Micro Determinants of Labor Force Status Among Older Americans[†]

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Abstract

This paper uses the first three waves of the Health and Retirement Survey (HRS) to investigate the determinants of labor force status among older Americans. Using transitions at two-year intervals we find that after being retired or unemployed, those who are actively searching for a job have a higher probability of returning to work. We also find that being in good physical and mental health—measured by objective and subjective variables—increases the chances of becoming employed, as does having worked in the last twelve months. Those who are receiving disability payments are less likely to make this transition. If we focus on those who are married, we find a preference for joint leisure through the influence of the labor force status, health and age of the respondent's partner on the transition decisions. We investigate transitions in and out of employment and self-employment, and for subsamples of males and females. Using monthly employment dummies for the period 1989-97, we analyze monthly, quarterly, semi-annual and annual transitions and find that most of our conclusions are independent of the periodicity but that the effects of the variables vary across specifications.

Keywords: Labor Supply, Labor Force Transitions, Retirement Decision, Health and Retirement Survey.

JEL classification: J14, J2

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1 Introduction

This paper presents an empirical analysis of the determinants of labor force status in the Health and Retirement Study (HRS). The HRS is a large, longitudinal survey that follows a cohort, ages 51 to 61 as of 1992/93, and their spouses, from pre-retirement into retirement. It is specially designed to track the labor market behavior of older Americans and their health status.

Labor force transitions have been the object of a considerable number of studies, and they will continue to be as better data sets become available and interest increases in the evolution of the labor market behavior of older workers, in large part due to its policy implications in the current debate on the future and the reform of the American Pension and Social Security Systems.

A significant number of studies have used the Retirement and History Survey (RHS) as the basis for their empirical work. The RHS is a longitudinal survey of men and single women ages 58 to 63 as of 1969 that followed respondents up to 1979. Rust (1990), Blau (1994) and Rust and Phelan (1997) focus on males, Blau (1997 and 1998) studies married couples and Pozzebon and Mitchell (1989) restrict their attention to married women. Peracchi and Welch (1994) use the Current Population Survey (CPS) to study labor force transitions of males and females from 1968 to 1991, and Hurd (1990a) uses the New Beneficiary Survey (NBS) to analyze the joint retirement decision of husbands and wives.

The availability of the HRS has fostered a new wave of empirical work in this area, responding to the need to update the sources of data in a time of change in policy and attitude towards the importance of the labor market behavior of older Americans. Also, the fact that a majority of HRS respondents are females has allowed some researchers to incorporate the analysis of labor market behavior of older women into their research. Hurd and McGarry (1993), Gustman, Mitchell, and Steinmeier (1995), Blau and Gilleskie (1997), Blau, Gilleskie, and Slusher (1997), Friedberg (1997), Karoly and Rogowski (1997), Rogowski and Karoly (1997), Quinn (1998), Coile (1999), Costa (1999), and Coile and Gruber (1999) are examples of this research. Quinn (1998) is the only study that uses the three available waves of the HRS as we do in this paper, but concentrates only on those employed as of the first wave of interviews. Blau and Riphahn (1998) use the German Socioeconomic Panel to study married couples in Germany, and it is the only other study along with this one that makes use of monthly employment indicators.[1]

This paper contributes to the literature in several ways:

- This is one of the first papers to use all three waves of the HRS to analyze the latest evidence on trends

[1] Hurd (1990b), Lumsdaine (1995), Lumsdaine and Mitchell (1998), and Currie and Madrian (1998) are excellent surveys of the literature on retirement behavior and related issues.

in retirement and labor supply among the American elderly.

- This is the first panel study, using American data, to track employment down to the monthly level.
- The use of a wide range of health, demographic and socio-economic variables provides a more detailed and updated picture of the micro determinants of labor force transitions.
- This paper takes a closer look at those making a reverse transition decision, to explore more in depth than previous literature their characteristics and labor force decisions. The Economics of Aging has focused much more on the retirement decision but changes in demographic and socio-economic trends (higher longevity, improvements in health outcomes, technological progress that can change the nature of work, etc.) justify that we take a closer look at the important variables behind the decisions of coming back to work after a job displacement spell or retirement.
- This is one of the first papers that analyzes married people separately using the HRS, allowing for some of the spouse's variables to have an effect on the respondents' decisions.

Some aggregate variables seem to show that in the last two or three years, as the economy has grown steadily and unemployment rates have gone down without triggering inflation, older Americans out of the labor market are finding it easier to return if they so choose.[2]

Figures 1 and 2 show the evolution of the labor force participation rate among males and females ages 55 to 64, from January 1988 to August 2000 based on monthly data from the Bureau of Labor Statistics (BLS). For both groups, we can see an increase in this rate in the last 3 or 4 years that is sharper for women, confirming a historical trend, but it is also present for men, implying a reversal in a trend that started decades ago. This has to be considered along with decreasing unemployment rates among the same population. We can conclude that people in these age range who want to work, have a position almost assured, given the current economic conditions.[3] For those 65 and over the participation rates are much lower and more stable in the last 10 years, but as has been noticed recently in the media, there is some evidence based on BLS data of a change in the trend in the last years for this age group as well.[4]

[2] The literature has already referred to the possibility of this trend. Hurd (1990b, p.631) considers the overall rationality behind a possible increase in labor force participation of the elderly: "I can well imagine that as the labor pool of younger workers shrinks, employment opportunities for older workers will expand, and that many will increase their work lives in response to the better jobs." Schulz (1995, p.282) argues that: "Without dramatic changes in the ability of countries to moderate business cycles and keep unemployment low over the long run, there may be little change in current provisions that encourage retirement and early retirement." Ruhm (1996, p.100) argues that: "...changes in the Social Security System will encourage longer work lives as benefits become less generous for future retirees, the age of "normal" retirement is raised, and the penalty for early retirement is increased."

[3] Ruhm (1996) mentions the possibility that official unemployment statistics understate the labor market problems of older workers, who are more likely to be discouraged and drop out of the workforce.

[4] "The New Faces of Retirement". The New York Times, January 3, 1999.

How can we explain this change in trend? One possible explanation is that the Social Security amendments of 1983 and other more recent efforts to make work more appealing at the end of the life cycle are having an impact on behavior among the elderly. This can also happen as an indirect result of the change in attitude towards work as Americans reach the retirement age in better health and with longer life expectancies, and as firms see their workforces aging as the baby boomers grow older. An alternative would be to argue that this is a temporary phenomenon due to the tight labor market and the economic expansion that has forced firms to resort to less traditional sources of workers, including the elderly.[5] We can complement this last explanation with the fact that the current technological revolution can help make work more accessible to older workers. Self-employment, part-time work using the internet, and telecommuting are just some examples of the radical changes in the concept of employment that we will see in the future, changes that could favor the increase in employment among older Americans.

This paper can not fully address these issues, but with them in mind, we are able to shed light on whether the micro determinants of labor force status among the American elderly have changed in the last decade. The change in trend observed in Figure 1 justifies our interest in learning more about what affects labor market decisions now that we have access to very rich data on this population. The reduced form nature of our analysis makes it an exploratory effort contributing to the understanding of labor force transitions of this population with a richer and updated data set.

Our empirical results show that among the non-employed, those who have health insurance are less likely to return to work, revealing a "spike" at age 62 and a 65+ effect, especially among men.[6] Among the employed, those with access to retiree health insurance are more likely to leave the workforce, with the age effects peaking at age 63-64.[7] These results are consistent with Blau and Gilleskie (1997) who use the same data set but restrict attention to male respondents in the first two waves of the survey, and use a somewhat controversial characterization of the transition periods; and with Karoly and Rogowski (1997) that concentrate on men and only on the retirement decision. The results can also be reconciled with those of Rust and Phelan (1997), limited by the fact that they build a structural model incorporating the Social Security incentives, an approach beyond the scope of this study.

Our results on the effects of health status are fairly standard; that is, those with health problems are less

[5] The National Council on Aging launched during 1998 the "100,000 jobs Campaign" that aims at placing that many workers age 50 or older during the next five years. Many major American employers are participants in the campaign. This can help make this increase in demand a less temporary one.

[6] We have grouped here those respondents age 65 with those over 65 because of the small number of respondents in either group. We can interpret this 65+ effect as reflecting the fact that individuals start receiving S.S. benefits and become eligible for public health insurance through Medicare after reaching age 65.

[7] These effects probably include the influence of the COBRA legislation that requires firms of a certain size to provide continuation of health benefits for a maximum period of 18 months once employees leave the firm.

likely to return to work and more likely to leave work. We use a wide variety of objective and subjectives measures, measures of activities of daily living (ADLs), instrumental activities of daily living (IADLs), and cognition variables. The effect of marriage is also consistent with the results of Blau (1994) and Peracchi and Welch (1994), showing significant differences between males and females. Married men are more likely to return to work and less likely to leave the workforce, while the opposite is true for married women. We find that education variables have a small effect and are rarely significant in the transition decisions. This differs from the results of Peracchi and Welch (1994), but is consistent with the small effects found by Blau (1994). This is not surprising since we are controlling for a larger array of variables in which education is left with almost no explanatory power.

