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Abstract

This paper tests the Rational Expectations (RE) hypothesis regarding retirement expectations of married older American couples, controlling for sample selection and reporting biases. In prior research we found that individual retirement expectation formation was consistent with the Rational Expectation hypothesis, but in that work spousal considerations were not analyzed. In this research we take advantage of panel data on expectations to test the RE hypothesis among married individuals as well as joint expectations among couples. We find that regardless of whether we assume that married individuals form their own expectations taking spouse's information as exogenous, or the reports of the couple are the result of a joint expectation formation process, their expectations are consistent with the RE hypothesis. Our results support a wide variety of models in economics that assume rational behavior for married couples.

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1. Introduction

Most of the literature on joint retirement is concerned with tests of the appropriate behavioral model to explain actual retirement behavior of married couples. There are numerous competing theoretical hypotheses regarding joint retirement behavior that vary in their treatment of the relationship between the utility functions of the two individuals. The motivating empirical phenomenon is that husbands and wives tend to retire together, but there is no conclusive evidence in favor of any of the competing hypotheses, which defend either some type of bargaining model or a leader-follower model, in explaining this phenomenon (Hurd 1990, Gustman and Steinmeier 1994 and 2000, Blau 1997 and 1998, Blau and Riphahn 1998, Blundell, Chiappori, Magnac, and Meghir 1998, Berloffa 1999, Coile 1999, Costa 1999, Benítez-Silva 2000, Blau and Gilleskie 2001, Maestas 2001) Most of these researchers seem to coincide on the importance of complementarity of leisure, and on the relevance of going beyond the individual-based model. In this paper we do not directly address the reasons behind the joint outcomes for married couples, but instead by analyzing joint expectation formation we focus on how the planning behind those future outcomes evolves.

We examine how couples expectations of retirement evolve over time, and ask whether they do in accordance with rationality. We test models of Rational Expectations (RE) using all five available waves of the Health and Retirement Study on married couples' plans for retirement. We do this for married individuals taking the spouse's information as exogenous as well as for joint expectations formation. This is the first study we are aware of that tackles the issue of joint retirement expectations directly. We find that the results are consistent with the RE hypothesis after controlling for measurement error and sample selection biases.

There has been relatively little work done on expectation formation. Bernheim (1990) focuses on expectations formation to test individuals' rationality, and he cannot reject the hypothesis of strong rationality, meaning that only new information affects individual changes of expectations regarding Social Security receiving benefit levels.[1] In a prior paper we build on Bernheim's model of expectations formation, and on the tradition of Muth (1961), Lucas (1972), and the rational expectations revolution, to argue that testing whether past retirement expectations are a sufficient statistic for current retirement expectations is indeed a test of the RE hypothesis.[2]

In that work we also use the full longitudinal Health and Retirement Study, and use Instrumental Variables and a modified selection corrected IV estimator to deal with issues of selection and reporting biases. In that work we find that individual plans are consistent with the RE hypothesis. But one weakness of that work is that we treated each member of a married couple individually and only controlled for marital status, which was often significant in explaining retirement outcomes and expectations. In this work we extend that research to test for RE among married couples.

Notice, that we do not directly address the issue of how to include the spouse's information into a behavioral model of retirement. We do not ask how the responses to retirement expectation in the survey came about, but rather test for the rationality in those responses. In doing so, we simply implement a RE test that suggests that all of the information should be captured in the previous period's expectations, even after controlling for the spouse's expectations, and that regardless of the process that each family member, or the family as a whole, used to come up with an expectation of retirement (either as the result of a bargaining process, or one of them being the

[1] There is a growing body of research that is using expectations variables for a variety of research endeavors, including and analysis of the connection between Social Security expectations and retirement savings (Dominitz, Manski, and Heinz 2001, Lusardi 1999), the relationship between retirement expectations and retirement outcomes (Bernheim 1989, Dwyer and Hu 1999, Disney and Tanner 1999, Coronado and Perozek 2001, Hurd and Retti 2001, Forni 2002, Dwyer 2002, and Mastrogiacomo 2003), the analysis of fertility expectations and pregnancy outcomes (Walker 2003), the analysis of wage and income expectations (Dominitz and Manski 1996 and 1997, and Das and van Soest 1997 and 2000), and to understand consumption patterns after retirement (Haider and Stephens 2003, and Hurd and Rohwedder 2003).

[2] See Benítez-Silva & Dwyer (2003) for a discussion of the connections of this approach with the traditional rational expectations literature, Benítez-Silva, Dwyer, Gayle, and Muench (2003) for an extension of the results using different expectations questions with different populations and data sets, McCallum (1980) for a survey of the early contributions, and Manski (2003) for a recent discussion of the importance of analyzing expectations formation.

leader and the other the follower, or some other process), that the relationship between the retirement expectations of husbands and wives evolve rationally over time.

Our results support the growing literature on dynamic modeling, and models that rely on some form of a rationality assumption to solve for, simulate, and eventually estimate the parameters of an economic model of behavior. Most of those models when applied to household retirement decisions assume rational expectations, and also assume that some type of joint model is more appropriate, our results validate the underlying assumption of joint rationality and therefore support the household level approach to retirement research.

The conceptual model and the econometric specifications are presented in the next section. Section 3 provides information about the data used in the empirical analysis, and Section 4 reports our main findings. Section 5 presents some concluding remarks and discusses avenues of future research.

2. A Model of Expectations Formation and a Rational Expectations Test

Suppose first, that an individual and an econometrician are trying to predict a variable X that the individual has decided will be determined by a function of a sequence of random variables: [3]

$$X = h(\omega_1, \omega_2, ..., \omega_T). \qquad (1)$$

The sequence of vector-valued variables inside the parenthesis will be observed by the individual at time periods $t=1,2,...,T$. Then the individual will take action X after some or all the ω_t's have been observed.

[3] This borrows, in part, from Benítez-Silva and Dwyer (2003).

Let $\Omega_t = \{\omega_t\}_{t=1}^{t}$ be the information known at period t and let $\omega_t = \left(\omega_t^1, \omega_t^2\right)$, where all of ω_t is observed by the individual, but only ω_t^1 is observed by the econometrician. Let then $\Omega_t^1 = \left\{\omega_t^1\right\}_{t=1}^{t}$. Then we can define

$$X_t^e = E\langle X \,|\, \Omega_t \rangle, \qquad (2)$$

where E is the expectations operator. This is the most commonly used representation of the RE hypothesis, which takes as the rational expectation of a variable its conditional mathematical expectation (Sargent and Wallace 1976).[4] This guarantees that errors in expectations will be uncorrelated with the set of variables known at time t.

Variables included in the vector representing the information set Ω, come from models of individual retirement behavior (see for example Lumsdaine and Mitchell 1999) and might include socio-economic and demographic characteristics. Using the law of iterated expectations and assuming that the new information is correctly forecasted by agents (its conditional distribution not just its mean), from (2) we get:

$$E\left\langle X_{t+1}^e \,\middle|\, \Omega_t \right\rangle = E[E\left\langle X \,\middle|\, \Omega_t, \omega_{t+1} \right\rangle \,|\, \Omega_t] = E\left\langle X \,\middle|\, \Omega_t \right\rangle = X_t^e, \qquad (3)$$

where ω_{t+1} represents information that comes available between periods t and $t+1$. Without this additional assumption expression (3) would not be correct. We are going to test this assumption jointly with the more standard RE hypothesis, once we also assume linearity of the process presented in (3). Notice that the assumption of correct forecasting is in essence no different from the assumption in the early RE literature; namely that forecast errors are normally distributed with mean zero, in a specification that regresses outcomes of a particular market variable on its expectations and a constant.

[4] Schmalensee (1976) using experimental data emphasizes the importance of analyzing higher moments of the distribution of expectations. Due to data limitations we are unable to do so in our analysis.

Then from (3) we can write the evolution of expectations through time as

$$X^e_{t+1} = X^e_t + \eta_{t+1}, \qquad (4)$$

where $\eta_{t+1} = X^e_{t+1} - E[X^e_{t+1} \mid \Omega_t]$, and therefore $E(\eta_{t+1}|\Omega_t)=0$. Notice that η_{t+1} is a function of the new information received since period *t*, ω_{t+1}. From this characterization of the evolution of expectations we can test the RE hypothesis with the following regression:

$$X^e_{t+1,i} = \alpha + \beta X^e_{t,i} + \gamma\,\Omega^1_{t,i} + \varepsilon_{t+1,i}, \qquad (5)$$

where α is a constant, and γ is a vector of parameters that estimate the effect of information in period *t* on period's *t+1* expectations. The RE hypothesis implies that $\alpha=\gamma=0$, and $\beta=1$. A weak RE test, in the terminology of Lovell (1986) and Bernheim (1990), assumes that γ is equal to a vector of zeros, and tests for $\alpha=0$ and $\beta=1$—effectively testing whether expectations follow a random walk. The strong RE test is less restrictive and also tests for $\gamma=0$.

In this setting married individuals are pooled with those divorced, single or never married, and only a binary indicator for marital status is included in (5) as part of Ω^1. However, in reality, spouse's information is likely to matter, including the spouse's retirement expectation. Assuming that the retirement expectation reported by the spouse is a summary statistic for the variables determining that expectation, we can try to integrate that response into the model presented above.

We can test the RE hypothesis in the same way as for individuals if the spouse's information and plans are exogenous to the individual's process. That means that if the individual takes the spouse's information as given and then forms expectations over that information, the spouse's variables can be treated as any other exogenous variables and the RE test remains essentially the same, where we would be estimating

$$X^e_{t+1,i} = \alpha + \beta X^e_{t,i} + \gamma_{s1}\Omega^{1,s1}_{t,i} + \gamma_{s2}\Omega^{1,s2}_{t,i} \quad \varepsilon_{t+1,i}, \qquad (6)$$

where we will assume that the information set of the variables corresponding to the spouse, $\Omega^{1,s2}$, are summarized by the retirement expectation response we observe in the sample.[5] The predictions of the model are still essentially the same as in the individual level model, $\alpha=\gamma_{s1}=\gamma_{s2}=0$, and $\beta=1$.

However, if we believe that the spouse's information is summarized by the retirement expectation he or she reported, and we believe that that expectation may be the product of the couple's joint planning, then the spouse's information would be endogenous in the specification of the RE test presented in (6). The error term would be correlated with both the spouse's information as well as the previous own expectation, thereby biasing the coefficient of interest, in this case β.

