without RHI offers would increase from 12.57 percent to 12.85 percent, when our model did not account for the risk rating of non-group premiums. In other words, our model predicted that retirement rates for these men would increase by 0.28 percentage points, or by 2.2 percent of the baseline retirement rate. For women, we estimated

[13] Other studies, however, have found that pension accruals significantly reduce the probability of retirement (Samwick, 1998; Stock and Wise, 1990a, 1990b). The high frequency of missing data on DB pension accruals in our sample may explain our failure to find significant effects. About 20 percent of the cases in our sample included missing data. For these cases, we set pension accrual equal to the median accrual in the sample. However, this approach introduces additional measurement error into our estimates, biasing the coefficient on accruals toward zero.

that the cost-neutral expansion of Medicare would raise retirement rates by 0.22 percentage points, or by 1.6 percent of the baseline retirement rate. Estimated effects were somewhat larger when the non-group premiums incorporated into the model were risk rated, but the impact remained small. For example, we estimated that retirement rates for men would increase by 0.79 percentage points, or by 6.4 percent, with the introduction of a cost-neutral Medicare buy-in plan when our model adjusted non-group premiums by health status. As expected, the effect on retirement would be even smaller if prices were set at higher levels.

The impact on early retirement rates would be substantial, however, if the Medicare buy-in program were heavily subsidized. If premiums were set at the level paid by elderly Medicare beneficiaries for supplemental coverage of physician services, equal to $31.80 per month in 1992, or $47.82 per month in 1999 assuming 6 percent premium inflation per year, the Medicare expansion program would increase early retirement rates by up to 19 percent for men and up to 23 percent for women. These results also suggest that the current Medicare program may have large effects on retirement rates for persons ages 65 and older. Means testing the buy-in program could also strongly encourage retirement for the near elderly. If premiums were fully subsidized for persons in the bottom 20 percent of the income distribution but designed to be cost neutral for those in the top 80 percent, then retirement rates would increase by 17 percent for men and 18 percent for women. Retirement effects would also be substantial if the monthly cost at ages 62 to 64 were set at $300 but the supplemental monthly costs from ages 65 to 84 were eliminated. We estimated that retirement rates under this scenario would increase by 10 percent for men and 11 percent for women when the non-group premiums in our model were adjusted for differences in health status.

We tested the sensitivity of our results to our choice of the discount rate. Some evidence suggests that individuals discount the future at rates that far exceed the prevailing rate of interest (Dreyfus and Viscusi, 1995). Changes in the assumed discount rate could have significant effects on NPVRCOST and on the estimated impact of the buy-in program. In particular, the behavior of individuals who heavily discount future costs might be largely unaffected by premiums costs that were deferred for 20 years, when participants reached their eighties. In fact, when we increased the discount rate to 20 percent from 2.8 percent, our model predicted larger retirement effects for buy-in plans that continued to charge participants monthly premiums until age 84. Assuming a 20 percent discount rate, we estimated that a Medicare buy-in program that charged $300 per month at ages 62 to 64 and $30 per month from ages 65 to 84 would increase early retirement rates for men and women with ESI but without RHI offers by 8 percent when non-group premiums in the model were adjusted for health status, up from about 6 percent under the assumption of a 2.8 percent discount rate. For buy-in plans in which all premiums were paid by age 65, however, predicted early retirement rates were largely unaffected by changes in the assumed discount rate.

Effects of Tax Relief and Extensions of Continuation Coverage

Table 5 reports the effects of tax incentives for health insurance costs and of an extension in federally mandated continuation coverage on early retirement rates for men and women ages 55 to 61 who received ESI coverage from their employers but were not offered RHI coverage. The effects of each reform initiative were small. Granting a tax credit of up to $1,000 per year for health insurance premium costs would increase early retirement rates by no more than 4 percent for men and 8.2 percent for women, according to our model. The tax credit would have