An important and original result is the relevance of the job search behavior of the respondent in the re-entry decision. Those who were searching for a job in the month prior to the interview were much more likely to be successful. This result contrasts with Rust (1990), who did not find a significant effect of the searching decision on the probability of finding a job afterwards. We will show that this result is not merely spurious and test the exogeneity of this variable in our sample of non-employed respondents.

We also analyze married people separately and find that the influence of the spouse's labor status, age and health on the respondents' decisions can be interpreted either as a complementarity of time effect, or for those non-employed, as a preference for joint leisure. This result is consistent with Pozzebon and Mitchell (1989), Hurd (1990a), Blau (1998), and Blau and Riphahn (1998).

An important contribution of this paper is the estimation of short transitions using monthly employment dummies. We calculate monthly, quarterly, semi-annual and annual transitions in addition to the more common survey to survey transitions. This gives us a sense of some of the dynamic effects of the explanatory variables and can be interpreted as a test of our results using the traditional biennial transitions. Most of the significant variables have stronger effects for the shorter transitions, implying that the estimates using longer time periods could represent a lower bound for the true effect of some variables.

In the next section we present the data used in this study and discuss its limitations and potential problems, as well as its strengths for the purposes of our research. In section three we present and analyze the empirical results. Section four concludes and offers some suggestions for further research.

2 Data and Summary Statistics

The data used in this paper is from the Health and Retirement Study (HRS). The HRS is a nationally representative longitudinal survey of 7,700 households headed by an individual ages 51 to 61 as of wave 1. 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.[8] Up to now data of the first four waves of the survey are available, and in this paper we will consider the first three. We work with 12,652 respondents from wave 1 of the data collected in 1992 and 1993, 11,596 respondents from wave 2 collected mainly in 1994, and 10,970 respondents from wave 3, collected during 1996 and January of 1997. The last two waves were conducted by phone using the computer assisted technology (CATI) which allows for much better control of the skip patterns and reduces recall errors.

Death and attrition have reduced the number of participants in the survey. This can create some selectivity issues that we assume away in our estimations. Additional individuals, who have been included, have entered the survey later on mainly as spouses of previous respondents. We will restrict our attention to those age 50 and over given the objectives of this paper. The variables used in this study are the result of several programs that calculate the hours of work, earnings, employment history, wealth, income, health status and several other relevant variables for the respondent of the three waves. The hardest task has been to construct the employment histories of the respondents. Fortunately, the survey was designed with this in mind, but the complexity of the skip pattern and the multiplicity of different employment histories over the three waves has made our work a time consuming one. In the employment histories of the respondents we define three states:

- *Employed:* works for someone else and receives a salary or wage. In general, this category has the highest proportion of respondents.

- *Self-employed:* works for him/herself receiving a salary, profits or even nothing. The separate analysis of these respondents is fairly new in the literature. We have decided to differentiate them from those employed for a third party because those who are self-employed have fairly different characteristics from those working for a company, as shown below, and we conjectured that this could result in obscuring some of the estimation results.[9]

- *Non-employed:* does not do any work for pay. We include in this category people who are out of the labor force, in the sense that they are not necessarily looking for a job.[10]

[8] See Juster and Suzman (1995), also Gustman, Mitchell and Steinmeier (1994 and 1995) or the HRS web page.

[9] We will see in the next section that some variables have different effects for employed and self-employed individuals, justifying the splitting of the sample. Also the empirical transition probabilities from one employment state to another show different patterns for employees and self-employed individuals.

[10] This labor force status is comparable to the one used in the literature. However, Peracchi and Welch (1994) include in this

We have flagged the respondents appropriately to know their trajectories up to wave 3 or their last survey interview. Although we use the three waves of data, we only have two decision making periods. Our data will assume that the respondents make labor force decisions at each interview, given their status and characteristics at that time. The results of these decisions can then be measured in the next interview. We can identify this approximately two-year period as a problem, since a respondent's status in the next wave is somehow a result of his decisions and characteristics two years ago, but it also depends on many other events that have occurred in the meantime. To avoid this problem we have also run monthly, quarterly, semi-annual and annual transitions from the date of the interview. We will present the results and we will compare them with the survey to survey transitions.

The data for the respondents were merged from wave 3 backwards to waves 2 and 1, and we constructed a set of consistent variables on different sources of income, wealth, health and socio-economic characteristics that were assigned to each decision maker appropriately. We work with a sample of more than 20,000 person/period observations. We assume that each individual makes at most one decision in wave 1 and one in wave 2. Therefore, each respondent can have a maximum of two decisions, depending on whether we have been able to follow him or her through the subsequent waves.

For our estimation purposes we have broken down this sample into sub-samples. For example, the sub-sample of those non-employed in any of the two waves has 7,117 observations, that of the self-employed has 2,393 observations and that of the employed 10,259 observations. We divided our sub-samples further, constructing smaller data sets for males and females for each sub-sample. This allows us to analyze separately males and females to uncover relevant differences and similarities. It is interesting to emphasize that females outnumbered males in the samples of non-employed and employed, and men were more numerous among the self-employed. We also create sub-samples of married respondents to analyze that population separately. Table 1, panels *A* to *C* offer means and standard deviations of most of the variables used for the three main sub-samples.

The sample of non-employed compared with the whole sample has respondents with lower educational level, lower family and personal income levels in the year before the interview, a higher proportion of them receives Health Insurance coverage from the government, and a lower proportion from past employers or their's spouses employers. They are in worse health by any measure, and they have worked much less during the year prior to the interview. If we concentrate on the reverse transitioners (not shown) we see that they are younger, they have higher income levels, and fewer of them receive disability payments or consider

category only those out of the labor force, and include those unemployed in the full-time and part-time category depending on their searching decision. This allows them to introduce a variable that controls for unemployment status.

themselves retired. A much higher proportion of those that return to work was searching for a job in the month before the interview, and a higher proportion left their last job because they quit or were fired. They are also in better health than the average non-employed.

The sub-sample of self-employed is white, male, married, and more educated than the whole sample. They have higher income and wealth levels. They worked more in the year before the interview and they are in better health. Among the sub-sample of employed, it is worth concentrating on the transitioners to non-employment (not shown) who tend to be older, in worse health, with lower income levels and a lower proportion of them expect to work after reaching age 62.

3 Estimation Results

In this section we first present empirical transition probabilities to compare labor force status of the respondents in different periods. We then report the multinomial logit estimates of the survey to survey transitions out of the different labor force status and also the binomial logit results of the shorter transitions. We will present only our preferred specifications and only summary tables of the shorter transitions, but other specifications and the binomial logits are available upon request.

3.1 *Empirical Transition Probabilities*

The transition probability for movement from state A to state B is the number of respondents that moved from the first state to the second between the two periods of analysis divided by the total number in state A in the first period. Here we are only considering those respondents that appear in both waves. In our sample we can look at transition probabilities from wave 1 to wave 2 and from wave 2 to wave 3. In Table 2 we show these matrices for transitions between survey waves.

From Table 2 the first important issue to consider is that coming back to work is fairly common among this population there is, regardless of the sample and period, more than 11% probability that if a person is non-employed in the previous wave he/she will have a job in the next wave, with a much higher probability for transitions into employment than into self-employment.

Panels *A* and *B* show the empirical transition probabilities for men and women, respectively, from wave 1 to wave 2. Panels *C* and *D* show the same for transitions between wave 2 and wave 3. The comparison across periods reveals very similar transitions probabilities, with a slightly higher probability of becoming employed after the second wave for men.

Comparing panels *A* and *B* we see that the probability for self-employed women of becoming non-

employed is clearly larger than for men who have a much higher probability of keep working at their businesses. The situation reverses when it comes to leave employment: women have a higher probability of keeping their jobs and a lower probability of becoming self-employed. Again, this difference pattern justifies having splitted the sample between employees and self-employed respondents. The probabilities out of non-employment are quite similar, with slightly higher probability for women of staying out of work.

Comparing panels *C* and *D* we can see again that females had a much higher probability of leaving work if they were self-employed—the probability increases 12 percentage points, a very significant difference. On the other hand, in the case of transitions out of employment, women have transition probabilities very similar to those of men. The higher persistence of non-employment among women is maintained in these panels.

Another interesting result that is true both for men and women is that it is more likely to become self-employed if you were non-employed in the previous interview than if you were and employee, suggesting that being out of work might foster, other things equal and comparatively to being and employee, that individuals decide to set up their own business.

3.2 *Transitions from non-employment to self-employment and employment*

We present here the estimation results for the non-employed, trying to uncover the important variables affecting the decision to return to work either as employee or as self-employed. This is the specification that we will consider more in detail as being the one less studied in the literature.