If couples plan jointly, then a more appropriate test of rationality would test for the rationality of joint expectations, so rather than starting with an expected retirement age for a given individual X_t^e, we will use a measure of joint retirement age, in our case the difference between the number of years remaining until the person reaches the expected retirement, for each of the spouses. For couples of the same age, this measure is equal to zero when they plan to retire at the same time, and different from zero when they plan to retire one year apart or more. We will then be estimating modifications of equations (5) and (6), in this case

$$(X^e_{t+1,s1}-Age_{t+1,s1})-(X^e_{t+1,s2}-Age_{t+1,s2})=\alpha+\beta((X^e_{t,s1}-Age_{t,s1})-(X^e_{t,s2}-Age_{t,s2}))+\gamma_{s1}\Omega^1_{t,s1}+\gamma_{s2}\Omega^1_{t,s2}+\varepsilon_{t+1,i} \quad (7)$$

where a weak RE test will assume that $\gamma_{s1}=\gamma_{s2}=0$, and test whether $\alpha=0$ and $\beta=1$. The strong RE test will also test whether $\gamma_{s1}=\gamma_{s2}=0$ along with the tests of the constant and the main coefficient of interest, β.

[5] However, we do provide as sensitivity analysis, results where the spouse' variables are directly included in the estimation.

Notice, again, that the results of these tests cannot directly shed light on the debate of what is the underlying model followed by households to decide when each partner will retire. What we are testing is whether joint expectations evolve over time in a way consistent with rational expectations. Those expectations can be the product of any of the underlying models presented in the literature. However, it is also important to notice that all those models assume the rationality of those expectations, and therefore our test is highly relevant and potentially valuable to that literature.

Econometric Specifications

Estimating (5), (6), and (7) is in principle straightforward but the likely presence of measurement error in the dependent variable and its lag and sample selection, complicate the methodology. We are concerned about reporting errors that may be correlated with measurement errors in other factors. Some assumptions underlie the identification of the coefficients of interest in the presence of these two econometric concerns. First, we will be assuming that the measurement error that individuals incur in is in no way correlated with the rationality of their expectations formation process but has more to do, for example, with the differences across individuals in the true meaning of retirement. In the case of the selection problem we are making the implicit assumption (and this is true in any econometric application that tries to solve the selection bias problem à la Heckman 1979, and wants to make a statement about the general population under analysis) that those that do not respond the question of interest would use the same process to analyze information if they were to actually answer the question as those that answer the question. Meaning that those that we do not observe answering the expectations questions are not following a completely different model (maybe irrational) to decide their retirement ages, but instead that for a number of observable and unobservable reasons they did not report our dependent variable.

Here we follow the methodology presented in Wooldridge (2002, p. 567) to consistently estimate the effect of previous expectation on current expectation, and from (5) we write

$$X^e_{t+1,i} = \alpha_1 + \beta X^e_{t,i} + \gamma_1 Z_{t,1i} + \varepsilon_{t+1,1i}, \quad (8)$$

$$X^e_{t,i} = \alpha_2 + \lambda_1 Z_{t,1i} + \gamma_2 Z_{t,2i} + \varepsilon_{t,2i}, \quad (9)$$

$$Y_i = \alpha_3 + \gamma_3 Z_{t,3i} + \varepsilon_{3i}, \quad (10)$$

where we first estimate the selection equation (10) using a probit specification, where Y_i is equal to one if both the expectation in period t and the expectation in period $t+1$ are observed, which means that the individual answers a question about his or her future retirement. Z_3 in equation (10) includes all the exogenous variables and any exclusion restriction of the selection equation with respect to the structural equation (8). We then consistently estimate (8) by performing a modified 2SLS procedure, where the first stage includes as instruments all the exogenous variables used in (10), the Inverse Mills' ratio from the probit equation, and any additional instruments, Z_2 in (9), the validity of which will be tested.

It is straightforward to see how equations (8) to (10) will be modified in order to estimate (6) and (7) in the presence of measurement error and sample selection. If we assume the spouse's information, in this case the retirement expectations reported by the spouse, is exogenous then we would estimate the system below by a modified 2SLS procedure

$$X^e_{t+1,i} = \alpha + \beta X^e_{t,i} + \gamma_{s1} Z^{s1}_{t,i} + \gamma_{s2} Z^{s2}_{t,i} \quad \varepsilon_{t+1,i}, \quad (11)$$

$$X^e_{t,i} = \alpha_2 + \lambda_1 Z^{s1}_{t,i} + \lambda_2 Z^{s2}_{t,i} + \gamma_2 Z_{t,2i} + \varepsilon_{t,2i}, \quad (12)$$

$$Y_i = \alpha_3 + \gamma_3 Z_{t,3i} + \varepsilon_{3i}, \quad (13)$$

as before Z_3 in equation (13) includes all the exogenous variables and any exclusion restriction of the selection equation with respect to the structural equation (11).

Then, if we estimate the joint expectations model in the presence of measurement error and sample selection we estimate the following system of equations using the same modified 2SLS methodology

$$(X^e_{t+1,s1} - Age_{t+1,s1}) - (X^e_{t+1,s2} - Age_{t+1,s2}) = \alpha + \beta((X^e_{t,s1} - Age_{t,s1}) - (X^e_{t,s2} - Age_{t,s2})) + \gamma_{s1} Z_{t,s1} + \gamma_{s2} Z_{t,s2} + \varepsilon_{t+1,i} \quad (14)$$

$$(X^e_{t,s1} - Age_{t,s1}) - (X^e_{t,s2} - Age_{t,s2}) = \alpha + \lambda_1 Z^{s1}_{t,i} + \lambda_2 Z^{s2}_{t,i} + \gamma_2 Z_{t,2i} + \varepsilon_{t,2i} \quad (15)$$

$$Y_i = \alpha_3 + \gamma_3 Z_{t,3i} + \varepsilon_{3i}, \quad (16)$$

where the notation borrows from the other two characterizations of the problem.

In all cases our objective is to estimate consistently and efficiently the main parameter of interest, β, and in this paper we concentrate in the estimation of that parameter in equations (11) and (14).

3. Data

The Health and Retirement Study (HRS) is a nationally representative longitudinal survey of 7,700 households headed by an individual aged 51 to 61 as of the first round of interviews in 1992-93. So far five waves of data are available, and we use all of them in our analysis.[6] The primary purpose of the HRS is to study the labor force transitions between work and retirement with particular emphasis on sources of retirement income and health care needs. It is a survey conducted by the Survey Research Center (SRC) at the University of Michigan and funded by the National Institute on Aging. The data for the respondents are merged from wave 5 backwards to waves 4, 3, 2, and 1, and we construct a set of consistent variables on different sources of income, financial and non-financial wealth, health, health insurance, and socio-economic characteristics that will be assigned to each decision maker appropriately.

We include any observation for respondents that are married and both individuals are working, full time or part time, in any wave and non-employed (but searching for jobs) that report retirement plans. We exclude respondents who do not report retirement plans for more than two consecutive years and for whom we observe relevant information, which results in around 11,000 person-period observations once missing values in the main variables of interest are considered. We construct relevant dependent and independent variables for each wave.[7]

In each wave respondents are asked when they plan to fully or partially depart from the labor force.[8] They are also asked if they thought much about retirement. These questions are not mutually exclusive, but most of the people who have not thought about retirement do not report an expected age.[9] A non-trivial number of individuals report they will never retire, although these same people often change their minds at some point and report an age. The analysis could potentially be sensitive to how we treat "never retire" since we need to put in some older age that we select arbitrarily. We have assigned an age of 77 for those who never retire (estimated longevity), but our results are robust to screening out this group and correcting for the selection into it.

Expected retirement ages are distributed similarly to actual retirement ages with peaks at ages 62 and 65 as well as a peak for the bunching at 77 for those who never plan to retire. Over time these expectations converge to between 62 and 65 with fewer people maintaining plans of retirement before age 62 or after age 65. Table 1a and 1b provide an analysis of how these expectations compare with a number of retirement measures for the population of HRS respondents (see also for example Panis 2002). Interestingly, expectations are much more concentrated on the traditional peaks than actual retirement which, except for a measure that uses the age at which individuals start to receive Social Security, is much smoother. In any case,

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[6] In the last two months, wave 6 (collected in 2002) of the data has become available as a preliminary release. For the moment we are not integrating this new wave of information in our estimations.
[7] If there are missing values for one wave we use the prior wave of information, but we only go back one wave.
[8] In wave 1 they were only asked about a full departure.
[9] Many of them report that they will never retire. If they have not given it any thought, and they say they will never retire, we treat their expected retirement age as missing. If they give a retirement age we treat them as non-missing.

besides the apparent focal points that ages 62 and 65 play when people form expectations, it seems clear that retirement expectations are measuring retirement itself.

As indicators of economic status, we construct variables of net worth and household wealth. We also control for income for the respondent. We use health limitations, self-ratings, as well as a number of disease indicators and activities of daily living to control for health status. We also use the self-reported probability of living to age 85 as a measure of the individual's time horizon, which may be correlated with health status. Hurd and McGarry (1995) find this variable to be highly correlated with own health status and parent mortality.

Table 2 displays descriptive statistics on the pooled sample by sample selection criteria. Those who are in the sample are more educated and in higher socioeconomic groups than those who have not thought about retirement. They are in slightly better health and their spouse's are significantly healthier. The average expected age of retirement is 64 for those who have thought about it and 65 for those who have not (a possible focal point given Social Security policy).

4. Empirical Results

Rational Expectations of Married Individuals

Table 3 reports the weak and strong RE tests for the full sample of married individuals. In these models we assume that the spouse's information is exogenous to the formation of expectations of the married individual. The data support the weak and strong RE hypotheses only in the augmented models that correct for measurement error in the report of expected retirement age, and also in the model that also corrects for the possible selection bias, resulting in a corrected IV specification.[10]

[10] The findings are robust across many specifications and empirical techniques including panel data methods. Much of the individual component is explained by time-invariant variables (there is no remaining individual component in a random effects model if we exclude these covariates). The justification for including these time-invariant components

Notice that we perform an F-test based on the null hypothesis that β=1 in equation (11), to test the RE hypothesis. We obtain coefficients for beta of 1.08 for the weaker test, which cannot reject the hypothesis that expectations follow a random walk. For the pooled OLS estimation the weak test is effectively a unit root test, and as such, and following the literature on testing unit roots in panel data surveyed by Bond, Nauges, and Windmeijer (2002), we have to perform a correction to obtain the appropriate critical value. However, this matters very little since the unit root hypothesis is soundly rejected.

In the OLS specification of the strong test, the spouse's previous expected retirement age plays a significant role in explaining future expectations along with own prior expectations. However, once we control for the measurement error that is potentially biasing these results, the effect of the spouse's information is not significantly different from zero, therefore this additional restriction of the RE hypothesis cannot be rejected, which suggests that the informational content of that variable is already embedded in the respondent's own expected retirement report.

