The Effect of Subjective Survival Probabilities on Retirement and Wealth[1]

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September 2006

[1] Paper presented at Workshop on Comparative International Research Based on HRS, ELSA and SHARE, hosted by RAND, July 10-11, 2006, Santa Monica.
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Abstract

We explore the proposition that expected longevity affects retirement decisions and wealth using micro data drawn from the Health and Retirement Survey for the United States, the English Longitudinal Study of Ageing, and the Survey of Health, Ageing and Retirement in Europe. We use data on a person's subjective probability of survival to age 75 as a proxy for their prospective lifespan. In order to control for the presence of measurement error and focal points in responses, as well as reverse causality, we instrument subjective survival probabilities using information on current age, or age at death, of the respondent's parents. Our estimates for the US and UK indicate that increased subjective probabilities of survival result in increased household wealth among couples, with no effect on the length of the working life. These findings are consistent with the view that retirement decisions are driven by institutional constraints and incentives and that a longer expected lifespan leads to increased wealth. The SHARE results are less informative, mainly due to small sample sizes.

1. Introduction

The life cycle model of savings is among the best established constructs in the field of economics. According to this model, people save during the prime working years to finance their consumption during retirement. Although the main predictions of this theory are well-supported empirically, pure life cycle models are not naturally suited to explaining sharp increases in savings rates at all ages, such as those observed in East Asia between 1950 and 1990 (see Deaton (1992) for Thailand and Deaton and Paxson (1994, 1997, 2000) for the case of Taiwan).[6]

Lee, Mason, and Miller (1998, 2000) hypothesize, however, that the need to finance a longer period of retirement can account for an upward shift in the age-savings profile, and they simulate for Taiwan a life-cycle model with a fixed retirement age to demonstrate that rapidly improving life expectancy can account for a rise in savings at all ages and a concomitant surge in the rate of national savings. Tsai, Chu, and Chung (2000) show that the timing of the rise in household savings in Taiwan matches the increases in life expectancy of the population.

Bloom, Canning, and Graham (2003) construct a model of aggregate saving that includes life expectancy as an argument and estimate the parameters of the model using cross-country panel data. They find that increases in life expectancy play a large role in savings behavior, and can account for the observed savings boom in East Asia. Although such an effect is plausible given strong disincentives for delayed age at retirement, Deaton and Paxson (2000) argue that in a flexible economy, without mandatory retirement, the main effect of a rise in longevity will be on the span of the working life, not on the rate of saving. Bloom, Canning, and Moore (2004) formalize this argument to show that under reasonable assumptions the optimal response to an improvement in health and a rise in life expectancy is to increase the length of working life,

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[6] For example, the private savings rate in Taiwan rose from around 5% in the 1950's to well over 20% in the 1980's and 1990's.

though less than proportionately, with no need to raise saving rates at all (due to the gains from enjoying compound interest over a longer life span). This result implies that the positive effect of longevity on savings found in cross-country studies is driven by institutional features of retirement systems, such as mandatory retirement, which prevent workers from lengthening their working lives.[7] Bloom, Canning, Mansfield, and Moore (2006) examine this issue by constructing a model in which retirement and savings decisions are jointly determined and in which variations in health status, expected longevity, and features of the social security system are allowed to influence retirement and savings behavior. Their empirical results indicate that longer life expectancy increases savings in countries with mandatory retirement, but has little effect on savings in countries whose retirement systems are close to age-neutral.

The objective of this paper is to examine these ideas further using micro data drawn from the Health and Retirement Study (HRS) for the U.S and the Survey of Health, Ageing and Retirement in Europe (SHARE). The HRS provides data on labor supply, household wealth, and a rich set of controls for a large representative sample of individuals aged 51-61 in 1992 that were followed through 2004. One remarkable feature of the HRS that makes it ideally suited to this study is the inclusion of information on respondents' subjective probabilities of survival. We analyze the validity of this variable and use information on the current age or the age at death of each respondent's parents as instruments to correct for the presence of classical measurement error and focal points in responses. We repeat the same analysis using the SHARE data, which cover 10 European countries.

Section 2 describes the nature and configuration of the HRS data and summarizes previous studies of the information content of key HRS variables. Section 3 motivates our

[7] According to Gruber and Wise (1998) and Blondal and Scarpetta (1997), social security systems in many countries offer individuals strong financial incentives to retire at particular ages; they also provide evidence that workers respond to these incentives by retiring earlier than they would in their absence.

instrumental variables estimators by focusing on the validity of the subjective survival probabilities. Section 4 reports and discusses our IV probit estimates of the determinants of retirement, and our IV estimates of the determinants of wealth, with the subjective survival probability being the main determinant of interest. Section 5 reports the results of retirement and wealth analysis based on the SHARE data.

2. HRS Data

In order to investigate the effects of subjective survival probabilities on retirement and wealth, we first use data drawn from the Health and Retirement Study (HRS). The HRS is a nationally representative panel survey of non-institutionalized individuals aged 51-61 in 1992 and their spouses or partners, who can be older or younger. The first wave of the HRS consists of 12,652 individuals. The HRS collects extensive information about retirement, health, and economic well-being of the respondents. After the initial wave of interviews in 1992, the subsequent waves of interviews were fielded biennially. We use the RAND HRS data file, which is a cleaned and streamlined version of the HRS with derived variables.

At the first wave of interviews in 1992, the HRS asked respondents 12 questions regarding their subjective probabilities about future events, including the following ones about surviving to target ages of 75 and 85. "Using any number from zero to ten where 0 equals absolutely no chance and 10 equals absolutely certain, what do you think are the chances you will live to be 75 or more?" "85 or more?" At the aggregate level, the answers to these questions about subjective survival probabilities have been found to be fairly reasonable: they aggregate well to averages that are close to survival probabilities calculated from life tables in cross-section, and vary with income, wealth, schooling, and risk factors such as smoking (Hurd and McGarry 1995). In panel analysis, the subjective survival probabilities to age 75 at wave 1, independent of self-assessed health status, predict actual mortality during the two years between waves 1 and 2 (Hurd and McGarry 2002).[8]

At the individual level, however, the quality of subjective survival probabilities seems to suffer from the presence of classical measurement error and focal points in responses (Hurd and McGarry 1995; Hurd, McFadden, and Gan 1998; Bassett and Lumsdaine 2001). Hurd and McGarry (1995) presented clear evidence of response error by showing that 2.5 percent of the respondents reported larger values for the survival probability to age 85 than for the survival probability to age 75. Hurd, McFadden, and Gan (1998) showed that due to cognition and response error many respondents systematically provided focal-point answers (0, 0.5, or 1) to the questions on subjective survival probabilities in the sample of older individuals (70 or older) in the Asset and Health Dynamics among the Oldest Old (AHEAD). Unlike the younger generation of respondents in the HRS, however, the older respondents in the AHEAD also reported average subjective survival probabilities that were substantially higher than those from life tables. Thus, the problem of focal points in responses may be a less severe one in the HRS than in the AHEAD. Finally, Bassett and Lumsdaine (2001) showed the possibility of systematic response error by showing that respondents who gave probabilistically inconsistent answers to the two questions regarding Social Security in the HRS also reported higher values for subjective survival probabilities.[9]

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[8] In the similar manner, Smith, Taylor, and Sloan (2001) showed that the subjective survival probabilities to age 75 at wave 3 predict mortality between waves 3 and 4. Note, however, that Siegel, Bradley, and Kasl (2003) found that if one controls for self-assessed health status, subjective survival probabilities to age 75 from the HRS are poor predictors of mortality during the three years after wave 1.

[9] The sum of the probabilities given for each of the two questions about Social Security—Social Security benefits can become more generous or become less generous—should be less than or equal to 100. According to Bassett and Lumsdaine (2001), about 1,500 respondents gave answers that summed to greater than 100.

In an effort to improve the information content in responses to the subjective survival probabilities in the AHEAD, Hurd, McFadden, and Gan (1998) transformed the error-ridden survival probabilities with focal points to continuous probabilities and showed that savings increases with their new survival probabilities among couples, but not among singles.[10] Yet they have not validated their new survival probabilities, for instance, by using actual mortality information from panel data. Using the entire set of an individual's responses to the subjective probabilities in the first wave of the HRS, Bassett and Lumsdaine (2001) have tried to control for errors due to unobserved individual heterogeneity. However, their benchmark measures performed poorly relative to the reported responses in validation using data from the third wave of the HRS.

In this paper, to control for these measurement errors in the HRS, we instrument the subjective survival probabilities of respondents using information on the mortality experience of their parents.[11] Hurd and McGarry (1995) showed that the parents' age or age of death are substantially correlated with the subjective survival probabilities of respondents, and the relationship between the parents' age of death and the subjective survival probabilities is nonlinear: the subjective survival probabilities of respondents are higher if the parents are alive than if the parents have died; if the parents died before age 51, the subjective survival probabilities of respondents are higher than if they died between 51 and 65, because at an early age the parents are likely to have died due to accidents; and if parents died at an age greater than 65, the subjective survival probabilities of respondents increase with the parents' ages at death.[12]

[10] Hurd, McFadden, and Gan (1998) used a simple ordered probit analysis where the dependent variable is the categorical information on whether each respondent is a net saver, a zero saver, or a net dissever.

[11] The instrumental variable estimation also deals with the potential bias due to endogeneity of the subjective survival probability, which may be present, even without the problem of measurement error, in cross-sectional regressions.

[12] Hurd, McFadden, and Gan (1998) also used the parental mortality experience to correct for errors in subjective survival probabilities in their sample from the AHEAD. They too found that greater parental longevity is in general

In panel analysis, Hurd and McGarry (2002) found that respondents modify their subjective survival probabilities in response to the death of a parent.

3. Validation

Using the sample of respondents whose actual mortality is known by wave 6 of the HRS in 2002, we test how well the instrumented survival probability to age 75, relative to the reported survival probability, from the first wave predicts actual mortality in the subsequent waves.[13] Our validation sample consists of 10,070 individuals who were 45-65 in 1992, not represented by a proxy interview at wave 1, and whose mortality status by wave 6 is known.[14] We have excluded those with missing data on subjective survival probabilities and the mortality of the parents. The cumulative mortality rate among this sample of 10,070 individuals is reported by each wave in Table 1. By wave 6 in 2002, almost 12 percent of the sample had died.