only a limited impact on retirement because most persons would receive the bulk of the credit even if they remained at work, and thus it would not substantially reduce the premium cost to retire. For men with ESI who were not offered RHI coverage, for example, the mean premium cost when working was $59 per month, or $708 per year. When retired, most men with ESI who were not offered RHI coverage could take the full $1,000 tax credit, since mean monthly premium costs were at least $189. Thus, the annual premium cost to retire would fall by only $292 on average, reducing NPVRCOST by only 9.5 percent when the model did not adjust for non-group premiums for differences in health status.[14] The estimated effects would be even smaller if the model incorporated risk-rated non-group premiums. With risk rating, NPVRCOST would still fall by $2,044 for the average male worker with ESI and without RHI offers, but this decline would equal only 6.9 percent of mean NPVRCOST, because estimated NPVRCOST was larger when non-group premiums in the model were risk rated. Tax deductions for health insurance costs would also have small effects on early retirement rates, because the mean marginal tax rate in our sample for workers with ESI and not RHI offers was only 15.9 percent after retirement.

Increasing the number of months for which employers must provide COBRA coverage to workers who leave employment from 18 to 36 would have small effects on early retirement rates. Because the cost of continuation coverage is quite high, extending continuation coverage would increase early retirement rates by no more than 3 percent for men and 5 percent for women,

[14]Since the mean age for men (and women) in our sample was 58, the tax credit would reduce NPVRCOST for seven years. If the premium cost to retire were reduced on average by $292 per year, NPVRCOST would fall by $2,044, equal to 9.5 percent of the mean NPVRCOST of $21,625 for men with ESI who were not offered RHI when the model did not adjust non-group premium costs for differences in health status.

according to the results from our model. Our results are consistent with previous studies that have documented low take-up rates for COBRA coverage (Flynn, 1994).

CONCLUSIONS

Many workers who receive health benefits from their employers face steep increases in health insurance costs when they retire before the Medicare eligibility age, either because they replace subsidized ESI coverage with unsubsidized continuation coverage from their employer and eventually with expensive non-group health insurance, or because employers who offer RHI coverage provide less generous subsidies for health benefits to active workers than to retirees. We found that post-retirement increases in premium costs significantly reduced the probability of early retirement within our sample of full-time workers ages 55 to 61 at baseline. The estimated elasticity of retirement with respect to changes in the net present value of the stream of health insurance costs ranged from –0.11 to –0.14 for men and from –0.14 to –0.19 for women, depending on how we estimated the cost of non-group premiums after retirement.

Given the substantial difference in average premium costs faced by workers who receive RHI offers from their employers and by workers with ESI coverage who were not offered RHI benefits, our results imply that RHI offers increase retirement rates by about 25 percent for men and 28 percent for women. Our findings are consistent with other studies that have found that the potential loss of ESI coverage can lock workers into particular employment relationships (Madrian, 1994), although our estimate of the impact of RHI coverage on retirement behavior is somewhat smaller than the effects detected by other researchers. For example, using the same data from the HRS, Karoly and Rogowski (1998a) concluded that RHI offers increased early retirement rates by 62 percent for men. However, they included workers as young as 51 in their

sample, did not fully control for differences in costs across plans, and employed a different definition of retirement than we did. Whereas we defined retirement as a reduction in hours from 35 hours or more per week at wave 1 to fewer than 20 hours per week in wave 2, Karoly and Rogowski classified workers as being retired only if they ceased work altogether and described themselves as retired at wave 2. As a result, it is difficult to make direct comparisons between the two studies.

Policy simulations based on our model indicate that the introduction of a Medicare buy-in program, tax breaks for the purchase of health insurance, and extensions in federally mandated continuation coverage would have only limited effects on early retirement rates. For example, if income tax credits of up to $1,000 were granted for the purchase of health insurance, retirement rates among full-time workers with ESI and not RHI offers would increase by somewhere between 1 percent and 4 percent for men and between 5 percent and 8 percent for women. The estimated effects on retirement rates of providing full tax deductions for the purchase of health insurance were similar, while the estimated effects of doubling the number of months during which employers would be required to provide unsubsidized continuation coverage would be even smaller. The effects of extending Medicare benefits to persons as young as 62 would depend on the level of premiums participants were charged. If the costs were heavily subsidized and rates were similar to the premiums charged to elderly beneficiaries, we estimated that a reduction in the Medicare eligibility age to 62 would increase early retirement rates for workers with ESI but not RHI offers by up to 19 percent for men and 23 percent for women. The effects would be much smaller if the buy-in program were designed to be cost neutral, in which case we estimated that early retirement rates would increase by no more than 6 percent for men and

women. The limited impact of these health insurance reforms, with the exception of a subsidized Medicare expansion, stems from their generally small effects on post-retirement premium costs for most workers.