For the strong test we estimate the model of equations (11) to (13), using the Corrected IV procedure. The beta parameter is estimated to be equal to 1.059, which fails to reject the RE hypothesis. Notice, however, that selection bias does not seem to be a major problem, and that the IV estimator delivers essentially the same results. We also report in the table tests that show that we cannot reject that we have robust instruments and that the overidentification in the 2SLS is

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in the test is because they may be correlated with other time-varying unobservables. However, due to collinearity problems it was necessary to remove age from the list of covariates in the second stage of the IV and corrected IV procedure. As Vella (1998) discusses, this might be due to the fact that age in our sample has a fairly small range, leading to the apparent linearity of the inverse Mills' ratio. We are therefore assuming that age is a proxy for the information set, and only matters in terms of making you more or less likely to think about retirement, but does not directly affect the expected retirement age.

correct.[11] In fact the reported results are the product of robustly estimating the system of equations via GMM, which provides robustness against unknown forms of heterokedasticity.

The strong test includes information available at time *t* that should not be significant after controlling for time *t* expectations. Significance would imply that this factor was not incorporated in the previous period's expectations and implies underutilized information. After controlling for sample selection and measurement error we find that most of these factors are no longer significant, in fact only wealth is. The joint hypothesis that all the coefficients are equal to zero cannot be rejected at any traditional level of significance in the IV or the corrected IV specifications.[12]

The objective behind instrumental variables estimation here is to correct for potential measurement error in the reported expected age of retirement at time *t*, as explained in more detailed in Section 2. Since people are reporting expectations over uncertain events, we expect some degree of reporting error that may be correlated with unobserved factors. In fact, Bernheim (1988) finds that expectations are reported with noise. Like in Bernheim (1990), we correct for this problem using instrumental variables analysis. The instruments must be correlated with the expected retirement age but not with the error term or any new information relevant to the *t+1* expectation. We use time *t* subjective survival to age 85 probabilities and an indicator of smoking behavior as instruments and exclusion restrictions for expected retirement age, and in the specifications of the strong test we also use the individual's age and the age of his or her spouse as instruments. In the selection corrected IV, the inverse Mills' ratio is included in the estimation, along with the rest of the exogenous variables from the selection equation, as suggested by

[11] For a discussion of how to test the robustness of instruments and the overidentifying restrictions see Bound, Jaeger, and Baker (1995), Staiger and Stock(1997), Stock, Wright, and Yogo (2002), and Baum, Schaffer and Stillman (2002).
[12] It is true, however, as in Bernheim (1990) that this is trivially the case if individuals never adjust their expectations. But plenty of adjustment goes on in the data, and it seems implausible that all can be blamed on measurement error.

Wooldridge (2002).[13] The IV and the selection corrected IV specification deliver similar results.[14] This is not surprising, given the lack of statistical significance of the Inverse Mills' Ratio. The first stage results, reported in Tables A.2.1 and A.2.2., in the Appendix, suggest that selection bias is present in the estimation of the weak test. Table A.1., also in the Appendix, presents the results of the selection equation used in estimating the corrected IV specification.

For completeness, Table A.3., in the Appendix presents the results of estimating the same specifications as in Table 3, but instead of including the expected retirement age of the spouse as an explanatory variable, we include a battery of spouse's variables. We can clearly see that the main results do not change much in this specification. Again, the IV results are the preferred ones, and the RE hypothesis cannot be rejected.

Tables 4 and 5 present results of the same specification as Table 3 but for males and females, respectively. Although we are assuming in all these specifications that the spouse's information is taken as exogenous, by estimating separate models for males and females we can analyze whether the spouse's expected retirement is internalized asymmetrically by the two genders. Almost all results are very similar in both tables, in both cases the predictions of the RE hypothesis cannot be rejected and the IV estimator is the preferred one. The main difference is that for males the spouse's retirement expectation as of time t still has informational content after controlling for own expected retirement, and a large number of covariates. This is not the case for females, where the point estimates are considerably smaller and very close to zero, but estimated

[13] The exclusion restrictions in the selection equation include indicators for whether the father and mother of the respondent reached retirement age. In the selection equation we have decided to only include covariates as of time **t**, we have experimented with including **t+1** variables, and also a battery of residuals of the regressions of **t+1** variables on their lagged values, which are then also included in the main equation. Although some coefficients in the main equation changed as a result of these modifications, the results reported in the paper are robust to this characterization of the selection process.

[14] Notice that in columns two and three of Tables 3 to 6, we do not report the adjusted R^2 measure of fit. This is common practice, but it is rarely mentioned in empirical work. These types of measures do not have independent significance in structural estimation à la IV, given that we are after estimating population parameters, which we

with much less precision. This result could suggest that males form their retirement expectations more independently of the partner's expectations than females. However, the weak statistical significance of the results, prevent us from drawing more definite conclusions.[15]

Rational Expectations Test using Joint Expectations

When we test the RE hypothesis of the evolution of joint expectations, defined as the difference in years to expected retirement between the couple, we obtain a similar pattern of results for the strong and weak test, and we are unable to reject the RE hypothesis once we control for measurement error, and the same is true when we also control for sample selection. In the IV specification the result of the weak test is a β coefficient of 0.989, and in the strong test is 1.048. From the table we can observe that due to the small number of observations the standard errors of the IV specification and the Corrected-IV specification are quite large, especially for the strong test in the Corrected-IV model, which leads to the result of not being able to reject the RE hypothesis. Notice, however, that in all cases the point estimates are very close to what the model under the RE hypothesis predicts.

It is important to emphasize that due to the way we are defining the dependent variable in this specification, the OLS estimates are likely to be pushed towards 0, since any change from no difference to some difference, or vice-versa, has to be fitted with a very small coefficient for the lagged difference. This problem is solved when using IV and the corrected IV technique. Finally, notice that from the coefficient of the Inverse Mills' ratio we can conclude that selection is not

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consider invariant to the particular way of identifying the parameters (instruments), not after minimizing a particular prediction problem. See Ruud (2000, p. 515-516 for a discussion)

[15] Tables A.4., A.4.1., and A.4.2., present the selection equation and first stage results of the IV and corrected IV results corresponding to the results presented in Table 4. Tables A.5., A.5.1., and A.5.2., do the same for the results presented in Table 5.

biasing the estimated coefficients, and therefore we can rely on the IV results as our preferred specification.

Both for the IV and the corrected IV specifications all specifications show that we have robust instruments, that the overidentification restrictions cannot be rejected, and that the rest of the coefficients that complete the RE hypothesis also have the hypothesized statistically significant magnitudes.

Finally, Tables A.6, A.6.1, and A.6.2, provide the selection equation used in the corrected IV estimator and the first stage results for the weak and strong tests of the IV and corrected IV specifications presented in Table 6.

5. Conclusions and Future Research

This is the first study we are aware of that analyzes joint retirement expectations. We use these expectations to test the RE hypothesis in the formation of retirement expectations for older married American couples using the HRS, and we cannot reject this hypothesis after controlling for reporting errors and sample selection. These results support the use of a wide variety of models that use this assumption to analyze joint retirement decisions, and for dynamic models of couples' decision making that are often heavily reliant on rational expectations assumptions.

Our research abstracts from the debate over the appropriate underlying model of decision making in the household, since our tests take the process followed to report a retirement expectation age by individuals and couples as given. We find that regardless of the process, the evolution over time of those expectations is consistent with the rational expectations paradigm. We believe there is no reason to expect that different underlying models of decision making at the household level would have different implications for the rationality of the retirement expectations reported by married couples.

The results in this analysis are meant to foster further discussion and research on the issues surrounding the role of expectations and rationality in economic modeling both for individuals and married couples. We have provided a methodology to test the validity of these variables, but we believe there are still a number of open questions that researchers in the area, including ourselves, will be tackling, we mention a few below.

Recent results using expectations for different populations, variables, and countries seem to indicate that both individuals and couples update their expectations, regarding micro level variables, according to the Rational Expectations hypothesis. However, at the same time the analysis of deviations between expectations and realizations seem to be pointing in the opposite direction. This can be considered a puzzle worthy of further research, which we conjecture is likely to be related to the fact that expectations and realizations of an apparently similar variable can be understood very differently by individuals, and also because issues of selection are not always appropriately modeled. Also, in some cases, and depending on the question of interest, the process of updating of expectations can be much more complex than what we have presented in this paper. For example, in the analysis of fertility expectations and realizations it is difficult to discard a model of learning as more appropriate, since individuals update their expectations regarding the number of children they want to have as they experience an initial realization, which is likely to bring many unexpected and almost impossible to predict events that can affect the expectations they report. This could potentially be going on among older married couples, as one member of the household maybe has a chance to observe how his or her partner deals with retirement before he or she decides to retire, but at the time an update of expectations is reported.[16]

In this paper we have concentrated on how individuals form expectations over a micro-level variable, which after all, they have some control over but that is affected by uncertainty over a number of dimensions. The challenge is to integrate this approach with the more traditional approach of forming expectations over market level or even macro variables. For example, how do expectations over possible Social Security reform affect the retirement behavior of individuals and couples? In recent work, Benítez-Silva and Heiland (2003) suggest that the presence of this expectations could explain part of the rather radical shift of the Social Security claiming age toward the Early Retirement Age, if this is the case it means that individuals are forming expectations over a variety of uncertain events, some of which are in part under their control, but some of them that can be considered macro level uncertainty. Some researchers have started to analyze the role of expectations over social insurance reform (Bütler 1999, and Phelan 1999) but the two types of expectations have been rarely modeled together.

Finally, a growing area of interest is trying to understand how these expectations can be used in models of individual behavior, paying special attention to the behavioral and econometric implications of including this type of variables in their models. The first efforts (which are still likely to continue for some time) have focused in validating the use of these variables, the next step is to use the informational content they provide to better identify our economic models of interest.

[16] See, for example, Pesaran (1987), and Evans and Honkapohja (2001) for illuminating expositions of learning models.

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Table 1.a. Distribution of Retirement Expectations and Actual Retirement. All respondents.