Table 3 presents the regression coefficients of the Multinomial logit model using Maximum Likelihood for the transitions from non-employment to self-employment and employment, and their standard errors adjusting for heterocedasticity (White's SE). The base case is remaining non-employed. We also include at the bottom of each column the average log likelihood and the number of observations for that specification. This table has six sets of results since we report three different specifications, and the coefficients for the two transition choices are included. The first section of the table refers to the transitions from non-employment to self-employment, and the second refers to the transitions to employment.

We include many independent variables, up to 34, obtaining a good fit. A high proportion of them are significant, the majority at the 5% level or better. We have included age range dummies to capture the different age effects (including dummies for ages 62 and 65+ to capture the early retirement "spike" that have been studied in the literature and the S.S. and Medicare effect for those 65 years of age or older), and the ones presented are with respect to the dummy for those under 55. We have also included interaction terms between the age dummies and a dummy that takes the value 1 if respondents have health insurance from a past

employer or their spouse's employer. Here we can see that being 62 or 65 and insured clearly decreases the probability of making a reverse transition, especially into employment. We also include a dummy that takes the value 1 if the respondents have government health insurance coverage, this decreases the probability of making a transition, especially into self-employment, as a matter of fact it is not significant for the transitions to employment, supporting our idea that the determinants of the transitions to self-employment and employment can be different.

There are relatively few respondents in the 62 to 65 age range among the reverse transitioners, around 20% of the spells back to work come from these respondents, but considering that around 16% of our sample is in that age range indicates some unconditional propensity among this group. Most of them have access to retiree health insurance as well. Based on analyzing the characteristics of the transitioners (not on the estimation results) those that return at 65 or over tend to be married and male in a lower proportion with respect to those that stay non-employed in the same age range, but in general are older than their spouses, 13 years older versus 11 for the non-transitioners, and receive retiree health insurance (especially health insurance paid by the employer) and government health insurance in a lower proportion. Those that return to work at age 62 tend to be male, married and white in a higher proportion than non-transitioners at the same age. They also tend to be older than their spouses by around 2 years, compare with around 9 months for those that stay non-employed. The biggest difference between transitioners and non-transitioners of age 62 is that those that change labor force status receive health insurance from the government in a much lower proportion. Only around 5% of transitioners receive this kind of insurance versus about 30% of the non-transitioners.

The analysis of the effects of health insurance on labor force decisions of the elderly is an important issue, and our results are consistent with those of Blau and Gilleskie (1997) who also use the HRS but only the first two waves of the survey and concentrate only on males age 51 to 61 as of wave 1. Our results are also consistent with Rust and Phelan (1997) who identify a group of "health insurance constrained" individuals that need to wait until they have access to government health insurance to retire. Those individuals seem also less likely to return to work.[11]

A dummy variable that is 1 if the decision is made in wave 2 is negatively related to the decision of changing labor force status, meaning that deciding in the second wave, 1994/95, implies a lower probability of returning to work, proxying for some business cycle effect. However, this dummy is only significant for the transitions to self-employment and only for women.

[11] For a review of the literature on the effects of health insurance on the labor market outcomes of older people see Currie and Madrian (1998) and the discussion in Lumsdaine (1995).

On the other hand, the effect of marriage is consistent with Blau (1994) and Peracchi and Welch (1994).[12] Married men are more likely to return to work as employees but married women have a lower probability of making this transition. This might be reflecting the traditional role of women in the household among this population. This effect does not appear in the transitions to self-employment.

Another very important variable in this estimation, and in fact across all specifications, is `Searchj`, a dummy that takes the value 1 for those who were searching for a job during the month before the interview. The coefficient is very large and significant for the transitions to employment, meaning that the probability of returning to work increases sharply if the individual is actually searching for a job. In the transitions to self-employment the variable is less important, and only significant for males. This is plausible if we believe that establishing one's own business is a decision that depends less on one's willingness to search for a job. This fact also reinforces our decision to split the sample of working respondents into employees and self-employed individuals.

This result might seem obvious, after all if a person is not searching for a job the chances of finding one are very slim. However, we have to consider that this variable can be making the distinction between unemployed and out of the labor force individuals, and also for the business cycle effect, in the sense that if a person is searching and the economy is doing relatively well, the chances of actually finding a job increase sharply. Unemployment rates are at record lows among this population, which means that almost anyone who wants to work finds a job. This contrasts in an interesting way with the developments in Europe where given the current economic conditions, we conjecture that a search variable of the type used here would have a much smaller effect.

As can be seen from the table, this variable is very robust across samples and specifications and therefore it is a very good predictor of the decisions to return to work, even after controlling for a wide range of variables. We interpret our finding of the importance of the search variable among this population as a confirmation of the main result in Flinn and Heckman (1983), that is, that unemployment and out of the labor force are behaviorally distinct labor force states. They obtain this result using a small data set of young men. We find that the distinction between these two states is also meaningful for older individuals, in the sense that the search decision (the variable that we choose to ultimately distinguish between these two states) has an large effect on the probability of finding a job. This result is somewhat different from the results reported by Rust (1990) using the Dynamic Programming model, where the intention to work had a very small ex-post probability of becoming true. These results were obtained using RHS data only for males

[12] However, these authors only consider transitions into part-time or full-time jobs, not making the distinction between self-employment and employment, this therefore, qualifies our comparisons. Also, Blau (1994) concentrates only on men.

and less direct search variables, which maybe subject to higher measurement error.[13]

However, we have to acknowledge the possible endogeneity of `Searchj`. The respondent's searching decision can be correlated with unobservables that make that person more likely to find a job, resulting in an upward bias of our estimate due to this spurious correlation. We argue that this bias is not too large given that we are already controlling for a comprehensive array of characteristics of the respondents. Furthermore, we test the exogeneity of the searching decision, following Heckman (1978), by using a bivariate probit model of the decision to change labor force status and the decision to search for a job. In this set up, testing for exogeneity reduces to testing the independence of the probit equations. The Lagrange Multiplier test statistic is 0.01699, and since it follows a χ^2 distribution with one degree of freedom, we cannot reject the null hypothesis of independence of the probit equations or equivalently the exogeneity of our search decision.[14] This important result deserves further attention and a more precise look at the determinants of the searching activity. This is part of our ongoing research.[15]

Receiving disability payments decreases the probability of making a reverse transition. This result is only significant for females and reflects the fact that those receiving disability have major health problems and also the fact that they can only work during a trial period, otherwise they lose their benefits.

Personal income is positively and significantly related with the decision of returning to work as an employee. This could seem a puzzle, but it might mean that those people who were earning more from their previous jobs have more pressure to find a job, since their families have grown accustomed to their living standards. Rust (1989) considers income (and wealth) as a proxy for unobserved job skills which may make the worker more employable. This could also mean that individuals working continuously before exiting work, and therefore earning more than those displaced for longer periods, have higher chances of finding a job if they need one. That is why we introduce the variable `Monthp`, that reflects the proportion of months worked in the twelve months prior to the interview. This variable is significant for both the transitions into self-employment and the transitions into employment, and the coefficient is higher for those becoming employees. This is consistent across all specifications for the respondents becoming employed, and also consistent with the literature on the persistent effects of job displacement.

Receiving pensions is negatively related with becoming self-employed or employed, something we could expect. Net wealth is positively related to the decision of becoming self-employed, but the coefficient are not significant. However, it is negatively related and significant for the decision of employment, and

[13] Rust uses two variables: the self-reported planned hours of work in the year following the survey and the actual hours worked in the year following the survey.

[14] Appendix A explains in detail the construction of the test, showing also the probit results.

[15] See Benítez-Silva (2000).

robust across most specifications.[16] This is consistent with Blau (1994) who found that higher assets were associated with a decreased re-entry rate. Also consistent with Blau (1994) we find that whites are less likely to make reverse transitions.

Health variables are also quite important and in general negatively related with the decision to return to work. This agrees with the literature, Rust (1990), Blau (1994), Rust and Phelan (1997), Blau et al. (1997) and Quinn (1998) find comparable effects.[17] The most important health variables for the decision to become self-employed are the dummies for having a health limitation that prevents work, having high blood pressure and psychological problems.[18] For the decision to become employed, having difficulty reading a map has a negative effect, and having a health limitation that prevents work does as well. We also include a cognition variable, constructed from the results of a memory test. This variable is a number between 0 and 20 and reflects the number of words that respondents could remember out of a list read to them 20 minutes earlier. This variable is positive and significant for the transition to employment.

Another interesting specification is shown in Table 4, which uses a sub-sample of married respondents, including a dummy variable that is 1 if the respondent's spouse was non-employed at the time of the interview. We also include the difference between the spouses' ages, a variable that was found to be relevant among married women in Pozzebon and Mitchell (1989), and the health status of the spouse, a variable used in the literature.[19]

These variables could potentially capture some issues of preference for joint leisure or the complementarity of time spent in and out of the labor market. The fact that the respondent's spouse or partner was non-employed significantly decreases (more clearly for returning as an employee) the probability of returning to work. This agrees with Blau and Riphahn (1998) and Blau (1998).