For a number of reasons, our estimates may understate the effects of health insurance reform on retirement decisions. Because of the many imputations that were incorporated into the calculation of insurance costs, our estimates of the premium cost of retirement are undoubtedly imprecise. As a result, measurement error will bias downward the size of our estimated coefficients on the premium cost to retire in our models. In addition, variation in premium costs does not capture all of the differences in types of coverage. RHI coverage, ESI coverage, non-group policies, and Medicare may vary by the types of services they cover and the level of deductibles and copayments they impose on plan participants. By assuming that RHI and non-group coverage differ only in the premiums they charge, we likely understated the effects of RHI offers on retirement. We also failed to account for risk aversion in our models. Workers who are not offered RHI coverage from their employers may be concerned about their access to the non-group insurance market after retirement. Although HIPAA requires insurers to cover persons who lose group coverage and forbids pre-existing condition exclusions, it does not limit the price that insurers can charge. As a result, workers may be worried that their premiums may become unaffordable if they develop a health problem during retirement, especially among those who are particularly risk averse. For these workers, the availability of Medicare benefits at age 62 may be quite appealing and may substantially accelerate their retirement plans. Finally, the income effects associated with a reduction in the Medicare eligibility age and the other health insurance reforms we considered may encourage retirement for workers without job-related health

insurance benefits.

Although small and possibly understated, our estimated effects of public and private health insurance reforms are larger than estimates of the impact of other reform proposals on early retirement rates. Most studies of Social Security reform find quite limited effects on retirement. Mitchell (1991), for example, concluded that raising the normal retirement age from 65 to 67 would lead men to delay retirement by about only three months, as would increasing the penalty for early retirement. Gustman and Steinmeier (1991) estimated that increasing the Social Security delayed retirement credit from 3 percent to 8 percent per year and eliminating the Social Security earnings test would increase labor force participation rates by about 3.5 percent per year for persons ages 65 to 69 and would raise the average retirement age by only about three weeks. Mandating that all employers offer defined benefit pension plans to their workers would increase the cumulative probability of retirement between the ages of 50 and 70 by 4.9 percentage points (Samwick, 1998). If the baseline retirement probability is 81 percent, then this tremendous expansion in pension coverage would increase retirement rates by only 6 percent.[15] Judged by these standards, then, health insurance reforms can have relatively large effects on retirement, especially when the expansion of Medicare coverage to younger individuals is heavily subsidized.

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Table 1
Derivation of the Premium Cost to Retire

Baseline Health Insurance Coverage	Monthly Premium Cost to Retire
ESI from own employer, RHI available	RHI premium – ESI premium, until Medicare eligibility age
ESI from own employer, RHI not available	COBRA premium – ESI premium for first 18 months Non-group premium – ESI premium, from month 19 until Medicare eligibility age
ESI from spouse's employer[a]	Zero
Private Non-Group	Zero
Uninsured	Zero

a. Derivation of the premium cost to retire assumes that retirement decisions for husbands and wives are independent of each other.

Table 2
Health Insurance Premium Costs and Early Retirement Rates, by Type of Insurance Among Workers Ages 55 to 61[a]

Type of insurance	Percentage of sample	Mean monthly premium when working	Additional mean monthly premium when retired, month 1[c]	Costs when non-group premiums are not risk rated: Additional mean monthly premium when retired, month 19[c]	Costs when non-group premiums are not risk rated: Mean NPV of premium cost to retire	Costs when non-group premiums are risk rated[b]: Additional mean monthly premium when retired, month 19[c]	Costs when non-group premiums are risk rated[b]: Mean NPV of premium cost to retire	Percentage who retire within two years
Men								
ESI and RHI offer	65.5	59	96	105	9,477	105	9,477	19.9
ESI only	16.4	59	189	248	21,625	364	29,858	10.7
Spouse ESI	7.4	80	0	0	0	0	0	15.3
Private non-group	3.3	171	0	0	0	0	0	15.6
Uninsured	7.3	–	0	0	0	0	0	12.7
Women								
ESI and RHI offer	50.0	37	87	95	8,544	95	8,544	19.4
ESI only	22.0	35	151	217	19,277	363	30,077	12.6
Spouse ESI	16.0	75	0	0	0	0	0	22.1
Private non-group	5.2	186	0	0	0	0	0	24.4
Uninsured	6.9	–	0	0	0	0	0	23.6