	W1	W2	W3	W4	W5	Self-R Ret.	Social Sec.	Fully Retired	Full and Partial Retirement
Age <50	0.19%	0.25%	0.14%	-	0.23%	9.11%	0.7%	11.8%	13.1%
Age 50	0.54%	0.34%	0.39%	0.22%	0.11%	2.1%	0.2%	2.51%	2.73%
Age 51-54	1.76%	1.14%	0.97%	0.9%	0.69%	11.3%	1.13%	12.7%	14.1%
Age 55	6.07%	4.7%	2.64%	2.24%	1.25%	6.4%	1%	6.18%	6.54%
Age 56-59	7.09%	7.34%	7.19%	5.43%	3.37%	**20.5%**	5.34%	**21.2%**	**21.5%**
Age 60	8.71%	9.71%	7.73%	7.13%	4.68%	7.4%	4.91%	7.22%	6.81%
Age 61	1.24%	1.1%	1.53%	1.48%	1.31%	7.51%	5.57%	6.56%	6.37%
Age 62	**30.8%**	**29.9%**	**27.5%**	**27.3%**	**22.6%**	**15.8%**	**49.4%**	**13.5%**	**12.9%**
Age 63-64	3.62%	4.79%	4.66%	5.29%	5.99%	9.63%	16.4%	9.18%	7.84%
Age 65	**19.2%**	**20.4%**	**23.1%**	**23%**	**23.3%**	**5.67%**	**10.6%**	**4.77%**	**4.54%**
Age >65	20.8%	20.3%	24.3%	27%	35.4%	4.54%	4.63%	4.36%	3.45%
Never	17.1%	15.8%	17.1%	14.8%	17.3%	-	-	-	-
# Obs.	3,708	3,256	2,808	2,230	1,753	5,346	3,967	4,902	6,404

W1 to W5: the expected retirement age reported in the respective rounds of data.
Self-R Ret.: reported retirement age when individuals are asked about their employment status.
Social Sec.: age at which they started to receive Social Security benefits.
Fully Retired: answer to a direct question regarding when did they fully withdrawn from the labor force.
Full and Partial Retirement: includes partial retirement in the above definition.

Table 1.b. Distribution of Retirement Expectations and Actual Retirement. Without the *nevers*.

	W1	W2	W3	W4	W5	Self-R Ret.	Social Sec.	Fully Retired	Full and Partial Retirement
Age <50	0.26%	0.29%	0.17%	-	0.28%	9.11%	0.7%	11.8%	13.1%
Age 50	0.65%	0.4%	0.47%	0.26%	0.14%	2.1%	0.2%	2.51%	2.73%
Age 51-54	2.12%	1.35%	1.16%	1.06%	0.83%	11.3%	1.13%	12.7%	14.1%
Age 55	7.32%	5.58%	3.18%	2.63%	1.52%	6.4%	1%	6.18%	6.54%
Age 56-59	8.56%	8.72%	8.68%	6.36%	4.07%	**20.5%**	5.34%	**21.2%**	**21.5%**
Age 60	10.5%	11.5%	9.32%	8.36%	5.66%	7.4%	4.91%	7.22%	6.81%
Age 61	1.5%	1.31%	1.85%	1.74%	1.59%	7.51%	5.57%	6.56%	6.37%
Age 62	**37.1%**	**35.6%**	**33.1%**	**32.1%**	**27.3%**	**15.8%**	**49.4%**	**13.5%**	**12.9%**
Age 63-64	4.36%	5.7%	5.63%	6.21%	8.49%	9.63%	16.4%	9.18%	7.84%
Age 65	**23.2%**	**24.2%**	**27.8%**	**27%**	**28.2%**	**5.67%**	**10.6%**	**4.77%**	**4.54%**
Age >65	4.42%	5.36%	8.68%	14.4%	21.9%	4.54%	4.63%	4.36%	3.45%
# Obs.	3,374	2.740	2,328	1.901	1,449	5,346	3,967	4,902	6,404

W1 to W5: the expected retirement age reported in the respective rounds of data.
Self-R Ret.: reported retirement age when individuals are asked about their employment status.
Social Sec.: age at which they started to receive Social Security benefits.
Fully Retired: answer to a direct question regarding when did they fully withdrawn from the labor force.
Full and Partial Retirement: includes partial retirement in the above definition.

Table 2. Summary Statistics by Sample Selection. Married Respondents

Variables	Thought About N=2,299	Not Thought N= 9,527
Retirement Plans and Outcomes		
Expected retirement age	64.029(6.423)	65.127(6.860)
Spouse's Expected retirement age	63.933(6.509)	64.872(6.727)
Employee	0.804(0.397)	0.716(0.451)
Self employed	0.146(0.353)	0.203(0.402)
Financially Knowledgeable	0.502(0.500)	0.503(0.500)
Economic factors		
Net worth (in $100,000)	2.761(4.550)	2.665(5.552)
Housing wealth (in $100,000)	0.840(0.879)	0.806(1.541)
Respondent's Income (in $1,000)	31.515(55.536)	27.834(40.366)
Has a private pension	0.670(0.470)	0.548(0.498)
Health Insurance		
Employer Provided	0.687(0.464)	0.631(0.482)
Retiree	0.817(0.387)	0.812(0.391)
Government	0.034(0.181)	0.058(0.234)
Private	0.176(0.381)	0.182(0.386)
No health insurance	0.033(0.179)	0.078(0.267)
Spouse	0.331(0.471)	0.325(0.469)
Health factors		
Health limitation	0.184(0.388)	0.182(0.386)
Good-Very Good-Excellent Health	0.896(0.305)	0.874(0.331)
Doctor visits	4.751(6.018)	4.885(7.051)
Probability of living to age 85	0.447(0.296)	0.459(0.303)
High blood pressure	0.181(0.385)	0.193(0.394)
Diabetes	0.045(0.207)	0.053(0.224)
Arthritis	0.234(0.423)	0.245(0.430)
Difficulty walking multiple blocks	0.068(0.251)	0.073(0.260)
Difficulty climbing stairs	0.032(0.177)	0.037(0.188)
Stroke	0.003(0.051)	0.003(0.050)
Heart Problems	0.070(0.255)	0.064(0.244)
Cancer	0.006(0.078)	0.007(0.080)
Smoke	0.173(0.378)	0.205(0.403)
Spouse health limitation	0.176(0.381)	0.184(0.387)
Spouse good-very good-excellent	0.920(0.272)	0.887(0.317)
Demographic factors		
Age	55.723(4.928)	55.915(5.327)
Male	0.498(0.500)	0.497(0.500)
Bachelor's degree	0.321(0.467)	0.257(0.437)
Professional degree	0.121(0.327)	0.089(0.284)
Mother reached retirement age	0.739(0.439)	0.706(0.455)
Father reached retirement age	0.586(0.493)	0.599(0.490)

Table 3. Tests of Rational Expectations- All Married Respondents.

Variables	Pooled OLS	IV	Corrected IV
Weak RE Test (H_0: exp t =1):	**Reject**	**Cannot Reject**	**Cannot Reject**
Constant	30.747(1.336)**	-5.801(2.551)**	-4.520(3.140)
Expected Retirement Age$_t$	0.5243(0.021)**	1.098(0.040)**	1.079(0.050)**
Inverse Mills' Ratio	-	-	-0.088(0.505)
Test of Over-Id Restrictions	-	Cannot Rej. P-v=.1333	Cannot Rej. P-v=.2109
Test of Weak Instruments	-	Reject P-v=.0000	Reject P-v=.0000
Strong RE Test (H_0: exp t =1):	**Reject**	**Cannot Reject**	**Cannot Reject**
Constant	29.747(2.517)**	2.184(4.350)	3.956(6.864)
Expected Retirement Age$_t$	0.454(0.039)**	1.041(0.085)**	1.059(0.083)**
Expected Ret. Age$_t$ of the Spouse	0.095(0.025)**	-0.057(0.036)	-0.0591(0.036)
Inverse Mills' Ratio	-	-	-1.681(3.152)
Economic factors at time t			
Net Worth (in $100,000)	0.045(0.038)	0.077(0.041)*	0.078(0.041)*
Respondent Income (in $1,000)	-0.002(0.002)	-0.002(0.001)	-0.002(0.002)
No Health Insurance	1.147(1.291)	0.466(1.456)	0.626(1.565)
Private Health Insurance	-0.027(0.335)	-0.624(0.411)	-0.603(0.418)
Self-employed	0.710(0.514)	-0.157(0.586)	-0.244(0.582)
Pension	-1.531(0.365)**	-0.747(0.411)*	-1.162(0.959)
Health factors at time t			
Health limitation	-0.408(0.327)	-0.396(0.358)	-0.361(0.354)
Good-V.Good-Exc. Health	-0.388(0.457)	-0.277(0.508)	-0.421(0.533)
Doctor visits	-0.004(0.024)	0.026(0.025)	0.027(0.025)
High blood pressure	0.261(0.341)	0.091(0.397)	0.022(0.410)
Diabetes	-0.755(0.583)	-1.219(0.753)	-1.245(0.752)*
Cancer	0.516(1.442)	0.639(1.252)	0.575(1.265)
Stroke	-0.350(1.288)	-0.690(0.956)	-0.128(0.911)
Heart Problems	0.500(0.602)	0.299(0.727)	0.184(0.725)
Arthritis	-0.187(0.313)	-0.498(0.365)	-0.562(0.381)
Difficulty walking multiple blocks	0.081(0.607)	0.431(0.685)	0.240(0.698)
Difficulty climbing stairs	1.406(0.724)*	0.296(0.782)	0.267(0.777)
Demographic factors at time t			
White	-0.099(0.352)	0.259(0.414)	0.102(0.442)
Male	1.518(0.291)**	0.056(0.357)	-0.134(0.491)
Bachelor's Degree	0.364(0.339)	-0.020(0.383)	-0.099(0.390)
Professional Degree	-0.505(0.409)	0.085(0.458)	-0.028(0.564)
Wave 1-2	-0.776(0.319)**	-0.199(0.373)	-0.106(0.397)
Wave 2-3	0.017(0.357)	0.131(0.426)	0.038(0.464)
Adjusted R^2	0.3119	-	-
Test of Joint Sig. of Covariates	Reject P-v=.0000	Cannot Rej. P-v=.683	Cannot Rej. P-v=.7083
Test of Over-Id Restrictions	-	Cannot Rej. P-v=.1796	Cannot Rej. P-v=.1217
Test of Weak Instruments	-	Reject P-v=.0000	Reject P-v=.0000
Number of Observations	1,524	1.462	1,456

Table 4. Tests of Rational Expectations- All Married Male Respondents.