Figure 1 reports the histogram of the distribution of the reported subjective survival probability to age 75 that has been normalized to [0, 1] from [0, 10]. The figure clearly illustrates that there are substantial focal-point responses: more than 40 percent of the respondents answered that their survival probability to age 75 is either 0.5 or 1. The fact that respondents had to choose a number between 0 and 10 may have aggravated the problem of focal-point responses.

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associated with greater subjective probability of survival but the relationship was statistically significant only for female when father's longevity is higher. In addition to the differences in data, there are two differences that make the results by Hurd, McFadden, and Gan (1998) not directly comparable with those by Hurd and McGarry (1995). First, according to Hurd and McGarry (1995), the effects of parental longevity on the subjective survival probability of the respondents is not linear. Hurd, McFadden, and Gan (1998), however, employed a linear specification. Second, for surviving parents, Hurd and McGarry (1995) created a dummy variable, whereas Hurd, McFadden, and Gan (1998) used the expected age of death conditioned on the age attained, calculated from life tables.

[13] The following validation process is almost the same as that in Hurd and McGarry (2002).

[14] Outside the age range 51-61, the sample is not representative of the population in 1992. Yet we have included those respondents outside the age range 51-61, who are spouses or partners of age-eligible individuals, in our analysis in order to have more age variation and more number of observed deaths than in the age-eligible sample.

Table 2 shows how well this subjective survival probability at wave 1 predicts actual mortality between wave 1 and each subsequent wave by way of probit estimation. The dependent variable is equal to one if the individual has died by wave *t* (*t*=2, 3, 4, 5, and 6) and zero if he/she has survived. In addition to the subjective survival probability to age 75, we have included as explanatory variables other factors that would affect mortality such as age, sex, education, health status, disease conditions, smoking behavior, income, and wealth.[15]

Consistent with the findings of Hurd and McGarry (2002), higher values of subjective survival probability to age 75 significantly reduce the probability of dying by wave 2 in column 1 of Table 2. Significant coefficients on other explanatory variables have the expected signs. Mortality increases with age. Women have lower mortality rates than men. The four dummy variables for subjective health status (poor health is the reference group) are significant with the expected signs. Disease conditions increase mortality rates. Finally, current and past smoking also increases mortality rates.

When the question regarding the subjective survival probability to age 75 was asked to the respondents who were 45-65 years old in 1992, it was intended to measure the long-term mortality (or survival) probability over the next 10 to 30 years. Yet columns 2 through 5 of Table 2 reveal that when it comes to predicting the long-term mortality by waves 3 through 6, the reported survival probability does a rather poor job: the coefficient on the reported survival probability becomes smaller in magnitude and insignificant, though the sign is correct. Such an outcome is certainly possible given that the reported subjective survival probability is subject to measurement error.

In order to correct for measurement error, we have instrumented the reported subjective survival probability to age 75 by using 12 dummy variables for the mortality experience of the

[15] Hurd and McGarry (2002) used almost the same explanatory variables.

parents. Table 3 reports the results of the first-stage linear-probability estimation to predict the subjected survival probability to age 75. Other exogenous variables from the main mortality equation are also included and they show reasonable signs. For the 12 dummy variables for the mortality experience of the parents, the reference group consists of those respondents whose parents died between the ages of 50 and 65. In the first stage of the IV estimation, the coefficients on these instrumental variables are significant with the expected signs and magnitudes, even after controlling for smoking behavior and disease conditions. If the parents are alive, the subjective survival probability to age 75 of the respondent is greater by 0.051~0.095 than those whose parents died between the ages of 50 and 65. The effect of the parents' age of death on the subjective survival probabilities is nonlinear: if the parents died before age 50, the subjective survival probability to age 75 of the respondent increases by 0.037~0.040; if the parents died between the ages of 66 and 75, the subjective survival probability to age 75 increases by 0.023~0.027; and if the parents died after age 75, the subjective survival probability to age 75 increases even more.

Figure 2 reports the histogram and kernel density graph of the instrumented subjective survival probability based on the results reported in Table 3. In comparison with the histogram of the reported survival probability in Figure 1, the distribution of the instrumented subjective survival probability in Figure 2 is unimodal and continuous.

Table 4 reports the IV probit estimates of the mortality equation for each wave. In predicting the mortality by wave 2 in column 1, the coefficient on the instrumented survival probability is insignificant even though the sign is consistent with our expectation. In predicting the long-term mortality between waves 3 through 6, however, the coefficient on the instrumented survival probability becomes gradually larger in absolute magnitude, except for wave 3, and eventually significant in predicting long-term mortality by wave 6.[16] Therefore, given that the subjective survival probability to age 75 was intended to measure the long-term mortality (or survival) probability and thus life expectancy, the instrumented survival probability, which corrects for the measurement errors, performs substantially better than the reported survival probability. In the following sections, we employ this instrumented subjective survival probability and investigate the effects of subjective survival probabilities on retirement and wealth in the HRS data.

4. Empirical Results: HRS Data

4.a. Retirement Analysis

Using the summary labor force status variable in the RAND HRS data, we define individuals as being in the labor force if they are working full-time/part-time or unemployed. Respondents who are not in the labor force—retired, partially retired, disabled, or not in the labor force in the summary labor force status variable—are defined to be retired in our analysis.[17]

The sample used in our cross-sectional analysis of retirement consists of individuals aged 50-65 in 1992, who were not represented by a proxy respondent. We have excluded those with missing data on subjective survival probabilities and on parental mortality. We present the results using the subjective survival probabilities to age 75 as our measure of subjective survival

[16] Respondents who were 45-65 years old in wave 1 were 55-75 years old in wave 6. In column 5, the Wald test of exogeneity of the subjective survival probability to age 75 produced the p-value of 0.066.

[17] The summary labor force status variable in the RAND HRS data is based on the following information: working for pay, employment status, retired, looking for work, usual hours worked per week, usual weeks worked per year, and information on second job. Hurd, Smith, and Zissimopoulos (2004) used the same definition of retirement. According to Gustman and Steinmeier (2000), there are alternative definitions of retirement in the HRS. We plan to conduct further analyses based on these alternative definitions of retirement.

probabilities.[18] The final sample size for the cross-sectional retirement analysis is 9,155 respondents.

Figure 3 reports the retirement rate by age. The proportion of respondents retired rises with age, with sharp jumps between 61 and 62 and again between 64 and 65. These jumps correspond to the availability of reduced Social Security benefits and of full Social Security benefits, respectively.

We have conducted separate analyses by household living arrangements (i.e., single or couple) and by sex. In addition to the subjective survival probability to age 75 and a standard set of demographic variables—age, three race/ethnicity dummies (the reference group is white), years of education, and the number of children, we have also generated, as the independent variables four dummy variables describing the self-reported health status (the reference group is "poor health") and a dummy variable for the presence of a health problem that limits the kind or amount of paid work the respondent can do. For couples, we have also included the same set of explanatory variables for the spouse, including the survival probability of the spouse. In the instrumental estimation, therefore, the survival probabilities of both spouses are instrumented using the parental mortality experience of both spouses.

Table 5 reports the coefficients from the retirement probit and the IV retirement probit for singles. Because of the age eligibility restrictions in the HRS, most of the singles in our sample are under age 62. Among singles, there is no evidence that higher subjective survival probabilities decrease the probability of retirement, regardless of sex and estimation method. Other significant variables are consistent with the findings in the literature. Older individuals are more likely to have retired in our sample.[19] Better-educated women are less likely to have

[18] The results do not substantially change when the subjective survival probabilities to age 85 are used instead.
[19] The reference group is age 50.

retired than less educated women. Those with poor health and health problems are more likely to have retired than those with better health and no health problems.

The conclusions from Table 5 regarding the effect of subjective survival probability on retirement still do not change in Table 6, where the coefficients for couples of the retirement probit and the IV retirement probit are reported. Both coefficients on the subjective survival probabilities of both spouses are insignificant. The coefficients on the age dummy variables among men clearly demonstrate sharp jumps at ages 62 and 65. Having older spouses increases the likelihood of retirement, regardless of sex.

Overall, the analyses in this section show no evidence that higher subjective survival probabilities decrease the probability of retirement, regardless of couple status, sex, and estimation method.

4.b. Wealth Analysis

Wealth is defined as the sum of all household wealth components less all debt, exclusive of Social Security and pension wealth. We use imputed values in the RAND HRS data when any of the wealth components is missing. The unit of analysis is a household because wealth is measured at the household level. We have done separate analyses by couple status. Figure 4 presents the distribution of wealth by couple status. Because there are some households with zero or negative wealth, we use the dollar amount (in $1,000s) of wealth as the dependent variable, instead of using a logarithmic format of wealth.

Table 7 reports the results of the OLS and IV estimation of the wealth equation for singles. The same set of explanatory variables as those used in the retirement equation are used in the wealth equation.[20] Among singles, there is no evidence that higher subjective survival probabilities increase the wealth of the respondent. Other explanatory variables show expected signs. Women have less wealth than men. Blacks have less wealth than whites. Consistent with the literature, better-educated people have more wealth.

Finally, Table 8 shows the results of the OLS and IV estimation of the wealth equation among couples. Here, higher subjective survival probabilities of both spouses significantly increase the wealth of the household in the IV estimation. This difference by couple status in the effect of subjective survival probabilities on wealth is also consistent with the findings of Hurd, McFadden, and Gan (1998).

5. SHARE Data and Results

5. a. SHARE Data

In this section we use data drawn from the Survey of Health, Ageing and Retirement in Europe (SHARE) to analyze if the conclusions based on the HRS data in the preceding section still apply to the European data. The SHARE is a longitudinal survey of individuals aged over 50 and their spouses in 11 European countries (Austria, Germany, Sweden, the Netherlands, Spain, Italy, France, Denmark, Greece, Switzerland, and Belgium) that began in 2004. Having been designed after the HRS as one of the role models, the SHARE collects almost the same variables as those in the HRS on retirement, health, and economic well-being as well as subjective survival probability of the representative sample from each country. We use Release 1 of the SHARE data which consists of 22,777 individuals from 10 countries.[21]

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[20] Instead of the age dummy variables, we have included age and its square in the wealth equation.
[21] The data from Belgium had not yet been included in the first data release in April 2005.