If a respondent's spouse has a health limitation that limits work, he or she is more likely to return to work as self-employed, which is only significant for women and it is not significant for the transition into

[16] This is an interesting result given that this reveals an interesting effect of an important variable like current net wealth on the type of employment an individual takes. Giving us a better sense why is it worth splitting the way we have the sample of worker.

[17] The effect of health variables on labor market decisions has been, and still is, at the center of a controversial debate on the use of self-reported and objective variables in behavioral models. The possible endogeneity of the regressors coupled with measurement error could lead to substantial biases in the coefficients of interest. Most of the debate has concentrated on the effect of health on the retirement decision, but the extension of the arguments to the decision of returning to work is straightforward. We have tested the exogeneity of the self-reported health measures with respect to the decision of returning to work with the same model we tested the exogeneity hypothesis for the search decision and again found no evidence of endogeneity of any of these measures. The effect of health variables is important but does not seem to be overstated due to a suppose tendency of the respondents to rationalize their problems in the labor market using their health condition.

[18] The psychological problem dummy has the correct sign in most specifications in this and in the other estimations using the other two sub-samples. These results support previous literature more focused on the specific effects of these kinds of problems. See Currie and Madrian (1998, p.11) for a survey.

[19] The difference between the spouses' ages is calculated differently here. Pozzebon and Mitchell subtract the wife's age from the husband's. We subtract the spouse's or partner's age from the respondent's, regardless of the sex.

employment. This is in general agreement with Blau and Riphahn (1998), considering that they control for the interaction between the health and labor status of the spouse.

The difference of ages is positively and significantly related with the transition to employment, and given the different characterization of this variable, it is consistent with the results in Pozzebon and Mitchell (1989). They find, using a sub-sample of married women, that when the wife is younger than the husband she tends to retire earlier, again maybe proxying for some sort of joint labor force participation decision. In our case, high age difference reflects that the respondent is older, and in this case is more likely to return to work.

These results are important and consistent with Hurd (1990a) and probably proxy for the fact that older people seem to make joint labor force participation decisions, with a bias towards preferring decisions that allow them to spend time together, or that take into account the spouse's characteristics in the decision making process. We estimate this very same model with a sub-sample of younger respondents trying to see if this sign could reverse among them. We find that the variable became insignificant and that for that population the other covariates did a good enough job explaining the decisions. A dynamic game in a more theoretically charged model that tries to take into account the different value of one more period of work for both partners would be needed to analyze this question in full and is definitely high in our research agenda.

The direct comparison between males and females reveals that the important variables remain similar, with the clear importance of age dummies when interacted with insurance status. The search variable and having a health limitation have the same signs mentioned above. The proportion of working months is more important for women and receiving pensions has a stronger negative effect for women in the decision to return as self-employed.

It is worth mentioning the little significance across the board of education variables. Once we control for a large number of characteristics they are left with relatively little explanatory power. This contrasts with Peracchi and Welch (1994) who find that education is a good predictor of transitions but is more agreement with Blau (1994) who finds very small effects of education variables.

3.3 *Transitions from non-employment to employment: shorter transitions*

One of the important contributions of this paper is the use of monthly employment indicators to estimate shorter transitions. Most of the literature uses the survey to survey transitions, but several authors have emphasized that the ideal situation would be to have finer time periods. Blau (1994) is able to use quarterly data, and recently Blau and Gilleskie (1997) and Blau et al. (1997) use one year transitions. And as mentioned before, Blau and Riphahn (1998) use monthly German data.

We run binomial logit models for non-employed respondents with the dependent variable being the employment dummy variable at the different time intervals. We run monthly, quarterly, semi-annual and annual transitions, and also the usual biennial transition. In this case we cannot distinguish between employment and self-employment and we pool them into one category of employed if they had a one in the corresponding dummy variable. We run all these estimations for the sub-sample of non-employed and also for males and females. We present a summary of results in Table 5, only reporting a subset of variables but the specifications are available from the author upon request.

Table 5 presents three panels. Panel *A* uses the full sub-sample of non-employed respondents 50 years or older. We report in each panel the average probability, and the marginal effects as a proportion of the average probability for each estimation.[20]

The first important thing to notice is that the marginal effects vary depending on the time period of our estimation. The effect of having a limitation that prevents work and the effect of being married are the more stable ones. The importance of the `Searchj` variable on the probability of becoming employed seems to be stronger for shorter transitions, since it reflects search behavior in a short period before the interview. However, it has a very large positive effect for the transition to employment regardless of the periodicity. This is consistent with our previous results, and implies that our coefficient using the survey to survey transitions could be a lower bound if we believe that the relevant transitions happen in shorter time periods.

The effect of the percentage of months worked in the year prior to the interview follows a similar pattern and is also consistent, since the past attachment to the labor force should have a decreasing influence once the person is out of the labor market for longer periods of time. The effects of other important variables, such as receiving disability payments or being 62 and health insured, are also stronger for the shorter transitions.

Panels *B* and *C* report the results for males and females. The effects are very similar, but it is important to notice the stronger effect for women of the search variable and the labor force attachment variables, especially for the shorter transitions. And it is among them that we see larger differences between the effects of the variables using the shorter transitions and the two year results, implying that if we do not consider these finer time intervals we could be underestimating the effects of these variables for women.

The conclusion from these shorter estimations is that the variables we identified as important in the survey to survey transitions remain the relevant ones. However, the effects vary significantly. We must be

[20] For continuous variables the marginal effects are computed as the average derivative of the estimated choice probability with respect to the variable in question. For dummy variables they are the average of the difference between the probability with the binary variable set to 1 and the probability with the binary variable set to 0.

aware of this if we think that the relevant transitions are the shorter ones. However, it is not clear what the appropriate time interval to look at is if we were trying to reach a sharper conclusion on the effects of different variables. One might think that monthly transitions are potentially very noisy, since we do not consider that maybe an individual has a erratic labor force trajectory. But again, the same can be said about the survey to survey transitions since respondents are interviewed at an arbitrary point in time.

It is important to emphasize that our results are consistent regardless of the time period chosen, but we acknowledge the need for a dynamic perspective to analyze the labor force trajectories of older Americans. Thanks to the monthly employment indicators, we will be able to characterize different patterns of labor force trajectories over the 1989-1997 period, flagging every respondent depending on his or her pattern of attachment to the labor force. This will be an important contribution to the study of older workers and their retirement and labor market decisions.[21]

3.4 *Transitions from self-employment to non-employment and employment*

In Table 6 we present the results for the transitions from self-employment to the other two states. These are results rarely reported in the literature, except as a subset of those employed. However, as we have seen above it seems to be justified to split the sample in this way because the effects of the explanatory variables can be different for the two types of workers. Given that we have fewer observations, the fit is not as good and there are not as many significant variables across specifications.

The results for the full sample show that for transitions from self-employment to employment only a few variables are significant. Here, having higher net wealth has a negative effect on switching to employment, which probably means that, other things equal, if a person's business is going well they have no incentive to change. The effect of this variable is also negative for transitions to non-employment. Having higher wealth probably means that the business is doing better and therefore the person's chances of becoming non-employed decrease considerably. We find few significant health variables. Having difficulty stooping is positively correlated with the transition to employment and might be proxying for activities more common if the person runs his or her own business. Having a health limitation that interferes with the person's work has the correct signs but it is only significant for the transitions to non-employment. Cognition variables also have the correct signs: being in better mental health measured by memory and cognitive tests decreases the probability of becoming non-employed.

[21] Initial results show that a high proportion of respondents exhibit "normal" patterns, either continuous work or continuous non-employment along with different patterns of transitions into retirement. We also identify an important number of respondents with less conventional labor force participation patterns and their analysis is part our research agenda.

A very important variable for the decision to become an employee is the proportion of months that respondents' worked during the previous year. The more they worked, the less likely they were to switch. This is again intuitive, if we believe that working a lot in their own businesses means that they are doing well and will probably not join another company. Total hours worked in the last year is also negatively related to exiting work, which is plausible as well. Having psychological problems such as stress increases the chances of leaving work, and so does being age 62.

The higher the self assessed probability of working full time when they reach 62 or 65 the less likely they are to make a transition, proxying for the expectation of continuing with their businesses. The male indicator has a negative and significant effect for transitions to non-employment, as was expected given the empirical transition probabilities, where women had a much higher transition probability of becoming non-employed.

Comparing the estimation results for men and women, the difference between the two groups in reference to the dummy for marital status is interesting. For women, being married is positively related with going out of work, and negatively with joining a company, while for men exactly the opposite is true. Being white is significant and negative for males exiting work, and positive for becoming employed, while for women race is insignificant. The expectations variable comes out significant for men but insignificant for women.

If we restrict our attention to married respondents, Table 7, and introduce a dummy that is 1 if the respondent's spouse or partner is self-employed at the time of the interview, the probability of making a transition out of self-employment decreases, a result that can be interpreted as supporting the complementarity of time hypothesis. This variable, however, is only significant for women. We also introduce a dummy that is 1 if the person's spouse has a health limitation that limits work. This variable is positive and significant for women for both transitions, but negative and insignificant for men.