Variables	Pooled OLS	IV	Corrected IV
Weak RE Test (H_0: exp t =1):	**Reject**	**Cannot Reject**	**Cannot Reject**
Constant	34.060(1.733)**	-3.855(3.458)	-4.152(3.816)
Expected Retirement Age$_t$	0.483(0.027)**	1.069(0.054)**	1.055(0.065)**
Inverse Mills' Ratio	-	-	1.106(0.885)
Test of Over-Id Restrictions	-	Cannot Rej. P-v=.1522	Cannot Rej. P-v=.2139
Test of Weak Instruments	-	Reject P-v=.0000	Reject P-v=.0000
Strong RE Test (H_0: exp t =1):	**Reject**	**Cannot Reject**	**Cannot Reject**
Constant	34.492(3.453)**	2.198(5.723)	3.15607 (6.47210)
Expected Retirement Age$_t$	0.436(0.052)**	1.047(0.101)**	1.1949 (0.1864)**
Expected Ret Age$_t$ Spouse	0.055(0.031)*	-0.080(0.044)*	-0.10994 (0.0585)*
Inverse Mills' Ratio	-	-	-6.0349 (5.9123)
Economic factors at time t			
Net Worth (in $100,000)	0.016(0.034)	0.038(0.037)	0.0625 (0.0452)
Respondent Income (in $1,000)	-0.010(0.005)**	-0.007(0.004)	-0.00961 (0.00531)*
No Health Insurance	2.823(1.679)*	2.292(1.835)	3.626743 (2.31)
Private Health Insurance	0.172(0.482)	-0.420(0.556)	-.3091457 (0.612388)
Self-employed	0.069(0.642)	-1.131(0.694)	-1.545455 (0.84009)*
Pension	-1.656(0.554)**	-1.345(0.604)**	-2.33641 (1.18342)**
Health factors at time t			
Health limitation	-1.050(0.473)**	-1.286(0.545)**	-1.4278 (0.591)**
Good-V.Good-Exc. Health	-0.052(0.638)	0.231(0.763)	-0.29736 (0.967)
Doctor visits	0.013(0.038)	0.079(0.037)**	0.0887 (0.0406)**
High blood pressure	0.875(0.498)*	0.767(0.579)	0.5317 (0.667)
Diabetes	-0.123(0.779)	-0.847(1.004)	-0.9077 (1.108)
Cancer	3.187(3.529)	2.148(2.975)	2.491 (2.9766)
Stroke	-0.527(1.236)	-0.754(1.029)	0.2231 (1.3015)
Heart Problems	-0.252(0.685)	-0.732(0.848)	-0.7073 (0.937)
Arthritis	0.298(0.490)	0.146(0.565)	-0.04741 (0.645)
Difficulty walk. multiple blocks	0.067(0.835)	0.709(0.971)	0.81248 (1.1067)
Difficulty climbing stairs	2.023(1.305)	2.910(1.466)**	3.2938 (1.587)**
Demographic factors at time t			
White	0.191(0.520)	1.197(0.613)*	0.55508 (0.961)
Bachelor's Degree	0.542(0.463)	-0.022(0.528)	-0.153 (0.596)
Professional Degree	0.095(0.515)	0.912(0.609)	0.4236 (0.799)
Wave 1-2	-0.7341(0.4375)	0.3705(0.5455)	1.1504(0.0507)
Wave 2-3	0.3019(0.4675)	0.3249(0.5386)	0.2545(0.5917)
Adjusted R^2	0.2760	-	-
Test of Joint Sig. of Covariates	Reject. P-v=.0074	Cannot Rej. P-v=.1626	Cannot Rej. P-v=.1854
Test of Over-Id Restrictions	-	Cannot Rej. P-v=.1472	Cannot Rej. P-v=.2941
Test of Weak Instruments	-	Reject P-v=.0000	Reject P-v=.0000
Number of Observations	782	748	744

Table 5. Tests of Rational Expectations- All Married Female Respondents.

Variables	Pooled OLS	IV	Corrected IV
Weak RE Test (H_0: exp t =1):	**Reject**	**Cannot Reject**	**Cannot Reject**
Constant	29.712(2.111)**	-5.538(4.382)	-0.200(3.600)
Expected Retirement Age$_t$	0.528(0.034)**	1.091(0.070)**	1.017(0.061)**
Inverse Mills' Ratio	-	-	-0.582(0.577)
Test of Over-Id Restrictions	-	Cannot Rej. P-v=.5074	Cannot Rej. P-v=.7699
Test of Weak Instruments	-	Reject P-v=.0000	Reject P-v=0.0000
Strong RE Test (H_0: exp t =1):	**Reject**	**Cannot Reject**	**Cannot Reject**
Constant	24.268(3.559)**	-0.874(6.062)	-4.075(13.974)
Expected Retirement Age$_t$	0.471(0.057)**	1.050(0.122)**	1.090(0.189)**
Expected Ret Age$_t$ Spouse	0.172(0.040)**	-0.003(0.051)	-0.010(0.059)
Inverse Mills' Ratio	-	-	0.691(3.513)
Economic factors at time t			
Net Worth (in $100,000)	0.094(0.069)	0.116(0.077)	0.091(0.084)
Respondent Income (in $1,000)	0.000(0.001)	0.000(0.001)	0.001(0.002)
No Health Insurance	0.111(1.908)	-0.836(2.111)	-1.012(2.212)
Private Health Insurance	-0.277(0.477)	-0.732(0.576)	-0.742(0.590)
Self-employed	2.243(0.982)**	1.231(1.185)	0.977(1.251)
Pension	-1.257(0.473)**	-0.080(0.561)	0.322(1.662)
Health factors at time t			
Health limitation	0.413(0.459)	0.695(0.440)	0.764(0.440)*
Good-V.Good-Exc. Health	-0.797(0.654)	-0.518(0.667)	-0.540(0.682)
Doctor visits	-0.034(0.031)	-0.024(0.029)	-0.024(0.031)
High blood pressure	-0.287(0.441)	-0.470(0.494)	-0.445(0.508)
Diabetes	-1.366(0.772)*	-1.434(0.963)	-1.548(1.036)
Cancer	-0.570(1.010)	0.971(0.912)	1.113(1.185)
Heart Problems	1.969(1.194)*	1.924(1.440)	1.828(1.449)
Arthritis	-0.740(0.403)*	-1.276(0.467)**	-1.293(0.478)**
Difficulty walk. multiple blocks	0.218(0.838)	0.210(0.893)	0.246(0.966)
Difficulty climbing stairs	1.228(0.865)	-0.603(0.922)	-0.840(1.007)
Demographic factors at time t			
White	-0.287(0.471)	-0.498(0.552)	-0.509(0.594)
Bachelor's Degree	0.451(0.499)	0.203(0.530)	0.236(0.541)
Professional Degree	-1.065(0.630)*	-0.587(0.643)	-0.416(0.881)
Wave 1-2	-0.893(0.465)*	-0.944(0.528)*	-0.858(0.536)
Wave 2-3	-0.333(0.545)	-0.339(0.648)	-0.307(0.798)
Adjusted R^2	0.3230	-	-
Test of Joint Sig. of Covariates	Reject P-v=.0254	Cannot Rej. P-v=.1625	Cannot Rej. P-v=.2149
Test of Over-Id Restrictions	-	Cannot Rej. P-v=.8733	Cannot Rej. P-v=.5723
Test of Weak Instruments	-	Reject P-v=.0000	Reject P-v=.0000
Number of Observations	742	714	712

Table 6. Tests of Joint Rational Retirement Expectations. The dependent variable is the difference, in years, to expected retirement.

Variables	Pooled OLS	IV	Corrected IV
Weak RE Test (H_0: exp t =1):	**Reject**	**Cannot Reject**	**Cannot Reject**
Constant	2.620 (0.388)**	0.460(1.238)	-0.056(0.577)
Diff. in Expected Years to $Ret._t$	0. 488 (0.077)**	0.989(0.289)**	1.046(0.151)**
Inverse Mills' Ratio	-	-	0.032(0.102)
Test of Over-Id Restrictions	Reject P-v=0.0000	Cannot Rej. P-v=.5512	Cannot Rej. P-v=.4583
Test of Weak Instruments	-	Reject P-v=.0018	Reject P-v=.0058
Strong RE Test (H_0: exp t =1):	**Reject**	**Cannot Reject**	**Cannot Reject**
Constant	4.579 (1.700)**	0.851(2.365)	0.601(3.171)
Diff. in Expected Years $Ret._t$	0.499 (0.068)**	1.048(0.281)**	1.055(0.359)**
Inverse Mills' Ratio	-	-	3.576(15.516)
Economic factors at time t			
Net Worth (in $100,000)	0.049 (0.096)	0.059(0.108)	0.073(0.113)
Respondent Income (in $1,000)	0.005 (0.013)	-0.001(0.010)	0.006(0.014)
Spouse's Income (in $1,000)	0.0001 (0.001)	-0.000(0.001)	-0.019(0.080)
No Health Insurance	5.631 (4.264)	6.373(4.162)	6.539(4.179)
Private Health Insurance	-0.492 (0.696)	-0.838(0.779)	-0.956(0.793)
Self-employed	1.333 (1.060)	1.423(1.154)	1.362(1.283)
Pension	-0.711 (0.773)	-0.560(0.834)	-0.863(1.019)
Pension - Spouse	-1.963 (0.692)**	-0.615(0.865)	-0.860(1.888)
Health factors at time t			
Health limitation	0.461 (0.755)	0.048(0.828)	0.094(1.789)
Health limitation - spouse	-1.234 (0.616)**	-0.885(0.646)	-0.792(0.958)
Good-V.Good-Exc. Hlt.	1.135 (0.911)	0.149(1.183)	0.245(1.207)
Good-V.Good-Exc. Hlt. Spouse	0.312 (1.211)	1.199(1.261)	0.893(1.880)
High blood pressure	-0.122 (0.705)	0.264(0.722)	0.336(1.049)
High blood pressure - Spouse	-0.852 (0.820)	-0.619(0.925)	-0.515(1.069)
Diabetes	1.108 (1.275)	1.512(1.438)	1.331(1.671)
Diabetes - Spouse	-1.131 (1.223)	-0.671(1.151)	-0.579(1.723)
Stroke	-1.825 (2.051)	-0.343(2.257)	-10.280(83.473)
Heart problems	-0.542 (0.992)	-0.221(0.981)	-0.264(1.017)
Heart problems - Spouse	0.819 (1.688)	0.417(1.733)	0.676(1.796)
Arthritis	0.195 (0.704)	0.017(0.686)	0.251(0.770)
Arthritis - Spouse	-1.032 (0.663)	-0.516(0.699)	-0.663(0.702)
Demographic factors at time t			
White	-1.399 (0.981)	-0.638(0.950)	-0.686(1.185)
Male	-0.388 (0.701)	-0.709(0.712)	-1.192(1.416)
Bachelor's Degree	-0.241 (0.740)	-0.487(0.709)	-0.519(0.831)
BA - spouse	0.128 (0.951)	0.460(0.905)	0.485(1.001)
Professional Degree	2.180 (1.085)**	2.282(0.983)**	2.405(1.356)*
Prof. Degree - Spouse	-1.926 (1.102)*	-1.679(0.956)*	-1.520(2.365)
Adjusted R^2	0.2731	-	-
Test of joint Sig. of Covariates	Cannot Rej. P-v=.11	Cannot Rej. P-v=.1686	Cannot Rej. P-v=.113
Test of Over-Id Restrictions	-	Cannot Rej. P-v=.9526	Cannot Rej. P-v=.863
Test of Weak Instruments	-	Reject P-v=.0016	Reject P-v=.0011
Number of Observations	N=432	N=419	N=415

Table A.1. Selection Equation – Probability of Thinking about Retirement. Table 3.