The SHARE asked respondents the following question on the subjective survival probability. "(On a scale from 0 to 100) What are the chances that you will live to be age T or more?" The target age, T, varied according to the respondent's age, as shown in Table 9. Hurd, Rohwedder, and Winter (2005) showed that the subjective survival probabilities in the SHARE also vary with income, wealth, and health conditions, as well as with the parental mortality experience. They also pointed out that the subjective survival probabilities in the SHARE suffer from measurement error and focal point responses.[22]

5. b. Retirement Analysis

Using the self-reported labor force status variable, we define individuals as being in the labor force if they are employed, including self-employed, or unemployed. Respondents who are not in the labor force—retired, permanently sick or disabled, or homemaker—are defined to be retired in our analysis.

In order to make the subjective survival probabilities comparable between the SHARE and the HRS, we have restricted our analysis to the sample of individuals aged 50-65 in the SHARE who reported the subjective survival probability to age 75. We have excluded those with missing data on subjective survival probabilities, the mortality of the parents, and other explanatory variables. The final sample size for the retirement analysis is 10,706 individuals.

We have done separate analyses by couple status and sex. Because the number of observations is too small for many countries, we have pooled the observations from all ten countries and included nine country dummies (the reference group is Austria). In addition to the

[22] They demonstrated that in the SHARE, female respondents aged 70 and younger tend to underestimate their survival probabilities compared with the survival probabilities from life tables, while such a tendency is less pronounced among male respondents aged 70 and younger. Additionally, the subjective survival probabilities in the SHARE are subject to the nonresponse problem that varies across countries and age, though it is less severe among respondents aged 70 and younger.

subjective survival probability to age 75, we have employed the same set of explanatory variables as those used in the retirement analysis based on the HRS data: age dummies, years of education,[23] number of children, four dummy variables for the self-reported health status, and a dummy for the presence of a health problem that limits activities people usually do.

Table 10 shows no evidence that higher subjective survival probabilities decrease the probabilities decrease the probability retirement among singles. The coefficients on the subjective survival probability to age 75 are all negative but insignificant. Higher ages increase the probability of retirement, whereas more years of education reduce the probability of retirement. The fact that all of the country dummy variables are significant shows that there is substantial heterogeneity across countries in the probability of retirement even after other explanatory variables have been controlled for.

Table 11 reports the coefficients of the retirement probit and IV probit estimation for couples. Different from the retirement analysis for couples in the HRS, the explanatory variables for spouse are not included in the retirement analysis using the SHARE data for the following two reasons. First, detailed demographic information for spouse is not available for about twenty percent of the partnered individuals in the SHARE. Second, because of age difference between the spouses, many couples have different target age in the question for subjective survival probability and thus cannot be used in our analysis.

In columns 1 and 2 of Table, there is no evidence that higher subjective survival probabilities decrease the probability of retirement among married men. However, column 3 of Table 11 surprisingly shows that higher subjective survival probabilities significantly decrease

[23] In the SHARE, the question on the highest educational degree obtained varies across countries, mirroring the variation in the education systems across countries. In our analysis, therefore, we have used the years of education that have been provided as one of the generated variables in the SHARE, based on the 1997 *International Standard Classification of Education*.

the probability of retirement among married women. The result of the Wald test of exogeneity indicates that one cannot reject the null hypothesis that the probit estimate is consistent. This result merits further investigation.

5. c. Wealth Analysis

The dependent variable in the wealth analysis is the household net worth—sum of real and net financial assets—in euros, which has been adjusted by using purchasing power parities to correct for price level differences across countries. When any of the net worth components is missing, imputed values from the SHARE are used. The SHARE provides five imputed data sets for asset variables and we have combined the results from all five data sets using the hotdeck package in Stata, following the suggestion by Christelis, Jappelli, and Padula (2005). The reported coefficients are the simple average of the five separate estimates and the reported standard errors are derived from the weighted average of the within-imputation variance and the between-imputation variance.

Table 12 reports the results of the OLS and IV estimation of the wealth equation for singles, based on the five imputed data sets. The coefficients on the subjective survival probability to age 75 are positive but insignificant. The results for couples reported in Table 13, however, provide some evidence that people with higher subjective survival probabilities have more wealth: the coefficient on the subjective survival probability to 75 in column 1 is positive and significant at the 10 percent level of significance. The results of the Durbin-Wu-Hausman test cannot reject the null hypothesis that the OLS estimate in column 1 of Table 13 is consistent.

Overall, the retirement and wealth analysis using data from the SHARE provide mixed results. Similar to the results based on the HRS, higher subjective survival probabilities increase wealth among couples in the analysis using the SHARE data. But different from the results based on the HRS, higher subjective survival probabilities also reduce the probability of retirement among married women in the SHARE data.

Another noteworthy finding is that the significant results in the SHARE data are all from the non-instrumented measures of the subjective survival probabilities, whereas the significant results in the HRS are from the instrumented measures of the subjected survival probabilities.[24] Reconciling these differences between the HRS and the SHARE will be a part of future research.

6. ELSA Data and Results

6. a. ELSA Data

In this section we use data drawn from the English Longitudinal Study of Ageing (ELSA) to repeat the analyses in the preceding sections. The ELSA began in 2002 and is a longitudinal survey of individuals aged over 50 and their spouses living in private households in England. The ELSA also collects almost the same variables as those in the HRS on retirement, health, and economic well-being as well as subjective survival probability. We use Wave 1 of the ELSA data from 2002 which consists of 12,100 individuals

The question on the subjective survival probability in the ELSA also has a target age that varied according to the respondent's age. In order to make the subjective survival probabilities comparable to the SHARE and the HRS, we have restricted our analysis to the sample of individuals aged 50-65 in the ELSA who reported the subjective survival probability to age 75.

6. b. Retirement Analysis

[24] The dummy variables for the parental mortality experience were significant in the first stage estimations for both the HRS and the SHARE.

Using the self-reported labor force status variable, we define individuals as being in the labor force if they are employed, including self-employed, or unemployed. Respondents who are not in the labor force—retired, semi-retired, permanently sick or disabled, or looking after home or family—are defined to be retired in our analysis.[25]

We have excluded those with missing data on subjective survival probabilities, the mortality of the parents, and other explanatory variables. The final sample size for the retirement analysis is 5,683 individuals.

We have done separate analyses by couple status and sex. In addition to the subjective survival probability to age 75, we have employed the same set of explanatory variables as those used in the retirement analysis based on the HRS data: age dummies, six educational qualification dummies,[26] number of children, four dummy variables for the self-reported health status, and a dummy for the presence of any long-standing illness or disability that limits activities. Different from the analyses with the HRS and SHARE, however, we have used 10 dummy variables for the mortality experience of the parents in the ELSA. Instead of having two dummies for the respondents whose living parents are less than 75 and two dummies for those whose living parents are between the ages of 75 and 85, we have created two dummy variables for the respondents whose living parents are less than age 85 because there are too few respondents whose living parents are less than 75 years of age in the ELSA

Table 14 shows no evidence that higher subjective survival probabilities decrease the probabilities decrease the probability retirement among singles. The coefficients on the subjective survival probability to age 75 are all negative but insignificant.

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[25] Respondents who reported “other” for the labor force status (31 observations) are excluded in our analysis.

[26] Six educational qualification dummy variables are Foreign/other qualification, National Vocational Qualification (NVQ) level 1, NVQ level 2, NVQ level 3, higher ed below degree, and NVQ levels 4 or 5. No qualification is the reference group. Years of education are not available in the ELSA.

Table 15 reports the coefficients of the retirement probit and IV probit estimation for couples. Because of age differences between the spouses, many couples have different target ages in the question for subjective survival probability in the ELSA, just as it was the case with the SHARE. Therefore, the explanatory variables for the spouse are not included in the retirement analysis using the ELSA data.[27] Table 15 shows that there is no evidence that higher subjective survival probabilities decrease the probability of retirement, regardless of sex and estimation method.

6. c. Wealth Analysis

The dependent variable in the wealth analysis is the household net (non-pension) wealth in pounds. Tables 16 and 17 report the results of the OLS and IV estimation of the wealth equation for singles and couples, respectively. Different from the results based on the HRS data, the coefficient on the subjective survival probability to age 75 is positive and significant also among singles in the IV estimation in Table 16. The results for couples reported in Table 17 show the same results as those based on the HRS. And in both tables, the results of the Durbin-Wu-Hausman test reject the null hypothesis that the OLS estimates are consistent.

Overall, the retirement and wealth analysis using data from the ELSA more or less confirms the findings based on the HRS data. Higher subjective survival probabilities do not decrease the probability of retirement but increase wealth among both singles and couples in the analysis using the ELSA data.

[27] Also detailed demographic information for the spouse is not available for about five percent of the partnered individuals in the ELSA.

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Table 1 Mortality Rate by Wave 2 through 6

	Cumulative number died	Cumulative percent died
Wave 2	171	1.70
Wave 3	379	3.76
Wave 4	596	5.92
Wave 5	867	8.61
Wave 6	1,199	11.91
Number of observations	10,070	