3.5 *Transitions from employment to non-employment and self-employment*

In Table 8 we present the results for the transitions from employment to the other two states. Given that this is the most numerous sub-sample, the number of significant variables is quite high across specifications, especially for the transitions to non-employment.

The effect of having access to retiree health insurance is positive, but only significant for males, on the probability of exiting work, a result consistent with Karoly and Rogowski (1997). However, by also considering in the analysis respondents older than 61 we are able to capture interesting effects for this age group, something not present in most of the literature. The effects of age peak at 63-64, something

consistent with the fact that once respondents reach that age they will not lose their health coverage (for example) if they choose to leave the work force given the current COBRA laws, and the fact that by the next interview they will probably reach the normal retirement age and therefore have access to Medicare or Medicaid.[22] The main differences between those age 62 at the time of the interview that make a transition and those that stay employed, are that the transitioners receive health insurance from their employers or past employers in a lower proportion, especially insurance paid by the employer, and in a higher proportion receive government health insurance and disability payments. In a sense, these characteristics reflect less attachment to their employers and health conditions that result in changes in labor force status. If we focus on those 65 and over, the transitioners are males, married, and white in a higher proportion. A higher proportion of them receives government health insurance or disability payments, and in a lower proportion have access to paid retiree health insurance. They also have, comparatively, a lower age difference with their spouses or partners. These respondents can again be identified as the "health insurance constrained" described by Rust and Phelan (1997).

Also, receiving pensions, having a health limitation, psychological problems or difficulties performing activities of daily living have the expected positive impact on the transition out of work. On the other hand, having worked more in the last year seems to be negatively related with this decision and so does reporting being in excellent or good physical health or mental health. These results are in general agreement with previous literature. The self-assessed probability of working full time by age 65 or over has a negative effect on this transition, proxying for general expectations about the labor force attachment of the respondent.

The transition to self-employment presents less significant variables but some very clear results. Being white, male, wealthy and with a health limitation significantly increases the likelihood of starting a business, and so does expecting to be working by age 65. However, having difficulty walking multiple blocks, self-reporting fair health, or having worked a lot in the last year are negatively related to this decision.

Looking separately at men and women, the important variables are the same ones. Some of the results sharpen when looking at these sub-samples, like the strong effect of being 62 or 63-64 and with retiree health insurance on the transition out of work, or the negative effect of the expectations to work after 65 on the same transition.

The specification considering only married employees, Table 9, is again of interest. We introduce a dummy that is 1 if the respondent's spouse was an employee at the time of the interview. In this case, the respondent is less likely to exit the employment status, consistent with our previous results on the com-

[22] In alternative specifications we interacted the age dummies with the health insurance variable and obtained a similar pattern of coefficients that lead to the very same interpretation.

plementarity of spouses' time. Another dummy that takes the value 1 if the person's spouse has a health limitation that limits work is positive and significant for women exiting work, but insignificant for men. This result differs from the findings in Pozzebon and Mitchell (1989) and Blau (1998). They report that for women, the spouse's health condition has a negative effect on the exit rate, meaning that respondents tend to delay retirement. Both groups of researchers use the RHS where women are underrepresented, but more importantly, they do not control for health insurance status, and in fact justify the result as meaning that couples depend on the wife's insurance if the husband is in poor health, forcing the wife to stay employed. Once this is controlled for, the signs change.

The expectations variable is also very important for this sub-sample, decreasing the probability of exiting work and increasing the transition to self-employment, probably characterizing people that feel they can continue working for a long time after they reach age 65.

3.6 *Transitions from employment to non-employment: shorter transitions*

Here we turn again to analyze the shorter transitions using binomial logits for the decision to leave the employment status. In Table 10 we present the summary results along three panels. We report in each table the average probability, and the marginal effects as a proportion of the average probability for each estimation. Panel *A* uses the full sub-sample of employed respondents 50 years or older. Our results are consistent with the survey to survey transition estimates, but now some of the coefficients are not significant so we see some swings in the marginal effects of the important variables.

We can again see that most variables have a stronger effect for the shorter transitions, except for the dummy that interacts being 63-64 and having access to retiree health insurance, this effect is higher for the annual and two year transitions, result driven by men. This could reflect the fact that once the respondents reach age 63-64 (62 for our female sub-sample) they retire at different time intervals, but by age 65, a high proportion of those that wanted to retire will have done so. We must emphasize the stability of the marginal effect of the expectations variable: the self-assessed probability of working full time by age 65 is negatively and significantly related to becoming non-employed, and its effect is very similar regardless of the time period of the transition we pick. This is expected if we believe this variable is picking up unobservable characteristics of the respondents that are more or less stable over time.

4 Conclusions

In this paper we use the first three waves of the HRS to add some insight to the literature on labor force transitions, using a more current and complete source of data. This is one of the first attempts to analyze the trends in retirement and labor supply among this population using all three waves of the survey. This is also the first panel study to track employment to the monthly level with American data

We have paid special attention to reverse transitions, something less studied than transitions into retirement. One of our initial concerns was to study these reverse transitions in depth to verify whether they have increased due to the healthy state of the economy, and to learn more about these determinants in a time that more of this kind of transitions can be expected for individuals 55 and older. Several important variables in our specification can be interpreted as supporting this trend, and the evidence from the labor force participation rates using BLS data seem to point in that direction. We emphasize, however, that this study concentrates on the micro determinants of labor force status and does not address the macroeconomic issues that are also important in explaining this trend.

We also estimate the labor force decisions of married respondents, including dummies for the labor force status of the spouse, their ages and their health, and the results show a preference for joint leisure and/or complementarity of time between spouses. These results are consistent with previous literature using data from the 1970's and early 80's. The analysis of joint retirement behavior deserves special attention in future research.

It is also worth emphasizing that we use a slightly different characterization of labor force status from the one use in the literature, since we distinguish between being self-employed and being employed for someone else. This makes some of our results less comparable with previous research, but at the same time we investigate this issue in much more depth than previous studies do, and we find that thanks to splitting the sample in this fashion we captured different effects of the explanatory variables on the various transitions probabilities and avoid possible offsetting effects of some variables.

We use a multinomial and a binomial logit model for estimating the decisions to change labor force status at each interview date as an approximation to a more involved model of the transition behavior. The reduced form nature of our analysis uncovers interesting relationships that, however, cannot be interpreted in a causal way. We run separate estimations for the three sub-samples of non-employed, employed and self-employed respondents, and also for more narrowly defined sub-samples such as males and females.

In the decisions to return to work the interaction of age dummies with health insurance status reveals a "spike" at 62 and a 65+ effect, and a negative effect on the probability of returning to work. Among

the employed, we find that access to retiree health insurance has a positive effect on the probability of becoming non-employed (especially for men). These results are consistent with the important effects of health insurance in labor market outcomes that have been found in the literature.

The effect of marriage is quite interesting and consistent with previous research. Married men are more likely to return to work as employees and less likely to leave the workforce. The opposite is true for married women. Health and cognition variables are also significant and have the expected signs across specifications, where being in worse health status, by a wide variety of measures, has a negative effect on the probability of returning to work and a positive effect on becoming non-employed.

One of the most important and significant variables positively affecting the decision to return to work (especially as a paid employee) is the respondent's job search decision. We interpret this as a variable that allows us to distinguish between those out of the labor force and those still active in the labor market, and for some sort of implied business cycle effect, since the willingness to find a job has such a strong positive effect on the probability of finding it, which means that the labor market is healthy enough to accommodate most of the reverse transitioners. These results contrast with previous results in the literature that did not find a significant effect of the searching decision on the probability of finding a job afterwards. We acknowledge the possible endogeneity of this variable, and test the exogeneity of the searching decision using a bivariate probit model. We do not reject its exogeneity at any standard level of significance.

Income in the year before the interview is positively related to returning to work. This could mean that those that were earning more are more likely to re-entry. This possibility is confirmed when we introduce a variable that shows the proportions of months worked during the year prior to the interview. This is a significant variable for the transitions to employment, consistent with the literature on the persistence of job displacement. The longer the period that the person spends non-employed the less likely he or she is to return to work. Also, more work in the year prior to the decision reduces the likelihood of making a transition from employment or from self-employment.

Finally, an important contribution of this paper is the estimation of shorter transitions using monthly employment indicators. We run monthly, quarterly, semi-annual and annual transitions for the decisions to exit the employment status or to return to it. Our results are consistent with the findings using the survey to survey intervals, but most of the important variables have stronger effects for the shorter transitions, implying that the estimates using longer time periods could be a lower bound for the true effect of some variables. We argue that a dynamic study of labor force trajectories using these monthly dummies will be a relevant contribution to the literature, and it is part of our undergoing research.

We consider that these results make a contribution to the literature. However, many issues are still not

addressed, for example, the role of smaller companies and non-profit organizations in hiring older workers since they could be cheaper, because these workers might need lower investments in pension and health benefits, or training costs. Those companies can use the savings and the experience delivered by older workers. Also, we might think that the service sector is the one preferred by the elderly because it allows for more flexibility and convenience.