Variables	Probit	Marg. Effects
Economic Factors		
Net wealth (in $100,000)	-0.001(0.002)	-0.0004
Income (in $1,000)	0.001(0.000)**	0.0004
No Health Insurance	-0.215(0.057)**	-0.065
Private Health Insurance	-0.026(0.034)	-0.008
Self-Employed	0.005(0.044)	0.002
Pension	0.356(0.034)**	0.112
Financially Knowledgeable	0.021(0.032)	0.007
Health Factors		
Health limitation	0.008(0.036)	0.003
Good-V.Good-Exc. Health	0.074(0.042)*	0.023
Doctor visits	-0.002(0.002)	-0.001
Probability of living to 85	-0.105(0.046)**	-0.034
Diff. walking multiple blocks	0.041(0.055)	0.013
Diff. climbing stairs	-0.007(0.072)	-0.002
High blood pressure	0.032(0.035)	0.010
Diabetes	-0.067(0.063)	-0.021
Cancer	0.032(0.144)	0.010
Stroke	-0.030(0.284)	-0.010
Heart problems	0.016(0.054)	0.005
Arthritis	0.048(0.0312)	0.016
Smoke	-0.109(0.037)**	-0.034
Demographic Factors		
Age	0.003(0.003)	0.001
Male	0.131(0.035)**	0.042
White	0.011(0.040)	0.004
Bachelor's degree	0.022(0.042)	0.007
Professional degree	0.154(0.059)**	0.052
Mother reached retirement age	0.094(0.034)**	0.030
Father reached retirement age	0.019(0.031)	0.006
Wave 2	-0.050(0.032)	-0.016
Wave 3	0.084(0.030)**	0.027
Constant	-1.208(0.195)**	-
Predicted Probability	0.2578	
Log Likelihood	-7886.14	
Pseudo-R^2	0.0329	
Number of Observations	14,092	

Table A.2.1. First Stage Results for Weak RE Test using IV. Married Respondents in Table 3

Variables	1st Stage of IV	1st Stage of Corrected IV
Constant	36.258(1.173)**	88.426(4.090)**
Prob. Of Living to 85	0.753(0.294)**	2.319(0.358)**
Smoking	0.968(0.228)**	1.865(0.334)**
Age	0.524(0.022)**	-
Age - spouse	-0.050(0.017)**	-
Inverse Mills' Ratio	-	-17.203(2.659)**
Economic factors at time t		
Net Worth (in $100,000)	-	0.004(0.016)
Respondent Income (in $1,000)	-	-0.013(0.002)**
No Health Insurance	-	4.835(0.648)**
Private Health Insurance	-	0.805(0.251)**
Self-employed	-	0.863(0.311)**
Pension	-	-6.116(0.761)**
Financially Knowledgeable	-	0.102(0.201)
Health factors at time t		
Health limitation	-	-0.138(0.263)
Good-V.Good-Exc. Health	-	-0.972(0.357)**
Doctor visits	-	0.004(0.016)
High blood pressure	-	0.192(0.252)
Diabetes	-	1.226(0.469)**
Cancer	-	0-.728(1.133)
Stroke	-	-2.426(2.112)
Heart Problems	-	-0.302(0.383)
Arthritis	-	-0.245(0.249)
Difficulty walk. multiple blocks	-	-0.063(0.424)
Difficulty climbing stairs	-	0.827(0.558)
Demographic factors at time t		
White	-	0.297(0.258)
Male	-	-0.017(0.351)
Bachelor's Degree	-	-0.363(0.251)
Professional Degree	-	-2.202(0.439)
Wave 1-2	-	-0.055(0.250)
Wave 2-3	-	-1.481(0.294)**
Adj. R^2	0.148	0.085
Test of Weak Instruments	F(4,3875)=169.46	F(26,3712)=13.59
Number of Observations	3,880	3,740

Table A.2.2. First Stage Results for Strong RE Test using IV. Married Respondents in Table 3

Variables	1st Stage of IV	1st Stage of Corrected IV
Constant	27.308(2.280)**	24.981(7.085)**
Expected Ret. age of spouse$_t$	0.208(0.023)**	0.208(0.024)**
Prob. Of Living to 85	-0.050(0.464)	-0.148(0.532)
Smoking	0.771(0.365)**	0.653(0.500)
Age	0.4660(0.0384)**	0.471(0.040)**
Age-spouse	-0.0711(0.035)**	-0.072(0.035)**
Inverse Mills' Ratio	-	1.359(3.971)
Economic factors at time t		
Net Worth (in $100,000)	-0.067(0.029)**	-0.067(0.029)**
Respondent Income (in $1,000)	-0.000(0.002)	0.000(0.003)
No Health Insurance	1.143(0.891)	0.913(1.105)
Private Health Insurance	0.714(0.343)**	0.697(0.352)**
Self-employed	1.621(0.460)**	1.620(0.462)**
Pension	-0.912(0.343)**	-0.544(1.157)
Health factors at time t		
Health limitation	0.327(0.380)	0.355(0.384)
Good-V.Good-Exc. Health	0.617(0.494)	0.692(0.532)
Doctor visits	-0.032(0.022)	-0.034(0.022)
High blood pressure	0.061(0.354)	0.096(0.364)
Diabetes	0.659(0.700)	0.583(0.730)
Cancer	-1.253(1.696)	-1.249(1.700)
Stroke	-0.181(2.522)	-0.360(2.923)
Heart Problems	-0.091(0.545)	-0.052(0.551)
Arthritis	0.071(0.337)	0.104(0.366)
Difficulty walk. Mult. blocks	-0.559(0.606)	-0.531(0.617)
Difficulty climbing stairs	1.239(0.817)	1.226(0.819)
Demographic factors at time t		
White	-0.363(0.370)	-0.327(0.382)
Male	0.884(0.323)**	1.034(0.536)*
Bachelor's Degree	0.409(0.343)	0.433(0.356)
Professional Degree	-1.070(0.460)	-0.915(0.643)
Wave 1-2	-0.039(0.344)	-0.084(0.371)
Wave 2-3	0.006(0.355)	0.085(0.437)
Adj. R^2	0.2291	0.2290
Test of Weak Instruments	F(4,1433)=44.22	F(4,1426)=42.86
Number of Observations	1,462	1,456

Table A.3. Tests of Rational Retirement Expectations. Married Respondents. Sensitivity Analysis

Variables	Pooled OLS	IV	Corrected IV
Weak RE Test (H_0: exp t =1):	**Reject**	**Cannot Reject**	**Cannot Reject**
Constant	30.747(1.336)**	-5.801(2.551)**	-4.520(3.140)
Expected Retirement Age$_t$	0.524(0.021)**	1.098(0.040)**	1.079(0.050)**
Inverse Mills' Ratio	-	-	-0.088(0.505)
Test of Over-Id Restrictions	-	Cannot Rej. P-v=.1333	Cannot Rej. P-v=.2109
Test of Weak Instruments	-	Reject P-v=.0000	Reject P-v=.0000
Strong RE Test (H_0: exp t =1):	**Reject**	**Cannot Reject**	**Cannot Reject**
Constant	34.503(1.616)**	-5.954(3.409)*	-3.535(4.673)
Expected Retirement Age$_t$	0.463(0.024)**	1.100(0.054)**	1.104(0.054)**
Inverse Mills' Ratio	-	-	-1.639(1.917)
Economic factors at time t			
Net Worth (in $100,000)	0.024(0.018)	0.033(0.023)	0.034(0.023)
Respondent Income (in $1,000)	-0.003(0.002)	-0.001(0.002)	-0.002(0.002)
Spouse's Income (in $1,000)	0.001(0.002)	0.001(0.002)	0.001(0.002)
No Health Insurance	0.753(0.576)	-0.290(0.721)	-0.158(0.805)
Private Health Insurance	0.299(0.241)	-0.081(0.282)	-0.099(0.285)
Self-employed	0.806(0.336)**	-0.037(0.369)	-0.223(0.370)
Pension	-1.215(0.235)**	-0.405(0.273)	-0.918(0.596)
Pension – spouse	-0.379(0.182)**	0.039(0.203)	0.082(0.203)
Health factors at time t			
Health limitation - own	-0.022(0.250)	-0.052(0.295)	-0.087(0.294)
Health limitation - spouse	-0.022(0.246)	0.093(0.292)	0.071(0.292)
Good-V.Good-Exc. Hlt. Resp.	-0.259(0.305)	-0.074(0.348)	-0.255(0.375)
Good-V.Good-Exc. Hlt. Spouse	0.182(0.297)	0.203(0.369)	0.125(0.371)
High blood pressure	0.116(0.236)	-0.077(0.287)	-0.156(0.292)
High blood pressure - spouse	0.313(0.231)	-0.056(0.281)	0.096(0.279)
Diabetes	-0.405(0.347)	-0.343(0.437)	-0.281(0.449)
Diabetes - spouse	0.530(0.498)	0.167(0.599)	0.267(0.600)
Stroke	-1.287(0.987)	0.389(0.715)	0.930(0.658)
Stroke - spouse	-1.257(1.580)	-3.038(2.091)	-3.611(2.080)*
Heart problems	0.321(0.386)	0.138(0.488)	-0.015(0.491)
Heart problems - spouse	-0.220(0.313)	-0.287(0.353)	-0.353(0.353)
Arthritis	0.179(0.221)	-0.009(0.261)	-0.140(0.275)
Arthritis - spouse	0.132(0.219)	0.025(0.268)	-0.020(0.270)
Cancer	-1.031(0.789)	-0.825(0.952)	-0.767(0.996)
Doctor visit	0.008(0.014)	0.020(0.016)	0.024(0.016)
Diff. walking multiple blocks	-0.273(0.419)	-0.178(0.520)	-0.288(0.531)
Diff. walking mult. blocks-sp.	-0.139(0.318)	-0.369(0.409)	-0.348(0.411)
Diff. climbing stairs	0.632(0.543)	0.519(0.692)	0.402(0.697)
Diff. climbing stairs - spouse	0.426(0.426)	0.326(0.546)	0.253(0.552)
Demographic factors at time t			
White	0.300(0.232)	0.074(0.268)	0.075(0.272)
Male	1.392(0.194)**	0.167(0.220)	0.034(0.290)
Bachelor's Degree	0.431(0.249)*	0.204(0.255)	0.173(0.254)
BA - spouse	0.173(0.272)	-0.082(0.288)	-0.032(0.286)
Professional Degree	-0.720(0.298)**	-0.280(0.311)	-0.435(0.385)
Prof. Degree – spouse	0.101(0.370)	0.572(0.371)	0.558(0.370)
Wave 2	-0.759(0.209)**	-0.189(0.250)	-0.092(0.259)
Wave 3	-0.032(0.241)	0.210(0.298)	0.159(0.330)