Figure 1 Histogram of the Reported Survival Probability to Age 75

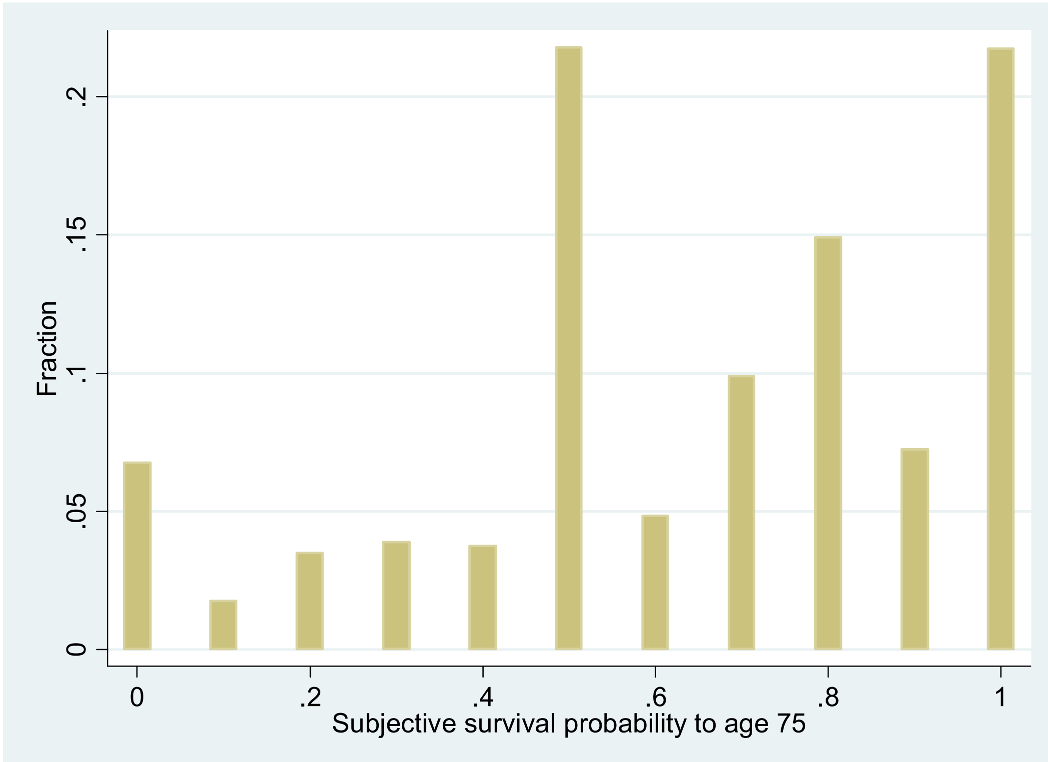


Table 2 Probit Estimation of the Observed Mortality, Waves 2 through 6

	(1) Wave 2	(2) Wave 3	(3) Wave 4	(4) Wave 5	(5) Wave 6
Survival probability to 75	-.200*	-.137	-.122	-.041	-.059
	(.111)	(.085)	(.076)	(.070)	(.064)
Age	.016*	.017**	.032**	.037**	.039**
	(.009)	(.007)	(.006)	(.005)	(.005)
Female	-.272**	-.314**	-.242**	-.290**	-.305**
	(.076)	(.059)	(.050)	(.044)	(.041)
Black	.179*	.210**	.199**	.117**	.090*
	(.094)	(.070)	(.061)	(.056)	(.051)
Hispanic	.011	-.087	-.051	-.163*	-.176**
	(.143)	(.110)	(.096)	(.086)	(.077)
Other	-.084	.230	.130	.088	-.012
	(.258)	(.160)	(.150)	(.134)	(.140)
Years of education	-.003	-.005	.004	-.004	-.007
	(.012)	(.010)	(.008)	(.007)	(.007)
Married	-.135*	-.143**	-.071	-.090*	-.129**
	(.081)	(.061)	(.052)	(.048)	(.043)
Excellent	-.515**	-.490**	-.527**	-.565**	-.594**
	(.152)	(.117)	(.104)	(.095)	(.085)
Very good	-.493**	-.491**	-.434**	-.514**	-.543**
	(.136)	(.103)	(.091)	(.083)	(.077)
Good	-.506**	-.472**	-.424**	-.412**	-.431**
	(.114)	(.089)	(.080)	(.073)	(.068)
Fair	-.267**	-.222**	-.216**	-.186**	-.198**
	(.103)	(.083)	(.077)	(.070)	(.066)
High blood pressure	.149*	.227**	.172**	.230**	.216**
	(.076)	(.057)	(.049)	(.044)	(.040)
Diabetes	.247**	.452**	.531**	.513**	.520**
	(.097)	(.072)	(.062)	(.058)	(.054)
Cancer	.797**	.684**	.610**	.660**	.552**
	(.098)	(.087)	(.079)	(.072)	(.070)
Lung disease	.247**	.334**	.345**	.367**	.407**
	(.113)	(.086)	(.076)	(.071)	(.067)
Ever had heart attack	.309**	.318**	.304**	.352**	.289**
	(.087)	(.068)	(.060)	(.054)	(.051)
Stroke	.349**	.280**	.270**	.376**	.496**
	(.145)	(.122)	(.110)	(.101)	(.094)
Arthritis	-.075	.022	-.019	-.071	-.093**
	(.075)	(.056)	(.049)	(.044)	(.041)
BMI	-.001	-.019**	-.014**	-.014**	-.010**
	(.007)	(.006)	(.006)	(.005)	(.004)
Smoker	.319**	.390**	.504**	.526**	.572**
	(.095)	(.071)	(.060)	(.055)	(.049)
Former smoker	.201**	.191**	.236**	.270**	.261**
	(.089)	(.069)	(.059)	(.055)	(.047)
Pseudo R-square	0.1843	0.1805	0.1716	0.1896	0.1882
Log pseudo likelihood	-706.82	-1323.29	-1874.67	-2394.49	-2984.37
Number of observations			10,070		

NOTE: Robust standard errors in parentheses. The reported regressions also include income and its square, wealth and its square.
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

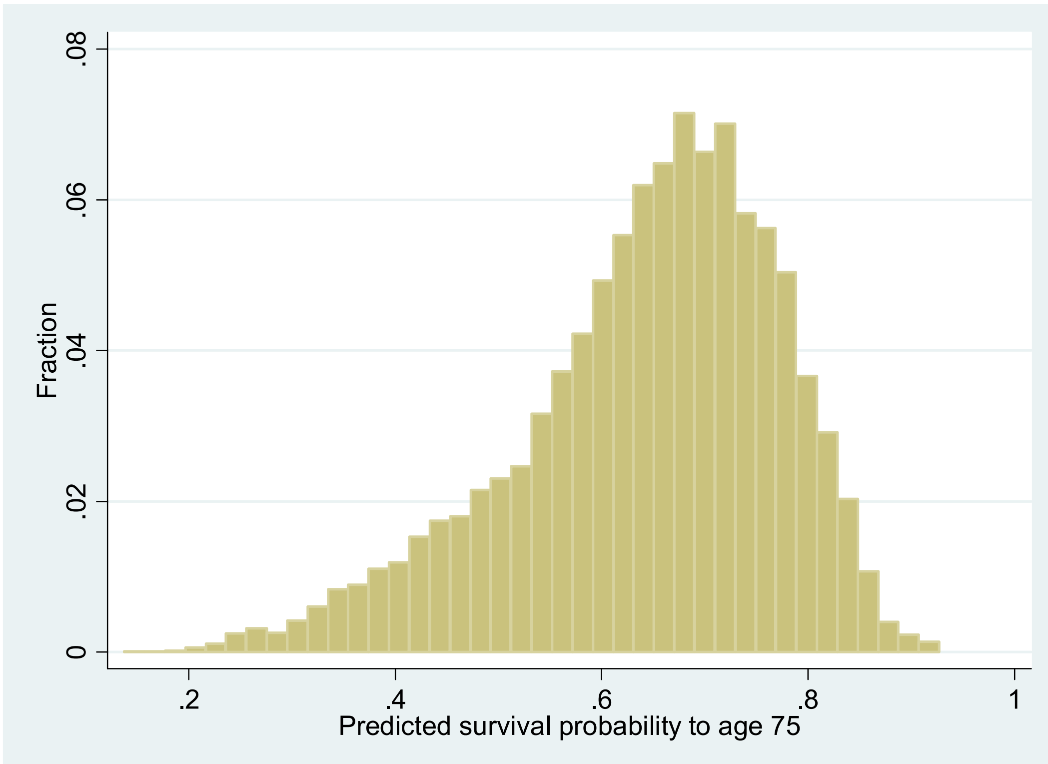
Table 3 First-stage Regression Results in IV Probit: Linear Probability of Survival to Age 75

	(1) Coefficient	(2) Standard error
Age	.004**	.001
Female	.036**	.006
Black	.069**	.009
Hispanic	-.040**	.012
Other	.010	.020
Years of education	.005**	.001
Married	-.0001	.007
Excellent	.343**	.016
Very good	.266**	.015
Good	.213**	.015
Fair	.114**	.015
High blood pressure	-.012*	.006
Diabetes	-.013	.011
Cancer	-.028**	.013
Lung disease	-.032**	.014
Ever had heart attack	.040**	.010
Stroke	.014	.021
Arthritis	.003	.006
BMI	-.0001	.001
Smoker	-.027**	.007
Former smoker	.007	.006
Parent alive		
Mother's age < 75	.088**	.012
Father's age < 75	.051**	.017
Mother's age 75-85	.075**	.009
Father's age 75-85	.072**	.009
Mother's age > 85	.095**	.013
Father's age > 85	.080**	.015
Parent dead		
Mother's age of death < 50	.040**	.014
Father's age of death < 50	.037**	.011
Mother's age of death 66-75	.023**	.011
Father's age of death 66-75	.027**	.008
Mother's age of death > 75	.057**	.010
Father's age of death > 75	.077**	.008
R-squared	0.1846	
Number of observations	10,070	

NOTE: The reported regressions also include income and its square, wealth and its square.
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