Another important issue is the incidence of part-time work in these transitions, which one might think would be higher among the elderly. This is something that could be included in the model as another employment state.

Many of these studies focus on older workers, but a lot of insight could also be obtained by studying immigrants, temporary workers, low income individuals or minorities.[23] An interesting area of future research is to integrate these analyses to compare how public policy and the business cycle is affecting the decisions of these populations.

It is a fact that the labor market is changing, and the labor supply and demand of and for older workers is not an exception. We interpret some of our results as supporting the increasing trend of longer careers and second careers among older individuals, in a healthy and growing labor market. This has some policy implications because it can give us a different perspective on the issue of the future solvency of the Social Security and Retirement system. In a healthy economy maybe it will not matter that much that the proportion of older people increases with respect to previous decades, because their working lives will last longer as life expectancy increases and a majority of jobs require more knowledge and less physical strength. This also means that the elderly in the near future will have to keep up with the technological changes, otherwise they will find themselves with the jobs that others do not want or will decide to stay out of the labor market increasing the inflationary pressures in a strong economic environment.[24]

[23] Even combinations of those characteristics are worth studying as the labor supply decisions of particular groups can be strongly influencing the entire market. See Flippen and Tienda (1996) for an study on Hispanic older workers in the US labor force.

[24] See Friedberg (1999a) for a discussion of the impact of technological change on older workers, and Benítez-Silva (2000) for a model that tries to shed light on human capital investment decisions at the end of the life cycle.

Table 1. Panel A: Means and Standard Deviations

Variable	Full Sample	Non-Employed Sub-Sample	Self-Employed Sub-Sample	Employed Sub-Sample
N	19,769	7,117	2,393	10,259
Age	57.63	59.21	57.48	56.58
	(0.06)	(0.15)	(0.12)	(0.05)
White	73.54	68.92	82.76	74.69
	(0.30)	(0.53)	(0.74)	(0.43)
Male	45.28	38.68	61.54	50.05
	(0.34)	(0.56)	(0.95)	(0.49)
Married	80.76	79.17	87.29	78.19
	(0.27)	(0.47)	(0.65)	(0.41)
Divorced	16.44	17.65	10.71	18.77
	(0.25)	(0.44)	(0.61)	(0.39)
Bachelor Degree	20.74	12.96	26.60	24.17
	(0.28)	(0.39)	(0.87)	(0.42)
Professional Degree	7.31	3.78	9.87	9.09
	(0.18)	(0.22)	(0.58)	(0.28)
Family Income	60,350	49,119	84,086	61,591
	(1,618)	(2,976)	(3,886)	(2,416)
Resp. Income	22,229	5,357	46,187	28,533
	(652)	(841)	(4,717)	(371)
Income from Pensions	4,712	6,415	2,616	4,372
	(785)	(987)	(256)	(1,484)
Net Worth	236,249	215,813	528,982	182,027
	(3,372)	(4,850)	(18,146)	(3,401)
Housing Wealth	73,054	69,548	102,565	69,674
	(899)	(1,217)	(4316)	(1,208)
Hours Worked	1,441	327	2,061	1,937
	(7)	(9)	(22)	(7)
% Months Worked last year	0.66	0.10	0.97	0.98
	(0.00)	(0.00)	(0.00)	(0.00)
Government Health In.	0.18	0.34	0.10	0.09
	(0.00)	(0.01)	(0.01)	(0.00)
Employer Health-In.	0.71	0.54	0.55	0.85
	(0.00)	(0.01)	(0.01)	(0.00)
Private Health-In.	0.15	0.15	0.27	0.12
	(0.00)	(0.00)	(0.01)	(0.00)
Receiving Disability	0.06	0.18	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Retired	0.16	0.38	0.09	0.03
	(0.00)	(0.01)	(0.01)	(0.00)

Table 1. Panel B: Means and Standard Deviations

Variable	Full Sample	Non-Employed Sub-Sample	Self-Employed Sub-Sample	Employed Sub-Sample
N	19,769	7,117	2,393	10,259
Non-elegible SSI	0.92	0.86	0.94	0.95
	(0.00)	(0.00)	(0.00)	(0.00)
Pr.Working Full Time 62+	44.28	22.55	55.86	45.28
	(0.33)	(0.86)	(0.84)	(0.41)
Pr.Working Full Time 65+	28.35	23.15	43.77	25.70
	(0.31)	(1.03)	(0.81)	(0.36)
Pr.Living to 75	64.44	60.40	69.41	66.11
	(0.21)	(0.38)	(0.57)	(0.28)
Pr.Living to 85	44.10	42.29	47.33	44.37
	(0.22)	(0.40)	(0.64)	(0.32)
Health Limitation for work	22.20	45.48	13.90	8.80
	(0.28)	(0.57)	(0.68)	(0.28)
Health Limitation prevents work	10.56	29.79	0.42	0.18
	(0.21)	(0.52)	(0.13)	(0.04)
Age Spouse	55.24	56.98	54.30	54.96
	(0.08)	(0.16)	(0.13)	(0.12)
Age Difference	1.29	1.44	2.11	1.67
	(0.05)	(0.09)	(0.14)	(0.06)
Spouse N-Employed	0.37	0.47	0.30	0.31
	(0.00)	(0.01)	(0.01)	(0.01)
Spouse Employed	0.46	0.37	0.38	0.53
	(0.00)	(0.01)	(0.01)	(0.01)
Spouse S-Employed	0.11	0.09	0.26	0.09
	(0.00)	(0.01)	(0.01)	(0.01)
Spouse has Hlimwk.	20.66	24.88	7.73	18.75
	(0.22)	(0.44)	(0.81)	(0.44)
Spouse has Hlimpw.	9.24	12.71	5.71	7.87
	(0.22)	(0.44)	(0.49)	(0.31)

Table 1 Panel C: Means and Standard Deviations

Variable	Full Sample	Non-Employed Sub-Sample	Self-Employed Sub-Sample	Employed Sub-Sample
N	19,769	7,117	2,393	10,259
		Objective Health Measures:		
Hospital Stays	0.23	0.42	0.12	0.14
	(0.01)	(0.02)	(0.01)	(0.01)
Doctor Visits	5.26	7.44	3.63	4.17
	(0.06)	(0.13)	(0.11)	(0.06)
High Blood pressure	22.18	25.19	18.58	21.66
	(0.28)	(0.50)	(0.76)	(0.41)
Diabetes	6.76	9.72	4.72	5.37
	(0.17)	(0.34)	(0.42)	(0.22)
Cancer	2.39	3.24	1.61	2.10
	(0.10)	(0.20)	(0.25)	(0.14)
Stroke	1.03	2.45	0.19	0.30
	(0.07)	(0.18)	(0.09)	(0.05)
Psychological Problems	6.83	10.67	4.49	4.52
	(0.17)	(0.35)	(0.41)	(0.21)
Back Problems	32.12	39.87	27.95	27.98
	(0.32)	(0.56)	(0.88)	(0.44)
Feet Problems	33.03	43.75	25.60	27.88
	(0.32)	(0.57)	(0.86)	(0.44)
Nursing Home Stays	0.57	1.38	0.15	0.14
	(0.05)	(0.13)	(0.08)	(0.04)
Memory Test 1	7.72	7.27	7.92	7.88
	(0.02)	(0.04)	(0.06)	(0.03)
Memory Test 2	5.78	5.34	6.00	5.91
	(0.02)	(0.04)	(0.06)	(0.03)
Cognitive Test	6.20	5.72	6.61	6.35
	(0.02)	(0.04)	(0.06)	(0.03)
		Subjective Health Measures and ADL:		
Excellent Health	20.85	13.21	28.10	23.60
	(0.28)	(0.39)	(0.88)	(0.42)
Fair Health	14.36	21.45	10.29	10.81
	(0.24)	(0.47)	(0.60)	(0.31)
Poor Health	7.05	16.73	2.00	1.93
	(0.17)	(0.43)	(0.27)	(0.14)
Worse Health	2.98	3.09	2.92	2.93
	(0.00)	(0.01)	(0.01)	(0.01)
Excellent Cognition	17.12	13.91	2.84	17.77
	(0.26)	(0.40)	(0.82)	(0.38)
Poor Cognition	2.95	6.28	0.73	1.28
	(0.11)	(0.28)	(0.17)	(0.11)
Diff. Wlk. M.Blocks	14.35	27.39	8.09	7.49
	(0.24)	(0.51)	(0.54)	(0.26)
Diff. Climbing Stairs	9.48	19.63	3.49	4.23
	(0.20)	(0.46)	(0.36)	(0.20)
Diff. Stooping	27.43	41.24	8.51	20.70
	(0.30)	(0.57)	(0.76)	(0.40)

Table 2: Empirical Transition Probabilities

Panel A. Transitions from wave 1 to wave 2. Males 50 and over.