Adjusted R^2	0.2943	-	-
Test of joint Sig. of Covariates	Reject P-v=.0000	Cannot Rej. P-v=.9297	Cannot Rej. P-v=.771
Test of joint Sig. of Cov. Spouse	Cannot Rej. P-v=.6514	Cannot Rej. P-v=.8357	Cannot Rej. P-v=.7281
Test of Over-Id Restrictions	-	Reject P-v=.0076	Reject P-v=.0018
Test of Weak Instruments	-	Reject P-v=.0637	Reject P-v=.0000
Number of Observations	3,526	3,346	3,313

Table A.4. Selection Equation–Probability of Thinking about Ret. Married Males in Table 4

Variables	Probit	Marg. Effects
Economic Factors		
Net wealth (in $100,000)	-0.002(0.003)	-0.007
Income (in $1,000)	0.001(0.000)*	0.000
No Health Insurance	-0.275(0.077)**	-0.088
Private Health Insurance	-0.060(0.046)	-0.020
Self-Employed	0.039(0.056)	0.013
Pension	0.212(0.046)**	0.072
Financially Knowledgeable	0.049(0.046)	0.017
Health Factors		
Health limitation	-0.001(0.050)	-0.000
Good-V.Good-Exc. Health	0.097(0.055)*	0.033
Doctor visits	0.000(0.003)	0.000
Probability of living to 85	-0.041(0.064)	-0.014
Diff. walking multiple blocks	0.020(0.085)	0.007
Diff. climbing stairs	-0.024(0.118)	-0.008
High blood pressure	0.036(0.046)	0.012
Diabetes	-0.025(0.079)	-0.009
Cancer	-0.068(0.223)	-0.023
Stroke	-0.173(0.315)	-0.056
Heart problems	-0.002(0.067)	-0.001
Arthritis	0.050(0.045)	0.017
Smoke	-0.089(0.050)*	-0.030
Demographic Factors		
Age	-0.016(0.005)**	-0.006
White	0.138(0.055)**	0.046
Bachelor's degree	0.003(0.056)	0.001
Professional degree	0.137(0.075)*	0.048
Mother reached retirement age	0.099(0.049)**	0.034
Father reached retirement age	-0.049(0.043)	-0.017
Wave 2	-0.177(0.045)**	-0.060
Wave 3	0.013(0.041)	0.004
Constant	0.051(0.307)	-
Predicted Probability	0.2912	
Log Likelihood	-4228.8058	
Pseudo-R^2	0.0244	
Number of Observations	7,132	

Table A.4.1. First Stage Results for Weak RE Test using IV. Married Males in Table 4

Variables	1st Stage of IV	1st Stage of Corrected IV
Constant	34.394(1.6789)**	26.532(3.053)**
Prob. Of Living to 85	1.4754(0.3228)**	1.006(0.412)**
Smoking	0.8097(0.2910)**	-1.045(0.329)**
Age	0.5148(0.0329)**	-
Age of the spouse	-0.006 (0.023)	-
Inverse Mills' Ratio	-	26.522(2.093)**
Economic factors at time t		
Net Worth (in $100,000)	-	-0.068(0.023)**
Respondent Income (in $1,000)	-	0.014(0.003)**
No Health Insurance	-	-4.252(0.738)**
Private Health Insurance	-	-0.668(0.330)**
Self-employed	-	2.085(0.375)**
Pension	-	3.664(0.479)**
Financially Knowledgeable	-	1.108(0.284)**
Health factors at time t		
Health limitation	-	0.002(0.337)
Good-V.Good-Exc. Health	-	1.685(0.448)**
Doctor visits	-	-0.020(0.022)
High blood pressure	-	1.000(0.307)**
Diabetes	-	0.030(0.530)
Cancer	-	-1.405(1.717)
Stroke	-	-5.014(2.703)*
Heart Problems	-	0.030(0.441)
Arthritis	-	1.068(0.308)**
Difficulty walk. multiple blocks	-	0.528(0.597)
Difficulty climbing stairs		
	-	-1.298(0.873)
Demographic factors at time t		
White		
Bachelor's Degree	-	2.835(0.404)**
Professional Degree	-	0.129(0.313)
Wave 1-2	-	2.735(0.452)**
Wave 2-3	-	-3.464(0.350)**
	-	0.091(0.319)
Adj. R^2	0.1370	0.1084
Test of Weak Instruments	F(4,2192)=87	F(25,2087)=8.02
Number of Observations	2,197	2,114

Table A.4.2. First Stage Results for Strong RE Test using IV. Married Males in Table 4

Variables	1st Stage of IV	1st Stage of Corrected IV
Constant	24.202(3.351)**	22.015(4.839)**
Expected Ret. age of spouse$_t$	0.2191(0.0292)**	0.221(0.029)**
Prob. of living to 85	0.2551(0.621)	0.159(0.635)
Smoking	0.9579(0.496)*	0.726(0.617)
Age	0.5384(0.0561)**	0.505(0.081)**
Age of the spouse	-0.0879(0.041)**	-0.089(0.042)**
Inverse Mills' Ratio	-	2.946(4.861)
Economic factors at time t		
Net Worth (in $100,000)	-0.0855(0.037)**	-0.091(0.039)**
Respondent Income (in $1,000)	-0.0033(0.0045)	-0.002(0.005)
No Health Insurance	0.3231(1.2082)	-0.277(1.553)
Private Health Insurance	0.9215(0.4579)**	0.828(0.499)*
Self-employed	1.6876(0.5646)**	1.753(0.586)**
Pension	0.022(0.4831)	0.489(0.939)
Health factors at time t		
Health limitation	0.7822(0.5041)	0.794(0.509)
Good-V.Good-Exc. Health	0.5022(0.6350)	0.732(0.733)
Doctor visits	-0.0756(0.03)**	-0.076(0.031)**
High blood pressure	0.1227(0.4571)	0.196(0.472)
Diabetes	1.1961(0.9070)	1.153(0.911)
Cancer	0.8753(2.772)	0.650(2.806)
Stroke	-1.1534(2.429)	-0.595(2.868)
Heart Problems	-0.0228(0.6498)	0.049(0.659)
Arthritis	-0.091(0.4719)	0.010(0.514)
Difficulty walk. Mult. blocks	-0.9869(0.9228)	-0.960(0.929)
Difficulty climbing stairs	-1.7465(1.364)	-1.850(1.376)
Demographic factors at time t		
White	-0.9691(0.5095)*	-0.633(0.749)
Bachelor's Degree	0.7438(0.4572)	0.726(0.459)
Professional Degree	-1.1987(0.586)**	-0.887(0.782)
Wave 1-2	-0.1541(0.462)	-0.531(0.781)
Wave 2-3	0.337(0.4729)	0.360(0.480)
Adj. R^2	0.2226	0.2225
Test of Weak Instruments	F(4,720)=25.05	F(4,715)=10.72
Number of Observations	748	744

Table A.5. Selection Equation–Probability of Thinking about Ret. Married Females in Table 5

Variables	Probit	Marg. Effects
Economic Factors		
Net wealth (in $100,000)	0.000(0.004)	.0001
Income (in $1,000)	0.002(0.001)	.0006
No Health Insurance	-0.155(0.084)*	-.0438
Private Health Insurance	0.005(0.050)	.0016
Self-Employed	-0.071(0.076)	-.0206
Pension	0.490(0.050)*	.1415
Financially Knowledgeable	-0.011(0.045)	-.0032
Health Factors		
Health limitation	0.027(0.053)	.0082
Good-V.Good-Exc. Health	0.030(0.064)	.0089
Doctor visits	-0.003(0.003)	-.0009
Probability of living to 85	-0.148(0.068)*	-.0441
Diff. walking multiple blocks	0.073(0.075)	.0223
Diff. climbing stairs	-0.005(0.093)	-.0016
High blood pressure	0.020(0.053)	.0059
Diabetes	-0.148(0.104)	-.0416
Cancer	0.115(0.190)	.0357
Heart problems	0.062(0.093)	.0188
Arthritis	0.037(0.045)	.0110
Smoke	-0.125(0.055)**	-.0361
Demographic Factors		
Age	0.018(0.005)**	.0053
White	-0.103(0.058)*	-.0315
Bachelor's degree	0.033(0.063)	.0098
Professional degree	0.206(0.096)**	.0652
Mother reached retirement age	0.063(0.049)	.0186
Father reached retirement age	0.090(0.045)**	.0266
Wave 2	0.069(0.046)	.0206
Wave 3	0.146(0.043)**	.0446
Constant	-2.057(0.277)**	-
Predicted Probability	0.2217	
Log Likelihood	-3599.3451	
Pseudo-R^2	0.0487	
Number of Observations	6,960	

Table A.5.1. First Stage Results for Weak RE Test using IV. Married Female in Table 5

Variables	1st Stage of IV	1st Stage of Corrected IV
Constant	39.432(1.688)**	92.379(2.747)**
Prob. Of Living to 85	-0.042(0.459)	2.029(0.497)**
Smoking	1.185(0.363)**	2.704(0.419)**
Age	0.447(0.038)**	-
Age of the spouse	-0.031(0.033)	-
Inverse Mills' Ratio	-	-20.053(1.748)**
Economic factors at time t		
Net Worth (in $100,000)	-	-0.018(0.022)
Respondent Income (in $1,000)	-	-0.012(0.003)**
No Health Insurance	-	5.124(0.722)**
Private Health Insurance	-	0.268(0.365)
Self-employed	-	2.120(0.559)**
Pension	-	-9.551(0.742)
Financially Knowledgeable	-	0.612(0.277)
Health factors at time t		
Health limitation	-	-0.185(0.393)
Good-V.Good-Exc. Health	-	0.158(0.491)
Doctor visits	-	0.037(0.021)*
High blood pressure	-	0.057(0.382)
Diabetes	-	2.176(0.800)**
Cancer	-	-3.640(1.456)**
Heart Problems	-	-1.105(0.684)
Arthritis	-	-0.325(0.334)
Difficulty walk. multiple blocks	-	-0.527(0.557)
Difficulty climbing stairs	-	1.462(0.697)**
Demographic factors at time t		
White	-	1.938(0.356)**
Bachelor's Degree	-	-0.979(0.377)**
Professional Degree	-	-3.714(0.582)**
Wave 1-2	-	-0.808(0.332)
Wave 2-3	-	-2.120(0.399)**
Adj. R^2	0.1145	0.1319
Test of Weak Instruments	F(4,1678)=55.38	F(24,1600)=10.2
Number of Observations	1,683	1,626