a. The sample was restricted to full-time wage and salary workers ages 55 to 61 at study baseline. Workers with public insurance and those who did not know whether they had RHI were also eliminated from the sample. Workers were considered to be retired if they reported working fewer than 20 hours per week and were not actively seeking employment at the time of the wave 2 interview. Costs and insurance status were measured at the time of the baseline interview. Estimates were based on information from 968 men and 796 women. ESI = employer-sponsored insurance. RHI = retiree health insurance.

b. Non-group insurance premiums were adjusted upward by 50 percent for those with mild to moderate health conditions and by 200 percent for those with more serious health problems, as described in the text.

c. Additional monthly premiums were computed as the amount respondents were estimated to pay if retired minus the amount they would pay if working, at the specified month after the baseline interview.

Source: Authors' computations from the 1992-1994 Health and Retirement Study.

Table 3
Probit Estimates of Retirement[a]
(Standard errors are in parentheses and marginal effects are in brackets)

	When Non-Group Premiums Are Not Risk Rated		When Non-Group Premiums Are Risk Rated	
	Men	**Women**	**Men**	**Women**
NPV of premium cost to retire[b]	-0.111**	-0.165***	-0.073*	-0.096**
	(0.050)	(0.062)	(0.039)	(0.041)
	[-0.025]	[-0.041]	[-0.017]	[-0.024]
Defined benefit pension				
Wealth[b]	0.009**	0.022***	0.010**	0.022***
	(0.004)	(0.009)	(0.004)	(0.009)
	[0.002]	[0.006]	[0.002]	[0.006]
Accrual[b]	0.038	-0.073	0.032	-0.074
	(0.046)	(0.074)	(0.046)	(0.074)
	[0.008]	[-0.018]	[0.007]	[-0.019]
Missing value indicator	0.115	-0.098	0.117	-0.109
	(0.128)	(0.152)	(0.128)	(0.152)
	[0.026]	[-0.024]	[0.026]	[-0.027]
Defined contribution pension				
Wealth[b]	-0.004	-0.004	-0.004	-0.005
	(0.010)	(0.033)	(0.010)	(0.033)
	[-0.001]	[-0.001]	[-0.001]	[-0.001]
Missing wealth indicator	0.285*	-0.097	0.285*	-0.083
	(0.171)	(0.223)	(0.171)	(0.223)
	[0.064]	[-0.024]	[0.065]	[-0.021]
Accrual[b]	0.413*	0.294	0.402*	0.265
	(0.213)	(0.618)	(0.211)	(0.618)
	[0.093]	[0.074]	[0.091]	[0.066]
Missing accrual indicator	0.052	0.023	0.054	-0.003
	(0.182)	(0.240)	(0.182)	(0.240)
	[0.012]	[0.006]	[0.012]	[-0.001]
Net financial wealth[b]	0.002	0.002	0.002	-0.0004
	(0.001)	(0.002)	(0.001)	(0.025)
	[0.0004]	[0.0004]	[0.0004]	[-0.0001]
Non-wage income[b]	0.023	-0.002	0.025	0.001
	(0.026)	(0.025)	(0.026)	(0.002)
	[0.005]	[-0.001]	[0.006]	[0.0003]
Race				
Black	-0.255	0.121	-0.248	0.117
	(0.162)	(0.148)	(0.162)	(0.149)
	[-0.058]	[0.030]	[-0.056]	[0.029]
Hispanic	-0.199	0.175	-0.192	0.178
	(0.208)	(0.252)	(0.208)	(0.252)
	[-0.045]	[0.044]	[-0.043]	[0.045]
[Reference: White or other]	…	…	…	…