Figure 2 Distribution of the Instrumented Survival Probability to Age 75

Panel A. Histogram



Panel B. Kernel Density

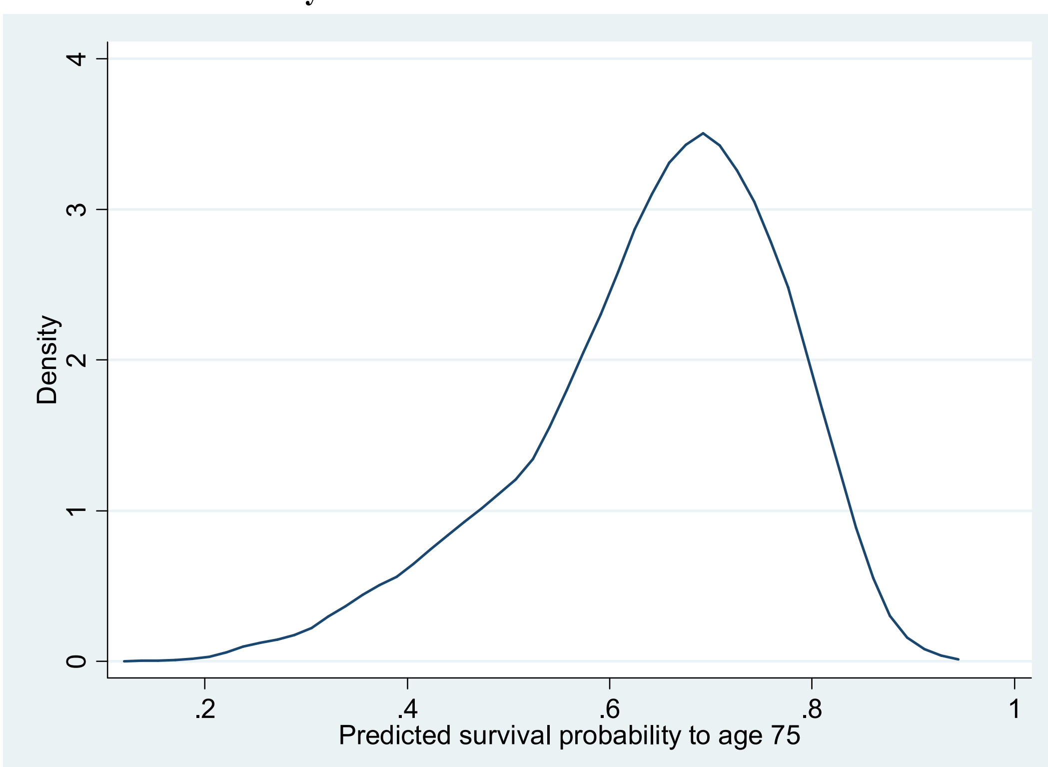


Table 4 IV Probit Estimation of the Observed Mortality, Waves 2 through 6

	(1) Wave 2	(2) Wave 3	(3) Wave 4	(4) Wave 5	(5) Wave 6
Survival probability to 75	-.263	.073	-.321	-.392	-.807**
	(.830)	(.620)	(.534)	(.460)	(.399)
Age	.017*	.016**	.032**	.038**	.041**
	(.009)	(.007)	(.006)	(.005)	(.005)
Female	-.270**	-.321**	-.235**	-.276**	-.274**
	(.082)	(.063)	(.054)	(.048)	(.045)
Black	.183*	.195**	.212**	.140**	.140**
	(.110)	(.083)	(.071)	(.064)	(.056)
Hispanic	.009	-.079	-.058	-.174**	-.197**
	(.147)	(.112)	(.097)	(.087)	(.077)
Other	-.084	.228	.132	.090	-.006
	(.257)	(.160)	(.149)	(.133)	(.137)
Years of education	-.003	-.006	.006	-.002	-.003
	(.012)	(.010)	(.009)	(.008)	(.007)
Married	-.135*	-.142**	-.071	-.090*	-.127**
	(.081)	(.061)	(.052)	(.048)	(.043)
Excellent	-.493	-.562**	-.458**	-.441**	-.324*
	(.320)	(.237)	(.218)	(.191)	(.173)
Very good	-.476*	-.547**	-.379**	-.416**	-.329**
	(.257)	(.188)	(.172)	(.152)	(.140)
Good	-.493**	-.516**	-.381**	-.334**	-.261**
	(.214)	(.156)	(.141)	(.126)	(.117)
Fair	-.260*	-.245**	-.193**	-.146*	-.110**
	(.140)	(.107)	(.098)	(.088)	(.082)
High blood pressure	.148*	.229**	.169**	.224**	.201**
	(.078)	(.057)	(.050)	(.045)	(.041)
Diabetes	.245**	.455**	.527**	.504**	.497**
	(.098)	(.071)	(.063)	(.059)	(.056)
Cancer	.795**	.690**	.603**	.647**	.518**
	(.104)	(.088)	(.081)	(.075)	(.073)
Lung disease	.245**	.342**	.337**	.351**	.370**
	(.118)	(.088)	(.079)	(.073)	(.070)
Ever had heart attack	.307**	.327**	.295**	.336**	.252**
	(.094)	(.072)	(.065)	(.059)	(.056)
Stroke	.349**	.277**	.271**	.377**	.493**
	(.144)	(.122)	(.109)	(.101)	(.093)
Arthritis	-.075	.021	-.018	-.069	-.088**
	(.075)	(.056)	(.049)	(.044)	(.040)
BMI	-.001	-.019**	-.014**	-.014**	-.010**
	(.007)	(.006)	(.006)	(.005)	(.004)
Smoker	.317**	.396**	.497**	.513**	.537**
	(.100)	(.073)	(.063)	(.058)	(.055)
Former smoker	.202**	.190**	.237**	.271**	.259**
	(.088)	(.069)	(.059)	(.052)	(.046)
Log pseudo likelihood	-1715.35	-2331.76	-2883.13	-3402.73	-3991.21
Number of observations			10,070		

NOTE: Robust standard errors in parentheses. The reported regressions also include income and its square, wealth and its square.
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

Figure 3 Proportion Retired by Age

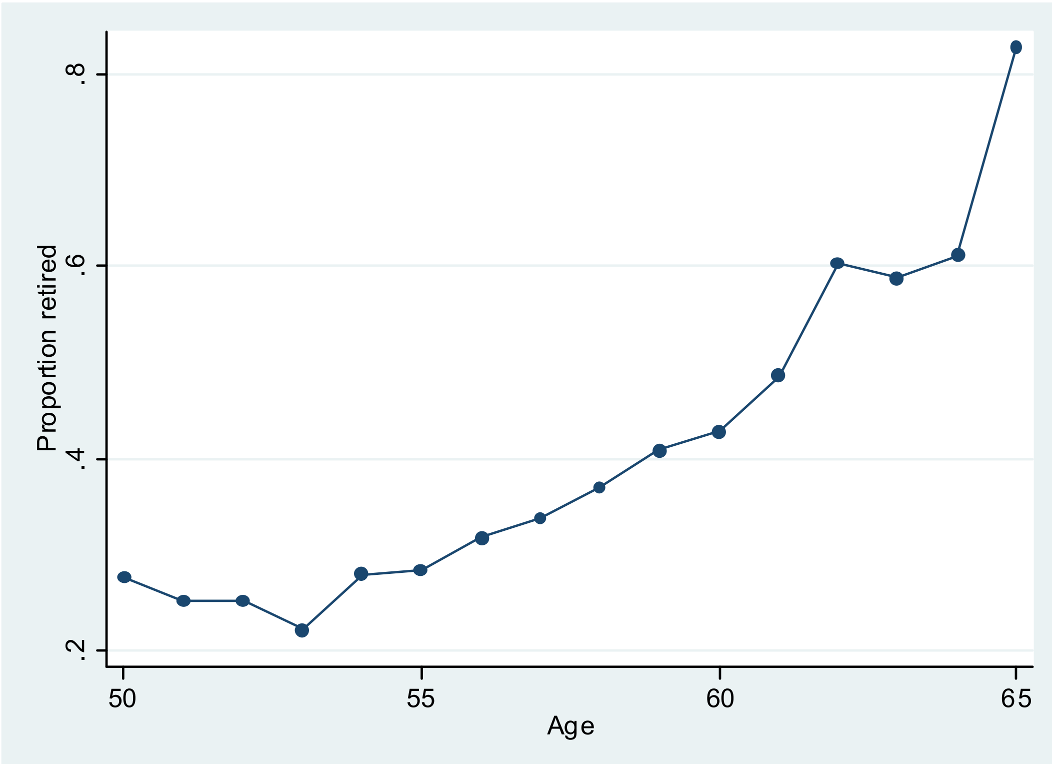


Table 5 Retirements Probit Estimation, Singles

	Men		Women	
	(1)	(2)	(3)	(4)
	Probit	IV Probit	Probit	IV Probit
Survival probability to 75	.101 (.211)	1.075 (1.334)	-.041 (.138)	.595 (.828)
Age 51	.823* (.438)	.839* (.446)	.173 (.250)	.222 (.261)
Age 52	.609 (.430)	.664 (.447)	-.024 (.259)	.019 (.269)
Age 53	.525 (.431)	.575 (.444)	.057 (.258)	.099 (.266)
Age 54	.561 (.445)	.522 (.457)	.077 (.251)	.134 (.265)
Age 55	.305 (.453)	.345 (.463)	-.059 (.263)	-.042 (.266)
Age 56	.604 (.443)	.610 (.452)	.259 (.249)	.321 (.264)
Age 57	.708 (.433)	.697 (.441)	.194 (.251)	.238 (.259)
Age 58	1.295** (.437)	1.274** (.443)	.235 (.250)	.304 (.269)
Age 59	1.007** (.437)	.968** (.446)	.515** (.250)	.551** (.256)
Age 60	.762* (.443)	.736 (.451)	.737** (.243)	.788** (.256)
Age 61	1.414** (.454)	1.478** (.478)	.810** (.255)	.841** (.262)
Black	.291** (.148)	.152 (.230)	.266** (.092)	.231** (.102)
Hispanic	.415* (.233)	.387 (.243)	.245* (.141)	.287* (.153)
Other	.148 (.589)	.077 (.627)	.430* (.246)	.448* (.252)
Years of education	.026 (.021)	.021 (.022)	-.057** (.015)	-.062** (.016)
Excellent	-1.076** (.297)	-1.498** (.683)	-.781** (.188)	-.996** (.339)
Very good	-.861** (.272)	-1.199** (.563)	-.608** (.169)	-.757** (.260)
Good	-.877** (.250)	-1.151** (.484)	-.754** (.158)	-.875** (.226)
Fair	-.484** (.238)	-.624* (.328)	-.524** (.148)	-.582** (.168)
Health limits work	1.610** (.160)	1.544** (.170)	1.457** (.106)	1.468** (.110)
Number of children	-.019 (.029)	-.024 (.032)	.020 (.019)	.014 (.021)
P-value of Wald test of exogeneity	.5193		.4426	
Proportion retired	.326		.337	
Number of observations	681		1,514	

NOTE: Standard errors in parentheses. Three observations in the male equation and one observation in the female equation are dropped because age dummies perfectly predict outcomes.
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