Table A.5.2. First Stage Results for Strong RE Test using IV. Married Females in Table 5

Variables	1st Stage of IV	1st Stage of Corrected IV
Constant	28.430(3.507)**	36.245(11.153)**
Expected Ret. age of spouse$_t$	0.193(0.038)**	0.192(0.039)**
Prob. of living to 85	-0.522(0.705)	-0.206(0.828)
Smoking	0.665(0.543)	1.036(0.734)
Age	0.392(0.060)**	0.340(0.093)**
Age of the spouse	-0.004(0.071)	0.001(0.071)
Inverse Mills' Ratio	-	-3.403(4.602)
Economic factors at time t		
Net Worth (in $100,000)	-0.039(0.046)	-0.044(0.047)
Respondent Income (in $1,000)	0.000(0.003)	-0.001(0.003)
No Health Insurance	2.361(1.322)*	2.738(1.420)*
Private Health Insurance	0.499(0.520)	0.492(0.521)
Self-employed	2.153(0.841)**	2.339(0.879)**
Pension	-1.751(0.498)**	-3.076(1.861)*
Health factors at time t		
Health limitation	0.039(0.581)	-0.019(0.588)
Good-V.Good-Exc. Health	0.719(0.782)	0.670(0.786)
Doctor visits	-0.006(0.031)	-0.000(0.033)
High blood pressure	-0.042(0.560)	-0.069(0.563)
Diabetes	0.017(1.094)	0.437(1.235)
Cancer	-3.047(2.209)	-3.332(2.246)
Heart Problems	0.082(0.984)	-0.063(1.005)
Arthritis	0.289(0.491)	0.202(0.505)
Difficulty walk. multiple blocks	-0.190(0.821)	-0.323(0.843)
Difficulty climbing stairs	2.622(1.054)**	2.641(1.056)**
Demographic factors at time t		
White	0.110(0.545)	0.322(0.616)
Bachelor's Degree	0.110(0.524)	-0.021(0.554)
Professional Degree	-0.758(0.737)	-1.286(1.028)
Wave 1-2	0.447(0.581)	0.291(0.621)
Wave 2-3	-0.029(0.545)	-0.384(0.725)
Adj. R^2	0.1858	0.1852
Test of Weak Instruments	$F(4,687)=19.98$	$F(4,684)=9.46$
Number of Observations	714	712

Table A.6. Selection Equation- Probability of Thinking about Retirement. Table 6

Variables	Probit	Marg. Effects
Economic Factors		
Net wealth (in $100,000)	0.008(0.005)	0.002(0.001)
Income (in $1,000) -Resp.	0.0003(0.0004)	0.000(0.000)
Income (in $1,000) -Spouse	-0.006(0.001)**	-0.001(0.000)**
No Health Insurance	0.329(0.102)**	0.066(0.018)**
Private Health Insurance	-0.029(0.052)	-0.007(0.012)
Self-Employed	-0.035(0.063)	-0.008(0.015)
Pension-Respondent	-0.129(0.051)**	-0.030(0.012)**
Pension-Spouse	-0.260(0.046)**	-0.060(0.011)**
Health Factors		
Health limitation-Resp.	-0.084(0.054)	-0.020(0.013)
Health limitation-Spouse	0.102(0.056)*	0.023(0.012)*
Good-V.gd.-Exc. Hlth-Resp.	-0.056(0.069)	-0.013(0.015)
Good-V.gd.-Exc. Hlt.-Spouse	-0.271(0.073)**	-0.057(0.014)**
Doctor visits-Respondent	0.001(0.003)	0.000(0.001)
Doctor visits-Spouse	0.010(0.003)**	0.002(0.001)**
Probability of living to 85	0.112(0.072)	0.026(0.017)
High blood press.-Resp.	0.049(0.052)	0.011(0.012)
High blood press.-Spouse	0.105(0.055)*	0.024(0.012)*
Diabetes-Respondent	-0.110(0.095)	-0.027(0.024)
Diabetes-Spouse	0.267(0.103)**	0.055(0.018)
Stroke-Respondent	0.499(0.301)*	0.088(0.037)*
Stroke-Spouse	0.100(0.348)	0.022(0.073)
Heart problems-Respondent	-0.055(0.081)	-0.013(0.020)
Heart problems-Spouse	-0.057(0.088)	-0.014(0.021)
Arthritis-Respondent	0.066(0.0450)	0.015(0.011)
Arthritis-Spouse	-0.034(0.047)	-0.008(0.011)
Demographic Factors		
Age-Respondent	0.009(0.006)	0.002(0.001)*
Age-Spouse	0.001(0.004)	0.000(0.001)
Male	-0.208(0.060)**	-0.047(0.013)**
White	-0.028(0.059)	-0.006(0.014)
Bachelor's degree-Resp.	-0.013(0.060)	-0.003(0.014)
Bachelor's degree-Spouse	0.023(0.067)	0.005(0.015)
Professional degree-Resp.	0.029(0.082)	0.007(0.019)
Professional degree-Spouse	-0.145(0.092)	-0.036(0.024)
Mother reached retirement age	-0.109(0.051)**	-0.025(0.011)**
Father reached retirement age	0.041(0.045)	0.010(0.011)
Constant	1.044(0.297)**	-
Predicted Probability	0.84997	
Log Likelihood	-2815.25	
Pseudo-R^2	0.0568	
Number of Observations	6,653	

Table A.6.1. First Stage Results for Weak RE Test using IV in Table 6

Variables	1st Stage of IV	1st Stage of Corrected IV
Constant	15.797(3.469)**	19.017(4.111)**
Age-Respondent	-0.079(0.065)	-0.068(0.079)
Age-Spouse	-0.132(0.052)**	-0.175(0.060)**
Prob. Of Living to 85	-0.046(0.832)	-0.375(0.926)
Smoking	1.183(0.743)	0.648(0.746)
Inverse Mills' Ratio	-	-6.2896(4.629)
Economic factors at time t		
Net Worth (in $100,000)	-	0.044(0.062)
Income (in $1,000)-Respondent	-	-0.001(0.010)
Income (in $1,000)-Spouse	-	0.033(0.024)
No Health Insurance	-	-0.966(2.056)
Private Health Insurance	-	1.120(0.666)*
Self-employed	-	-0.477(0.881)
Pension--Respondent	-	0.149(0.753)
Pension--spouse	-	-1.845(0.712)**
Health factors at time t		
Health limitation-Respondent	-	0.923(0.718)
Health limitation-Spouse	-	-0.830(0.767)
Good-V.Good-Exc. Hlt.-Resp.	-	1.660(1.038)
Good-V.Good-Exc. Hlt.-Spouse	-	-0.234(1.227)
High blood press.-Resp.	-	-0.603(0.657)
High blood pressure-Spouse	-	-0.483(0.721)
Diabetes -Respondent	-	-0.255(1.176)
Diabetes-Spouse	-	-0.701(1.724)
Stroke--Respondent	-	-4.365(5.231)
Heart Problems-Respondent	-	-0.254(1.020)
Heart Problems-Spouse	-	0.761(1.125)
Arthritis-Respondent	-	-0.071(0.650)
Arthritis-Spouse	-	-0.121(0.654)
Demographic factors at time t		
White	-	-0.638(0.786)
Male	-	0.877(0.860)
Bachelor's Degree-Respondent	-	0.196(0.635)
Bachelor's Degree-Spouse	-	-0.230(0.705)
Professional Degree-Respondent	-	0.277(0.887)
Professional Degree-Spouse	-	-0.698(1.007)
Adj. R^2	0.030	0.052
Test of Weak Instruments	F(4,428)=4.38	F(30,383) =1.83
Number of Observations	433	415

Table A.6.2. First Stage Results for Strong RE Test using IV in Table 6

Variables	1st Stage of IV	1st Stage of Corrected IV
Constant	17.844(3.992)**	19.017(4.111)**
Age-Respondent	-0.044(0.076)	-0.068(0.079)
Age-Spouse	-0.180(0.060)**	-0.175(0.060)**
Prob. Of Living to 85	-0.061(0.892)	-0.375(0.926)
Smoking	0.653(0.742)	0.648(0.746)
Inverse Mills' Ratio	-	-6.2896(4.629)
Economic factors at time t		
Net Worth (in $100,000)	0.066(0.060)	0.044(0.062)
Income (in $1,000)-Resp.	0.002(0.009)	-0.001(0.010)
Income (in $1,000)-Spouse	0.000(0.002)	0.033(0.024)
No Health Insurance	-0.552(2.024)	-0.966(2.056)
Private Health Insurance	0.968(0.653)	1.120(0.666)*
Self-employed	-0.526(0.877)	-0.477(0.881)
Pension-Respondent	-0.189(0.708)	0.149(0.753)
Pension-Spouse	-2.371(0.587)	-1.845(0.712)**
Health factors at time t		
Health limitation-Respondent	0.733(0.696)	0.923(0.718)
Health limitation-Spouse	-0.557(0.726)	-0.830(0.767)
Good-V.Good-Exc. Hlt.-Resp.	1.561(1.014)	1.660(1.038)
Good-V.Good-Exc. Htl.-Sp.	-0.696(1.139)	-0.234(1.227)
High blood pres.-Resp.	-0.454(0.640)	-0.603(0.657)
High blood pressure-Sp.	-0.262(0.700)	-0.483(0.721)
Diabetes-Respondent	-0.598(1.135)	-0.255(1.176)
Diabetes-Spouse	-0.251(1.684)	-0.701(1.724)
Stroke-Respondent	-3.229(3.630)	-4.365(5.231)
Heart Problems-Respondent	-0.283(1.010)	-0.254(1.020)
Heart Problems-Spouse	0.728(1.088)	0.761(1.125)
Arthritis-Respondent	0.075(0.637)	-0.071(0.650)
Arthritis-Spouse	-0.241(0.645)	-0.121(0.654)
Demographic factors at time t		
White	-0.773(0.769)	-0.638(0.786)
Male	0.119(0.663)	0.877(0.860)
Bachelor's Degree-Resp.	0.208(0.630)	0.196(0.635)
Bachelor's Degree-Spouse	-0.122(0.697)	-0.230(0.705)
Professional Degree-Resp.	0.267(0.880)	0.277(0.887)
Professional Degree-Spouse	-0.802(0.992)	-0.698(1.007)
Adj. R^2	0.054	0.052
Test of Weak Instruments	F(4, 387) =4.44	F(4,382) =4.64
Number of Observations	419	415