(Continued)

Table 3 (continued)

	When Non-Group Premiums Are Not Risk Rated		When Non-Group Premiums Are Risk Rated	
	Men	**Women**	**Men**	**Women**
Age				
[Reference: 55]	…	…	…	…
56	-0.191	0.095	-0.183	0.108
	(0.196)	(0.207)	(0.195)	(0.206)
	[-0.043]	[0.024]	[-0.041]	[0.027]
57	-0.105	0.153	-0.093	0.159
	(0.195)	(0.210)	(0.195)	(0.209)
	[-0.024]	[0.038]	[-0.021]	[0.040]
58	0.129	0.351*	0.140	0.385*
	(0.192)	(0.202)	(0.192)	(0.200)
	[0.029]	[0.088]	[0.032]	[0.096]
59	-0.005	0.377*	0.017	0.395*
	(0.206)	(0.206)	(0.205)	(0.205)
	[0.001]	[0.094]	[0.004]	[0.099]
60	0.496***	0.431**	0.519***	0.457**
	(0.181)	(0.217)	(0.180)	(0.216)
	[0.112]	[0.108]	[0.118]	[0.115]
61	1.009***	0.823***	1.025***	0.845***
	(0.201)	(0.228)	(0.200)	(0.226)
	[0.228]	[0.206]	[0.232]	[0.212]
Marital Status				
[Reference: Currently married]	…	…	…	…
Divorced or separated	0.236	-0.242	0.248	-0.225
	(0.201)	(0.159)	(0.201)	(0.158)
	[0.053]	[-0.060]	[0.056]	[-0.056]
Widowed	0.652	-0.222	0.669	-0.200
	(0.434)	(0.191)	(0.433)	(0.191)
	[0.147]	[-0.055]	[0.152]	[-0.050]
Never married	0.492*	0.100	0.518*	0.117
	(0.297)	(0.270)	(0.295)	(0.271)
	[0.111]	[0.025]	[0.117]	[0.029]
Union member	0.183	0.182	0.183	0.169
	(0.113)	(0.131)	(0.113)	(0.131)
	[0.041]	[0.045]	[0.041]	[0.042]

(Continued)

Table 3 (continued)

	When Non-Group Premiums Are Not Risk Rated		When Non-Group Premiums Are Risk Rated	
	Men	**Women**	**Men**	**Women**
Education				
Did not complete high school	0.511***	-0.354*	0.520***	-0.347
	(0.180)	(0.212)	(0.180)	(0.212)
	[0.115]	[-0.088]	[0.118]	[-0.087]
High school graduate	0.438***	-0.067	0.437***	-0.070
	(0.157)	(0.164)	(0.156)	(0.164)
	[0.099]	[-0.017]	[0.099]	[-0.018]
Some college	0.114	-0.138	0.118	-0.135
	(0.179)	(0.179)	(0.179)	(0.179)
	[0.026]	[-0.034]	[0.027]	[-0.034]
[Reference: College graduate]	…	…	…	…
Self-Reported Health Status				
[Reference: Excellent]	…	…	…	…
Very good	0.098	-0.171	0.097	-0.165
	(0.147)	(0.150)	(0.147)	(0.150)
	[0.022]	[-0.043]	[0.022]	[-0.041]
Good	0.259*	-0.053	0.264*	-0.035
	(0.147)	(0.153)	(0.146)	(0.153)
	[0.058]	[-0.013]	[0.060]	[-0.009]
Fair	0.401**	0.394**	0.414**	0.427**
	(0.201)	(0.196)	(0.202)	(0.196)
	[0.091]	[0.098]	[0.094]	[0.107]
Poor	1.195***	0.652*	1.213***	0.667**
	(0.272)	(0.335)	(0.274)	(0.334)
	[0.270]	[0.163]	[0.275]	[0.167]
Number of months between the waves	0.037	-0.041	0.036	-0.042
	(0.023)	(0.027)	(0.023)	(0.027)
	[0.008]	[-0.010]	[0.008]	[-0.010]
Intercept	-2.667***	-0.163	-2.695***	-0.214
	(0.554)	(0.604)	(0.553)	(0.602)
N	968	796	968	796
Log likelihood	-386.4	-349.8	-387.2	-350.6

a. The sample was restricted to full-time wage and salary workers ages 55 to 61 at study baseline. Workers with public insurance and those who did not know whether they had RHI were also eliminated from the sample. Workers were considered to be retired if they reported working fewer than 20 hours per week and were not actively seeking employment at the time of the wave 2 interview. All independent variables were measured at the time of the baseline interview.

b. Measured in $10,000.