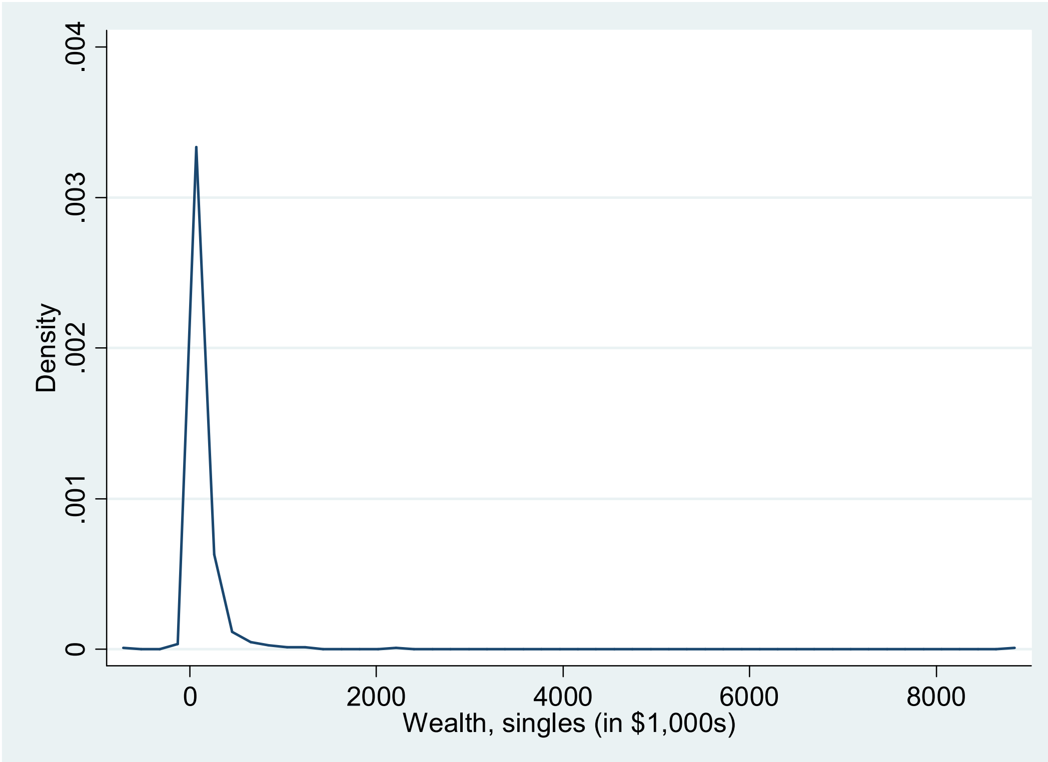
Table 6 Retirements Probit Estimation, Couples

	Men		Women	
	(1) Probit	(2) IV Probit	(3) Probit	(4) IV Probit
Survival probability to 75	-.147 (.095)	.526 (.503)	.132 (.094)	-.474 (.427)
Spouse survival probability to 75	.039 (.102)	-.443 (.467)	.059 (.089)	-.164 (.504)
Self characteristics				
Age 51	-.047 (.211)	-.045 (.214)	.144 (.115)	.143 (.117)
Age 52	.143 (.209)	.116 (.213)	.116 (.117)	.112 (.120)
Age 53	-.011 (.212)	-.026 (.216)	-.126 (.120)	-.123 (.122)
Age 54	.388* (.207)	.358* (.212)	-.069 (.119)	-.068 (.121)
Age 55	.418** (.203)	.396* (.207)	-.010 (.118)	-.017 (.120)
Age 56	.440** (.203)	.402* (.208)	.191 (.121)	.182 (.123)
Age 57	.422** (.203)	.401* (.208)	.150 (.125)	.137 (.127)
Age 58	.441** (.207)	.409* (.211)	.194 (.125)	.217* (.128)
Age 59	.640** (.205)	.575** (.213)	.266** (.128)	.256** (.129)
Age 60	.720** (.203)	.650** (.212)	.331** (.130)	.321** (.133)
Age 61	.923** (.207)	.872** (.212)	.486** (.138)	.473** (.141)
Age 62	1.540** (.212)	1.444** (.222)	.888** (.263)	.945** (.273)
Age 63	1.427** (.221)	1.339** (.230)	1.568** (.407)	1.586** (.403)
Age 64	1.423** (.226)	1.361** (.234)	1.048** (.362)	1.108** (.371)
Age 65	2.312** (.252)	2.201** (.266)	.984** (.392)	.996** (.394)
Black	.063 (.263)	.034 (.269)	-.056 (.281)	-.030 (.285)
Hispanic	.109 (.210)	.098 (.213)	-.171 (.208)	-.194 (.213)
Other	-.418* (.247)	-.430* (.250)	-.057 (.222)	-.083 (.224)
Years of education	.006 (.010)	.006 (.010)	-.075** (.012)	-.069** (.013)
Excellent	-.770** (.132)	-.977** (.225)	-.669** (.150)	-.449* (.212)
Very good	-.809** (.126)	-.968** (.192)	-.668** (.144)	-.491** (.189)
Good	-.776** (.119)	-.891** (.161)	-.588** (.140)	-.451** (.169)
Fair	-.721** (.120)	-.758** (.132)	-.345** (.143)	-.254 (.157)
Health limits work	1.192** (.071)	1.220** (.075)	.746** (.072)	.738** (.073)
Spouse characteristics				
Age	.013** (.006)	.015** (.006)	.019** (.005)	.021** (.007)
Black	.162 (.269)	.148 (.274)	-.208 (.279)	-.187 (.284)
Hispanic	-.136 (.199)	-.182 (.205)	.005 (.202)	.018 (.205)
Other	.173 (.205)	.178 (.208)	-.293 (.200)	-.247 (.204)
Years of education	.008 (.013)	.007 (.014)	.007 (.009)	.009 (.009)
Excellent	-.083 (.153)	.080 (.221)	-.066 (.129)	.059 (.228)
Very good	-.083 (.147)	.052 (.196)	-.043 (.123)	.064 (.194)
Good	-.153 (.143)	-.047 (.177)	-.134 (.116)	-.044 (.165)
Fair	.000 (.144)	.073 (.159)	-.160 (.117)	-.103 (.132)
Health limits work	-.057 (.078)	-.074 (.080)	-.041 (.070)	-.042 (.072)
Household characteristics				
Number of children	-.013 (.013)	-.014 (.014)	.001 (.012)	.004 (.013)
P-value of Wald test of exogeneity	.2509		.3100	
Proportion retired	.265		.440	
Number of observations	3,651		3,101	

NOTE: Standard errors in parentheses.
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

Figure 4 Kernel Density Graph of Wealth

Panel A. Singles



Panel B. Couples

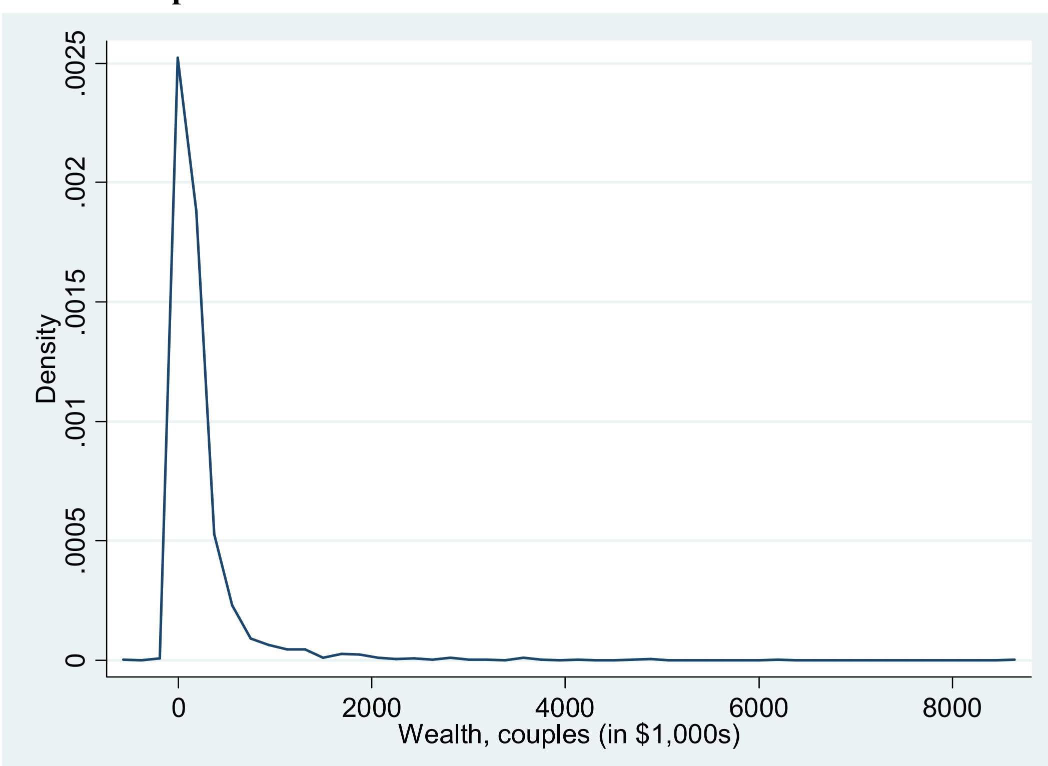


Table 7 Wealth Regression Results, Single Households

Dependent variable: Household wealth (in $1,000s)

	(1) OLS	(2) IV
Survival probability to 75	9.40 (20.28)	227.45 (141.29)
Age	-7.29 (67.59)	4.61 (69.78)
Age squared	.09 (.61)	-.01 (.63)
Female	-49.32** (12.92)	-59.96** (14.91)
Black	-69.32** (13.83)	-86.20** (17.84)
Hispanic	-29.41 (21.51)	-20.56 (22.78)
Other	-24.77 (39.09)	-21.57 (40.17)
Years of education	15.05** (2.06)	13.68** (2.29)
Excellent	25.50 (27.85)	-57.05 (60.13)
Very good	33.84 (26.00)	-26.70 (47.09)
Good	-8.97 (24.16)	-58.88 (40.48)
Fair	10.49 (22.15)	-13.70 (27.51)
Health limits work	-29.15 (17.15)	-27.45 (17.63)
Number of children	-2.97 (2.85)	-5.09 (3.22)
Constant	85.09 (1878.98)	-304.38 (1644.19)
R-square	.0815	.0329
P-value of Durbin-Wu-Hausman test of endogeneity	.1094	
Number of observations	2,198	

NOTE: Standard errors in parentheses.
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

Table 8 Wealth Regression Results, Couple Households

Dependent variable: Household wealth (in $1,000s)