	Employed Wave 2	S-Employed Wave 2	N-Employed Wave 2	Observations
Employed Wave 1	0.8065	0.0367	0.1568	2,832
S-Employed Wave 1	0.0782	0.8142	0.1076	818
N-Employed Wave 1	0.0842	0.0454	0.8704	1,389
Observations	2,465	833	1,741	5,039

Panel B. Transitions from wave 1 to wave 2. Females 50 and over.

	Employed Wave 2	S-Employed Wave 2	N-Employed Wave 2	Observations
Employed Wave 1	0.8258	0.0160	0.1582	2,686
S-Employed Wave 1	0.0745	0.7404	0.1851	416
N-Employed Wave 1	0.0822	0.0313	0.8866	2,045
Observations	2,417	415	2,315	5,147

Panel C. Transitions from wave 2 to wave 3. Males 50 and over.

	Employed Wave 3	S-Employed Wave 3	N-Employed Wave 3	Observations
Employed Wave 2	0.7968	0.0326	0.1706	2,303
S-Employed Wave 2	0.0899	0.7844	0.1257	756
N-Employed Wave 2	0.0853	0.0420	0.8728	1,501
Observations	2,031	731	1,798	4,560

Panel D. Transitions from wave 2 to wave 3. Females 50 and over.

	Employed Wave 3	S-Employed Wave 3	N-Employed Wave 3	Observations
Employed Wave 2	0.7961	0.0197	0.1842	2,438
S-Employed Wave 2	0.0819	0.6725	0.2457	403
N-Employed Wave 2	0.0752	0.0289	0.8960	2,182
Observations	2,138	382	2,503	5,023

Table 3: Estimations for Not-Employed Transitioners to Self-Employment and Employment

		Not-Employed to Self-Employed						Not-Employed to Employed					
No.	Variable	Subsample		Males		Females		Subsample		Males		Females	
		Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error
1	Constant	-3.0776	0.4442	-3.0949	0.6417	-2.8490	0.6264	-1.6047	0.2864	-2.1960	0.4954	-1.4920	0.3689
2	Male	0.6082	0.1798	—	—	—	—	0.0213	0.1303	—	—	—	—
3	Married	0.1311	0.2394	0.0895	0.3330	0.1751	0.3615	-0.3943	0.1478	0.2659	0.2910	-0.6860	0.1881
4	White	-0.0588	0.1971	-0.3563	0.2663	0.3413	0.3183	-0.1505	0.1395	-0.2542	0.2197	-0.0322	0.1945
5	No Diploma	0.2738	0.1752	0.3308	0.2571	0.2707	0.2497	0.0375	0.1235	-0.0356	0.1964	0.0422	0.1640
6	Voc. Training	0.2265	0.1774	0.5292	0.2468	-0.1134	0.2892	0.1671	0.1342	0.0828	0.1995	0.2344	0.1802
7	Wave2-Ind	-0.3451	0.2017	0.1093	0.3024	-0.8399	0.2686	-0.1349	0.1585	0.1913	0.2693	-0.2239	0.2130
8	Age 55-59	-0.0232	0.2590	-0.0385	0.3798	0.0137	0.3627	-0.3385	0.1792	-0.2446	0.3081	-0.3169	0.2214
9	Age 60-61	0.1656	0.3113	0.2249	0.5021	0.2732	0.4093	-1.1228	0.3139	-0.3678	0.4772	-1.5870	0.4512
10	Age 62	0.0839	0.4388	0.4392	0.5895	-0.2748	0.7797	-0.7070	0.3985	-0.0683	0.5644	-1.3157	0.6668
11	Age 63-64	0.0718	0.4434	0.2824	0.5539	0.0068	0.7825	-0.8538	0.4174	-0.4295	0.5529	-1.4086	0.6649
12	Age 65 +	-0.1925	0.4547	-0.1216	0.5465	0.2747	1.0057	-0.5029	0.3165	-0.6518	0.4575	-0.0516	0.5270
13	Insured 55-59	-0.5773	0.2805	-0.4683	0.4029	-0.5802	0.3973	-0.2554	0.2011	0.0120	0.3142	-0.5182	0.2675
14	Insured 60-61	-1.3216	0.4087	-1.3462	0.6084	-1.4914	0.5974	0.0364	0.3612	-0.8615	0.5747	0.5423	0.4985
15	Insured 62	-1.5620	0.5987	-1.9572	0.7558	-0.8533	1.0324	-0.9647	0.5028	-1.8369	0.6909	-0.0246	0.7867
16	Insured 63-64	-1.0111	0.5310	-1.1951	0.6369	-0.5931	0.9522	-0.0716	0.4740	-0.2804	0.5728	0.0208	0.8471
17	Insured 65 +	-0.6540	0.5582	-0.6357	0.6099	-0.9134	1.3949	-0.4719	0.3687	-0.3796	0.4324	-0.6281	0.7266
18	Gov. Insurance	-1.4102	0.2842	-1.4740	0.3703	-1.2933	0.4769	-0.2135	0.1633	-0.1146	0.2539	-0.3130	0.2182
19	Searchj	0.7242	0.2076	1.2172	0.2805	0.0246	0.3967	1.4702	0.1422	1.7267	0.2246	1.2348	0.1981
20	Income ($1,000)	0.0110	0.0047	0.0172	0.0052	-0.0130	0.0212	0.0091	0.0037	0.0131	0.0046	0.0190	0.0113
21	Pentot. ($1,000)	-0.0184	0.0127	0.0051	0.0142	-0.0537	0.0252	-0.0049	0.0080	0.0060	0.0126	-0.0099	0.0101
22	Nworth($10^5)	0.0070	0.0190	0.0010	0.0310	0.0070	0.0300	-0.0800	0.0370	-0.1080	0.0690	-0.0630	0.0470
23	MonthP	0.8337	0.2493	0.5457	0.3689	1.4524	0.3544	1.4994	0.1711	1.3438	0.2649	1.5559	0.2454
24	Receiving DI	0.1381	0.3832	0.5778	0.5224	-1.3771	0.9385	-0.2962	0.2791	0.0626	0.3933	-0.6355	0.3981
25	Hbloodp	-0.6726	0.2314	-0.6321	0.3126	-0.7619	0.3605	0.0634	0.1548	-0.0200	0.2422	0.1355	0.2103
26	Pshyc	-1.0398	0.4711	-1.3216	0.7510	-0.9552	0.6065	0.1331	0.2158	-0.0255	0.3746	0.1284	0.2757
27	Memory Test	0.0465	0.0247	0.0645	0.0380	0.0431	0.0332	0.0261	0.0193	0.0238	0.0334	0.0285	0.0243
28	Dif-Wkmb	0.1662	0.2429	0.1309	0.3696	0.3232	0.3297	-0.3761	0.1868	-0.2834	0.2879	-0.4656	0.2485
29	Dif-rmap	-0.1034	0.2315	0.1405	0.3852	-0.2241	0.2919	-0.2026	0.1640	-0.3640	0.3726	-0.1554	0.1892
30	Hlimpw	-1.0615	0.3554	-0.8052	0.5183	-1.6031	0.5795	-1.0348	0.2485	-1.2193	0.3892	-0.9586	0.3093
31	Ex-Health	0.3354	0.2160	0.5329	0.3124	0.0948	0.3090	0.1915	0.1630	-0.1659	0.2616	0.4180	0.2186
32	Vg-Health	0.0958	0.2081	0.4362	0.3019	-0.2364	0.2933	0.0285	0.1438	-0.0216	0.2170	0.0432	0.1972
33	Fair-Health	0.0510	0.2468	0.0158	0.3417	0.0930	0.3708	-0.1126	0.1889	-0.4043	0.2865	0.1074	0.2544
34	Poor-Health	-0.3226	0.4278	-0.5721	0.5580	0.3867	0.6634	-0.3770	0.2987	-0.9755	0.5294	0.0298	0.3595
	Avg. Log L/Obs.	-0.3731	5,125	-0.3693	2,241	-0.3630	2,884	-0.3731	5,125	-0.3693	2,241	-0.3630	2,884

Table 4: Estimations for Not-Employed Married Transitioners to Self-Employment and Employment