* $0.05 \leq p < 0.1$; ** $0.01 \leq p < .05$; *** $p < 0.01$

Source: Authors' computations from the 1992-1994 Health and Retirement Study.

Table 4
Estimated Effects of Medicare Buy-In Option on Retirement Rates for Workers Ages 55 to 61 with ESI and without RHI Offers

Monthly Buy-In Premium[a]		Non-Group Premiums Not Risk Rated		Non-Group Premiums Risk Rated	
Ages 62-64 ($)	Ages 65-84 ($)	Predicted Probability of Retirement	Percentage Change in Retirement Probability	Predicted Probability of Retirement	Percentage Change in Retirement Probability
Men					
Current system	Current system	12.57%	…	12.44%	…
47.82[b]	0	14.90	18.54%	14.69	18.09%
200	0	13.94	10.90	14.06	13.02
200	30	13.15	4.61	13.50	8.52
300	0	13.41	6.68	13.70	10.13
300	30	12.85	2.23	13.23	6.35
400	0	13.04	3.74	13.40	7.72
400	30	12.61	0.32	12.99	4.42
Means tested[c]	Means tested[c]	14.66	16.63	14.52	16.72
Women					
Current system	Current system	13.83	…	13.86	…
47.82[b]	0	17.05	23.28	16.87	21.72
200	0	15.42	11.50	15.92	14.86
200	30	14.32	3.54	15.10	8.95
300	0	14.62	5.71	15.39	11.04
300	30	14.05	1.59	14.76	6.49
400	0	14.23	2.89	14.97	8.01
400	30	13.87	0.29	14.52	4.76
Means tested[c]	Means tested[c]	16.34	18.15	16.33	17.82

a. Medicare premiums refer to the price that would be paid in 1999. Premiums paid in later (earlier) years are increased (decreased) by 6 percent per year.
b. In 1992, the Medicare premium for supplemental coverage of physician services was $31.80 per month, or $47.82 per month in 1999 assuming 6 percent premium inflation per year.
c. Under the means tested pricing scheme, individuals would pay $300 per month at ages 62 to 64 and $30 per month from ages 65 to 84, except for those in the bottom 20 percent of the income distribution, who would pay nothing.

Source: Authors' computations from the 1992-1994 Health and Retirement Study.

Table 5
Estimated Effects of Tax Incentives for Health Insurance Costs and Extension of COBRA Period on Retirement Rates for Workers Ages 55 to 61 with ESI and without RHI Offers

	Non-Group Premiums Not Risk Rated		Non-Group Premiums Risk Rated	
	Predicted Probability of Retirement	Percentage Change in Retirement Probability	Predicted Probability of Retirement	Percentage Change in Retirement Probability
Men				
Current system	12.57%	…	12.44%	…
Tax credit[a]	13.19	3.90%	13.91	1.15%
Tax deduction[b]	13.10	4.22	12.95	4.10
Extension of COBRA[c]	12.71	1.11	12.82	3.05
Women				
Current system	13.83	…	13.86	…
Tax credit[a]	15.06	8.17	16.43	4.84
Tax deduction[b]	14.71	6.36	14.65	5.70
Extension of COBRA[c]	14.15	2.31	14.49	4.55

a. The tax credit plan would provide up to $1,000 per year per person in tax credits for health insurance costs.
b. Under the tax deduction plan, all health insurance costs would be fully deductible from taxable income.
c. Under the COBRA extension plan, the number of months of mandated continuation coverage provided by employers to former workers would be extended from 18 months to 36 months.

Source: Authors' computations from the 1992-1994 Health and Retirement Study.