	(1) OLS	(2) IV
Survival probability to 75	19.70 (27.32)	256.68* (147.92)
Spouse survival probability to 75	14.74 (29.07)	345.49** (136.64)
Husband's characteristics		
Age	48.46 (51.87)	30.89 (53.82)
Age squared	-.38 (.45)	-.23 (.47)
Black	-124.83 (78.18)	-140.21* (80.96)
Hispanic	-152.81** (58.94)	-145.11** (60.83)
Other	-70.15 (62.68)	-90.62 (65.03)
Years of education	12.99** (2.91)	11.92** (3.02)
Excellent	108.88** (39.78)	-1.37 (67.33)
Very good	39.02 (38.06)	-51.19 (57.89)
Good	5.14 (36.24)	-64.79 (49.12)
Fair	9.29 (36.77)	-30.69 (40.86)
Health limits work	-29.20 (22.26)	-24.92 (23.64)
Wife's characteristics		
Age	14.84 (12.92)	20.11 (13.44)
Age squared	-.09 (.13)	-.15 (.13)
Black	18.66 (79.99)	-.11 (82.73)
Hispanic	150.88** (55.65)	148.11** (57.97)
Other	24.44 (57.42)	20.97 (59.21)
Years of education	17.13** (3.63)	13.50** (3.94)
Excellent	85.37* (43.85)	-29.40 (64.57)
Very good	68.01 (42.20)	-23.71 (57.37)
Good	9.25 (40.70)	-64.42 (51.41)
Fair	10.83 (41.52)	-32.61 (46.63)
Health limits work	-25.26 (22.65)	-23.92 (23.55)
Household characteristics		
Number of children	-6.05 (3.84)	-7.03* (3.98)
Constant	-2242.05 (1503.85)	-1978.91 (1554.04)
R-square	.0943	.0371
P-value of Durbin-Wu-Hausman test of endogeneity	.0067	
Number of observations	3,651	

NOTE: Standard errors in parentheses
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

Table 9 Target Ages in the Subjective Survival Probability Question

Age class of the respondent	Target age
51 to 65	75
66 to 70	80
71 to 75	85
76 to 80	90
81 to 85	95
86 to 95	100
96 to 100	105
101 to 105	110
106 and older	120

Source: Guiso, Tiseno, and Winter (2005: 335)

Table 10 Retirements Probit Estimation, Singles

	Men		Women	
	(1) Probit	(2) IV Probit	(3) Probit	(4) IV Probit
Survival probability to 75	-.167 (.249)	-1.965 (2.236)	-.162 (.179)	-.306 (1.454)
Age 51	.217 (.394)	.240 (.408)	.186 (.258)	.182 (.263)
Age 52	.222 (.419)	.307 (.445)	.128 (.248)	.118 (.253)
Age 53	.385 (.401)	.378 (.415)	.132 (.256)	.133 (.272)
Age 54	.531 (.383)	.434 (.408)	.250 (.242)	.245 (.254)
Age 55	.283 (.399)	.307 (.413)	.285 (.250)	-.269 (.274)
Age 56	.908** (.370)	.790** (.403)	.759** (.242)	.751** (.249)
Age 57	.909** (.380)	.862** (.394)	.739** (.243)	.738** (.271)
Age 58	1.006** (.392)	.978** (.404)	.583** (.241)	.578** (.251)
Age 59	.695* (.394)	.856* (.460)	.717** (.248)	.709** (.255)
Age 60	1.641** (.373)	1.670** (.390)	1.210** (.238)	1.196** (.245)
Age 61	1.803** (.382)	1.679** (.413)	1.372** (.249)	1.364** (.263)
Age 62	1.605** (.380)	1.580** (.392)	1.679** (.262)	1.663** (.267)
Age 63	2.257** (.410)	2.302** (.432)	1.884** (.269)	1.866** (.271)
Age 64	2.293** (.385)	2.345** (.405)	2.115** (.269)	2.102** (.285)
Age 65	3.019** (.472)	3.147** (.520)	2.534** (.298)	2.515** (.300)
Years of education	-.054** (.017)	-.047** (.019)	-.077** (.013)	-.076** (.013)
Excellent	-.467 (.310)	.188 (.869)	-1.203** (.274)	-1.158** (.446)
Very good	-.603** (.284)	-.035 (.760)	-1.091** (.257)	-1.056** (.372)
Good	-.292 (.245)	.139 (.592)	-.897** (.237)	-.872** (.302)
Fair	-.090 (.250)	.135 (.385)	-.672** (.238)	-.661** (.247)
Health limits activities	.791** (.156)	.688** (.204)	.396** (.109)	.389** (.115)
Number of children	-.107** (.043)	-.075 (.059)	.051 (.036)	.051 (.037)
Germany	-.848** (.250)	-.827** (.262)	-.742** (.177)	-.738** (.178)
Sweden	-1.046** (.247)	-1.026** (.258)	-1.278** (.178)	-1.263** (.193)
The Netherlands	-.771** (.263)	-.662** (.308)	-.577** (.187)	-.566** (.198)
Spain	-.893** (.294)	-.788** (.335)	-1.387** (.210)	-1.362** (.268)
Italy	-.715** (.273)	-.551 (.347)	-.554** (.202)	-.541** (.224)
France	-.673** (.286)	-.566* (.324)	-1.154** (.189)	-1.145** (.190)
Denmark	-.734** (.248)	-.676** (.270)	-.884** (.197)	-.877** (.199)
Greece	-1.397** (.287)	-1.358** (.303)	-.140 (.175)	-.143 (.177)
Switzerland	-1.270** (.328)	-1.101** (.392)	-.692** (.216)	-.679** (.235)
P-value of Wald test of exogeneity	.3653		.9464	
Proportion retired	.375		.519	
Number of observations	682		1,230	

NOTE: Standard errors in parentheses.
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

Table 11 Retirements Probit Estimation, Couples

	Men		Women	
	(1)	(2)	(3)	(4)
	Probit	IV Probit	Probit	IV Probit
Survival probability to 75	-.115 (.102)	-.979 (1.026)	-.307** (.093)	-.296 (.783)
Age 51	-.414** (.190)	-.416** (.191)	.144 (.115)	.142 (.115)
Age 52	-.346* (.185)	-.338* (.187)	.035 (.118)	.034 (.119)
Age 53	-.122 (.182)	-.082 (.190)	.048 (.115)	.047 (.116)
Age 54	.078 (.164)	.113 (.171)	.237** (.118)	.234** (.119)
Age 55	.262 (.166)	.284* (.170)	.315** (.113)	.312** (.114)
Age 56	.288* (.160)	.317* (.166)	.409** (.113)	.406** (.113)
Age 57	.597** (.154)	.620** (.159)	.423** (.113)	.420** (.113)
Age 58	.593** (.156)	.618** (.161)	.519** (.116)	.516** (.118)
Age 59	.861** (.156)	.905** (.168)	.689** (.120)	.685** (.121)
Age 60	1.330** (.149)	1.382** (.165)	1.031** (.119)	1.026** (.120)
Age 61	1.771** (.155)	1.829** (.173)	1.368** (.128)	1.362** (.130)
Age 62	1.769** (.152)	1.795** (.158)	1.368** (.131)	1.362** (.134)
Age 63	2.053** (.158)	2.122** (.182)	1.702** (.139)	1.697** (.139)
Age 64	2.158** (.157)	2.207** (.171)	1.828** (.146)	1.822** (.147)
Age 65	2.854** (.174)	2.900** (.186)	2.711** (.203)	2.704** (.204)
Years of education	-.028** (.007)	-.026** (.007)	-.061** (.007)	-.061** (.007)
Excellent	-1.386** (.163)	-1.127** (.345)	-.750** (.144)	-.750** (.254)
Very good	-1.413** (.153)	-1.196** (.298)	-.609** (.134)	-.610** (.224)
Good	-1.298** (.146)	-1.126** (.248)	-.897** (.128)	-.558** (.194)
Fair	-.906** (.146)	-.825** (.174)	-.228* (.130)	-.228 (.152)
Health limits activities	.328** (.062)	.321** (.063)	.145** (.053)	.145** (.054)
Number of children	-.030 (.020)	-.029 (.021)	.043** (.018)	.043** (.019)
Germany	-.781** (.107)	-.737** (.119)	-.694** (.101)	-.692** (.104)
Sweden	-1.104** (.109)	-1.073** (.116)	-1.448** (.102)	-1.445** (.110)
The Netherlands	-.544** (.104)	-.488** (.123)	-.296** (.097)	-.296** (.114)
Spain	-.844** (.125)	-.747** (.168)	-.406** (.112)	-.407** (.143)
Italy	-.117** (.110)	-.019 (.160)	-.070 (.107)	-.070 (.118)
France	-.103** (.125)	-.039 (.147)	-.842** (.118)	-.840** (.126)
Denmark	-.755** (.125)	-.701** (.140)	-.969** (.118)	-.967** (.144)
Greece	-.396** (.112)	-.375** (.116)	.162 (.114)	.162 (.114)
Switzerland	-1.013** (.153)	-.980** (.159)	-.879** (.135)	-.877** (.141)
P-value of Wald test of exogeneity	.3972		.9877	
Proportion retired	.356		.568	
Number of observations	4,241		4,553	

NOTE: Standard errors in parentheses.
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

Table 12 Wealth Regression Results, Single Households

Dependent variable: Household wealth (in €1,000s)

	(1) OLS	(2) IV
Survival probability to 75	49.59 (92.60)	1001.32 (1910.92)
Age	-9.62 (102.10)	-31.39 (141.31)
Age squared	.09 (.87)	.27 (1.20)
Female	-22.38 (54.23)	-66.30 (119.55)
Years of education	11.06* (5.79)	7.51 (6.67)
Excellent	58.20 (86.18)	-228.72 (574.67)
Very good	27.16 (88.02)	-205.15 (483.99)
Good	56.95 (73.65)	-116.84 (302.72)
Fair	-13.21 (74.55)	-102.88 (216.58)
Health limits work	-53.24 (46.30)	-18.25 (61.43)
Number of children	-.18 (24.33)	-6.63 (34.96)
Germany	-16.27 (47.51)	-26.30 (67.65)
Sweden	-19.95 (37.23)	-56.37 (81.34)
The Netherlands	166.88 (119.42)	113.39 (145.10)
Spain	116.50 (106.80)	20.42 (230.28)
Italy	235.88 (402.74)	160.81 (284.36)
France	69.76 (44.20)	51.99 (74.69)
Denmark	-76.56 (29.76)	-94.30 (55.93)
Greece	12.65 (28.64)	14.37 (42.10)
Switzerland	81.06 (86.88)	11.80 (174.12)
Constant	216.66 (2932.25)	516.50 (3613.95)
P-value of Durbin-Wu-Hausman test of endogeneity	.606	
Number of observations	1,912	

NOTE: Standard errors in parentheses.
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

Table 13 Wealth Regression Results, Couple Households

Dependent variable: Household wealth (in €1,000s)

	(1) OLS	(2) IV
Survival probability to 75	93.84* (55.74)	726.95 (616.40)
Age	159.49 (116.16)	144.14 (118.56)
Age squared	-1.36 (1.02)	-1.24 (1.04)
Female	-11.36 (37.96)	-22.78 (35.37)
Years of education	14.17** (5.99)	12.71** (5.93)
Excellent	115.12 (116.08)	-65.79 (210.46)
Very good	51.00 (115.43)	-103.18 (187.26)
Good	47.89 (109.41)	-75.00 (167.91)
Fair	-67.81 (108.34)	-129.88 (125.73)
Health limits work	18.81 (35.61)	24.46 (37.42)
Number of children	4.58 (23.37)	4.97 (23.49)
Germany	24.40 (35.51)	-1.25 (43.52)
Sweden	-36.74 (30.23)	-64.80 (41.26)
The Netherlands	167.54** (65.02)	122.80 (81.01)
Spain	445.52** (124.88)	373.78** (131.81)
Italy	323.80** (124.57)	269.66** (129.40)
France	297.94** (117.65)	256.69* (135.07)
Denmark	39.68 (53.00)	-13.27 (80.40)
Greece	23.92 (28.68)	16.72 (30.13)
Switzerland	210.92** (69.58)	181.70** (70.83)
Constant	-4651.09 (3286.99)	-4429.54 (3320.50)
P-value of Durbin-Wu-Hausman test of endogeneity	.302	
Number of observations	8,794	

NOTE: Standard errors in parentheses
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

Table 14 Retirements Probit Estimation, Singles

	Men		Women	
	(1)	(2)	(3)	(4)
	Probit	IV Probit	Probit	IV Probit
Survival probability to 75	-.001 (.003)	-.006 (.021)	-.003 (.002)	-.008 (.014)
Age 51	-.666 (.590)	-.673 (.609)	-.084 (.428)	-.155 (.464)
Age 52	-.275 (.565)	-.269 (.581)	-.288 (.430)	-.275 (.432)
Age 53	-.687 (.586)	-.630 (.634)	-.327 (.426)	-.325 (.426)
Age 54	.039 (.567)	.071 (.600)	-.516 (.430)	-.517 (.433)
Age 55	-.589 (.562)	-.557 (.592)	-.180 (.416)	-.209 (.426)
Age 56	.162 (.563)	.176 (.484)	.078 (.425)	.011 (.460)
Age 57	.035 (.575)	.102 (.658)	.154 (.439)	.111 (.451)
Age 58	.028 (.583)	.077 (.637)	.339 (.418)	.271 (.455)
Age 59	.127 (.566)	.166 (.612)	.807* (.449)	.765* (.459)
Age 60	.780 (.593)	.862 (.711)	.870** (.436)	.834* (.445)
Age 61	-.380 (.609)	-.325 (.660)	1.322** (.455)	1.283** (.465)
Age 62	.644 (.563)	.680 (.608)	1.117** (.418)	1.089** (.418)
Age 63	.596 (.575)	.630 (.613)	1.532** (.435)	1.491** (.436)
Age 64	1.292** (.583)	1.274** (.600)	1.436** (.439)	1.399** (.445)
Age 65	2.223** (.640)	2.192** (.654)	1.891** (.444)	1.841** (.451)
Foreign/other	.028 (.349)	-.058 (.481)	-.058 (.200)	-.033 (.209)
NVQ level 1	.050 (.344)	.055 (.352)	.009 (.501)	-.045 (.523)
NVQ level 2	.125 (.217)	.165 (.284)	-.194 (.155)	-.196 (.159)
NVQ level 3	-.051 (.269)	-.014 (.321)	-.355 (.234)	-.331 (.241)
Higher ed below degree	-.284 (.262)	-.243 (.302)	.298 (.206)	.298 (.210)
NVQ levels 4 or 5	-.484* (.252)	-.479* (.259)	-.191 (.198)	-.167 (.204)
Excellent	-1.149** (.381)	-.981 (.695)	-1.219** (.319)	-1.069** (.483)
Very good	-1.381** (.345)	-1.251** (.550)	-1.057** (.287)	-.931** (.415)
Good	-1.612** (.333)	-1.493** (.450)	-.582** (.267)	-.510 (.333)
Fair	-1.050** (.328)	-.969** (.423)	-.654** (.255)	-.608** (.283)
Health limits activities	.982** (.189)	.940** (.220)	.873** (.151)	.849** (.155)
Number of children	-.117** (.050)	-.119** (.052)	.087** (.039)	.084** (.040)
P-value of Wald test of exogeneity	.7914		.6565	
Proportion retired	.446		.487	
Number of observations	428		712	

NOTE: Standard errors in parentheses.
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

Table 15 Retirements Probit Estimation, Couples

	Men		Women	
	(1) Probit	(2) IV Probit	(3) Probit	(4) IV Probit
Survival probability to 75	-.0004 (.001)	-.008 (.008)	-.001 (.001)	.010 (.007)
Age 51	-.051 (.247)	-.040 (.248)	.305* (.169)	.303* (.171)
Age 52	-.015 (.234)	.002 (.235)	.432** (.175)	.426** (.177)
Age 53	-.127 (.241)	-.128 (.242)	.141 (.173)	.152 (.175)
Age 54	.150 (.228)	.161 (.228)	.376** (.164)	.380** (.167)
Age 55	.108 (.225)	.089 (.226)	.560** (.163)	.528** (.166)
Age 56	.519** (.220)	.541** (.221)	.499** (.173)	.474** (.176)
Age 57	.417* (.230)	.449* (.232)	.673** (.170)	.664** (.173)
Age 58	.631** (.223)	.651** (.224)	.830** (.170)	.823** (.172)
Age 59	.711** (.224)	.716** (.224)	.907** (.175)	.881** (.178)
Age 60	1.262** (.224)	1.298** (.228)	1.263** (.173)	1.230** (.177)
Age 61	1.148** (.224)	1.173** (.226)	1.826** (.192)	1.767** (.198)
Age 62	1.023** (.229)	1.052** (.232)	1.814** (.205)	1.793** (.208)
Age 63	1.445** (.227)	1.471** (.229)	1.826** (.197)	1.835** (.200)
Age 64	1.508** (.224)	1.538** (.227)	2.153** (.215)	2.148** (.217)
Age 65	2.527** (.243)	2.559** (.246)	2.649** (.251)	2.595** (.256)
Foreign/other	.188 (.172)	.224 (.178)	-.283** (.102)	-.281** (.103)
NVQ level 1	-.057 (.144)	-.048 (.145)	-.486** (.188)	-.524** (.192)
NVQ level 2	.125 (.103)	.156 (.108)	-.109 (.079)	-.148* (.083)
NVQ level 3	.193 (.131)	.226* (.136)	-.347** (.128)	-.406** (.135)
Higher ed below degree	.128 (.105)	.164 (.112)	-.182* (.101)	-.218** (.105)
NVQ levels 4 or 5	.278** (.102)	.314** (.109)	-.414** (.105)	-.476** (.113)
Excellent	-1.306** (.182)	-1.091** (.279)	-1.183** (.210)	-1.407** (.254)
Very good	-1.374** (.171)	-1.191** (.246)	-1.133** (.201)	-1.308** (.230)
Good	-1.354** (.164)	-1.220** (.210)	-1.084** (.197)	-1.201** (.212)
Fair	-.987** (.162)	-.910** (.179)	-.905** (.201)	-.997** (.211)
Health limits activities	.721** (.085)	.710** (.086)	.496** (.079)	.497** (.080)
Number of children	.011 (.023)	.007 (.023)	-.040* (.021)	-.041* (.021)
P-value of Wald test of exogeneity	.3060		.1004	
Proportion retired	.314		.483	
Number of observations	2,210		2,333	

NOTE: Standard errors in parentheses.
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

Table 16 Wealth Regression Results, Single Households

Dependent variable: Household wealth (in £1,000s)

	(1) OLS	(2) IV
Survival probability to 75	.27 (.26)	7.78** (3.80)
Age	30.92 (54.15)	1.81 (71.38)
Age squared	-.24 (.45)	-.01 (.60)
Female	-14.13 (24.76)	-49.63 (40.15)
Foreign/other	65.48** (15.93)	82.88** (29.22)
NVQ level 1	-13.57 (17.23)	-13.07 (42.18)
NVQ level 2	79.18** (17.57)	64.96** (24.92)
NVQ level 3	188.41** (85.20)	146.69** (73.46)
Higher ed below degree	110.30** (29.21)	93.26** (35.66)
NVQ levels 4 or 5	128.05** (18.37)	122.33** (24.20)
Excellent	40.28 (32.65)	-162.25 (124.25)
Very good	61.86** (26.09)	-93.57 (95.64)
Good	46.99** (18.43)	-71.73 (58.65)
Fair	15.78 (12.78)	-51.34 (47.92)
Health limits activities	-40.79* (22.41)	-22.99 (22.63)
Number of children	-5.30 (5.45)	-1.54 (7.75)
Constant	-918.42 (1610.65)	-368.72 (2031.52)
P-value of Durbin-Wu-Hausman test of endogeneity	.0212	
Number of observations	1,140	

NOTE: Standard errors in parentheses.
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.

Table 17 Wealth Regression Results, Couple Households

Dependent variable: Household wealth (in £1,000s)

	(1) OLS	(2) IV
Survival probability to 75	.28 (.25)	3.74** (1.43)
Age	156.00** (45.33)	156.25** (46.13)
Age squared	-1.30** (.39)	-1.31** (.40)
Female	37.80** (8.97)	23.27** (11.30)
Foreign/other	52.13** (14.71)	48.14** (15.97)
NVQ level 1	21.50* (13.01)	14.74 (14.69)
NVQ level 2	118.72** (18.27)	105.29** (18.52)
NVQ level 3	163.92** (28.42)	146.42** (29.34)
Higher ed below degree	120.63** (13.24)	106.43** (14.88)
NVQ levels 4 or 5	309.40** (39.49)	291.05** (41.29)
Excellent	162.61** (32.75)	74.76* (43.46)
Very good	109.75** (23.26)	37.34 (40.89)
Good	51.46** (18.03)	-.77 (28.76)
Fair	7.30 (13.60)	-26.87 (21.05)
Health limits activities	-13.29 (14.40)	-11.45 (14.88)
Number of children	-17.90** (5.53)	-17.30** (5.59)
Constant	-4565.92 (1307.62)	-4702.12 (1323.72)
P-value of Durbin-Wu-Hausman test of endogeneity	.0082	
Number of observations	4,543	

NOTE: Standard errors in parentheses
* Statistically significant at the .10 level. ** Statistically significant at the .05 level.