		Not-Employed to Self-Employed						Not-Employed to Employed					
No.	Variable	Subsample		Males		Females		Subsample		Males		Females	
		Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error
1	Constant	-3.5172	1.0343	-2.6911	1.3802	-2.4522	1.0768	-0.4772	0.6092	0.9755	0.9278	-0.5497	0.6584
2	Male	0.9563	0.3505	—	—	—	—	0.1862	0.2669	— —	—	—	
3	White	0.2713	0.3292	-0.2657	0.4209	1.2224	0.6092	-0.6799	0.2224	-1.0523	0.3610	-0.4486	0.3125
4	BA	0.1778	0.3784	-0.0940	0.5110	0.3957	0.5263	-0.1605	0.2900	-0.5414	0.4815	0.1027	0.3663
5	Prof. Degree	0.1115	0.5821	0.6676	0.6815	-0.6630	1.1957	0.2727	0.4435	0.5510	0.7007	-0.4911	0.6595
6	Nssi	0.7913	0.7932	0.2343	0.8195	—	—	-0.4583	0.4302	-0.6772	0.7311	—	—
7	Wave2-Ind	-0.3660	0.5145	0.0266	0.5828	-0.4291	0.8654	-0.5794	0.3917	-0.7232	0.6354	-0.9287	0.4633
8	Age 55-59	0.2668	0.4454	0.5667	0.6572	0.0029	0.4002	-0.6843	0.3668	0.0274	0.5689	-0.8408	0.2543
9	Age 60-61	0.8543	0.5670	1.3450	1.1073	-0.8297	0.6057	-0.4407	0.5876	1.8055	1.0279	-1.8650	0.5024
10	Age 62	0.4987	0.8231	0.4976	1.2977	0.3506	0.7186	-0.6159	0.9393	-0.2388	1.5853	-1.0191	0.5616
11	Age 63-64	1.3283	0.5980	1.7842	0.7553	-0.3782	0.9715	-2.0273	1.1204	-0.0973	0.9929	-1.3825	0.6985
12	Age 65 +	-0.1529	1.1904	-1.2428	0.6706	-1.6488	1.3259	-1.0562	0.9286	-1.0031	0.5719	-2.0014	0.7820
13	Insured 55-59	-0.6077	0.4490	-0.9406	0.6572	—	—	0.1000	0.3780	-0.2761	0.5731	—	—
14	Insured 60-61	-2.2675	0.7643	-2.1064	1.1868	—	—	-0.9041	0.6686	-2.4466	1.1388	—	—
15	Insured Age 62	-1.0478	0.9234	-1.0515	1.3172	—	—	-1.3992	1.0762	-2.5654	1.9606	—	—
16	Insured 63-64	-1.4693	0.6105	-1.6586	0.6874	—	—	1.0570	1.1737	-0.2458	1.0299	—	—
17	Insured 65 +	-1.4166	1.2105	—	—	—	—	-0.5144	0.9001	–	—	—	—
18	Searchj	0.5100	0.4376	0.8610	0.6421	0.3165	0.6307	1.6430	0.2455	1.3366	0.4472	1.5031	0.3432
19	Income ($1,000)	-0.0150	0.0201	-0.0161	0.0222	0.0524	0.0526	0.0087	0.0107	0.0351	0.0153	0.0364	0.0194
20	Pentot. ($1,000)	-0.0018	0.0231	0.0031	0.0301	0.0558	0.0207	-0.0311	0.0257	-0.1633	0.0959	-0.0098	0.0227
21	Nworth($10^5)	-0.0760	0.0740	0.0030	0.0500	-2.8960	1.7910	-0.1010	0.1150	-0.8070	0.3430	-0.0760	0.0780
22	MonthP	1.3595	0.3525	1.0679	0.4996	2.1514	0.5726	1.5956	0.2630	1.3896	0.4040	1.6333	0.3599
23	Receiving DI	-0.4835	0.5878	-0.0662	0.7868	—	—	-0.4357	0.5098	-0.2650	0.7101	—	—
24	Health Insured	-0.5732	0.3292	-0.4722	0.2234	-1.2473	0.3739	-0.0632	0.234	-0.0543	0.1567	-0.0479	0.3048
25	Retired	-0.9459	0.3577	-0.8907	0.5531	-0.9296	0.6743	-0.2181	0.2565	-1.3077	0.4993	0.1789	0.3173
26	Spouse NE	-0.4355	0.3125	0.0901	0.4723	-1.2844	0.5723	-0.3767	0.2132	-0.5273	0.3212	-0.4199	0.2932
27	Age Diff.	0.0189	0.0240	-0.0020	0.0486	0.0487	0.0272	0.0333	0.0154	0.0216	0.0202	0.0441	0.0273
28	Health Sp.	0.5032	0.3937	0.2048	0.5427	1.0702	0.6942	-0.0712	0.2998	-0.5746	0.5823	-0.0146	0.3482
29	Hbloodp	-1.1148	0.5818	-0.5174	0.5891	-0.0131	0.0392	0.3499	0.3134	0.3890	0.6096	—	—
30	Pshyc	-1.2194	1.0935	-0.8018	1.3037	0.5846	0.4272	-0.0260	0.4283	-1.2198	0.7226	—	—
31	Memory Test	0.0013	0.0339	0.0489	0.0558	-0.4776	0.4752	0.0409	0.0300	0.0982	0.0543	0.0083	0.0360
32	Dif-Wkmb	0.0698	0.3925	-0.5837	0.6027	—	—	-0.1566	0.3028	-0.7416	0.5768	0.2318	0.3457
33	Dif-rmap	0.0038	0.3211	0.5839	0.4297	—	—	-0.1378	0.2558	-0.3695	0.5576	-0.1055	0.3023
34	Hlimpw	-0.7023	0.5209	-0.5467	0.6535	-1.0482	0.6954	-1.1569	0.4536	-2.0418	0.6524	-0.8735	0.5015
35	Ex-Health	-0.0548	0.3583	-0.0070	0.5064	0.0014	0.5414	-0.1255	0.2906	-0.8759	0.5795	0.2329	0.3483
36	Vg-Health	0.0276	0.3134	0.3130	0.4388	-0.2016	0.4483	-0.1581	0.2208	0.2850	0.3356	-0.4773	0.3157
37	Fair-Health	0.0606	0.3785	-0.1705	0.5389	0.1634	0.5376	-0.5820	0.3109	-0.6610	0.4451	-0.6073	0.4260
38	Poor-Health	-0.0446	0.5555	0.0673	0.6827	-1.0129	1.1371	-0.6117	0.5166	-1.4473	0.9762	-0.3569	0.5382
	Avg. Log L/Obs.	-0.27	2,918	-0.301	1,106	-0.314	1,316	-0.27	2,918	-0.301	1,106	-0.314	1,316

Table 5: Average Probabilities and Marginal Effects for the Non-Employment to Employment Transitions. Binomial Logits[25]

Panel A. Sub-Sample of those age 50 and over

	1 month	3 months	6 months	12 months	24 months
Average Probability	0.033	0.040	0.053	0.065	0.126
Health Limitation Prevents work	-0.315	-0.209	-0.675	-0.628	-0.627
% of Months worked last year	1.791	1.705	1.277	1.191	1.309
Searched for a job last month	2.361	2.847	2.628	2.479	1.307
Insured and 62	-0.678	-0.569	-0.491	-0.718	-0.608
Receiving DI	-0.675	-0.584	-0.317	*-0.141*	-0.226
Married	-0.341	-0.334	-0.309	*-0.020*	-0.1819

Panel B. Sub-Sample of males age 50 and over

	1 month	3 months	6 months	12 months	24 months
Average Probability	0.039	0.045	0.059	0.071	0.131
Health Limitation Prevents work	-0.401	-0.460	-0.865	-0.861	-0.609
% of Months worked last year	1.353	1.551	0.919	0.780	0.945
Searched for a job last month	2.146	2.128	2.408	2.512	1.574
Insured and 62	-0.489	-0.492	*-0.052*	-0.731	-0.817
Receiving DI	*-0.479*	*-0.423*	*0.061*	*0.3425*	*0.083*
Married	*-0.080*	*-0.064*	-0.353	*0.065*	*0.149*

Panel C. Sub-Sample of Females age 50 and over

	1 month	3 months	6 months	12 months	24 months
Average Probability	0.0297	0.0369	0.0494	0.0595	0.1217
Health Limitation Prevents work	-0.508	*-0.044*	-0.5535	-0.480	-0.667
% of Months worked last year	2.221	1.672	1.193	1.363	1.628
Searched for a job last month	2.655	3.483	3.070	2.430	0.978
Insured and 62	-0.870	-0.851	-0.890	-0.720	*-0.179*
Receiving DI	—	-0.755	-0.726	-0.565	-0.564
Married	-0.501	-0.4794	*-0.183*	*-0.025*	-0.425

[25]Selected Variables. Marginal Effects are in times the Average Probability. All regressions also include dummies for being male, white, and having made the decision in wave 2. Also education levels, ages interacted with health insurance status, income, wealth, self reported health variables, ADLs, objective health measures and cognition variables. All the marginal effects come from significant coefficients at the 5% or 10% level, except for those reported in italics.

Table 6: Estimations for Self-Employed Transitioners to Non-Employment and Employment

		Self-Employed to Non-Employed						Self-Employed to Employed					
No.	Variable	Subsample		Males		Females		Subsample		Males		Females	
		Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error
1	Constant	0.6688	1.2813	1.5568	1.5978	-2.0108	2.2355	-0.1723	1.1997	0.1880	1.6054	-1.0922	2.0210
2	Male	-0.5108	0.2528	—	—	—	—	0.3414	0.3169	—	—	—	—
3	Married	0.0939	0.3898	-0.0338	0.6266	0.0959	0.5189	-0.5459	0.3408	0.3287	0.5627	-1.1526	0.4997
4	White	-0.3658	0.3229	-0.5279	0.4045	-0.1767	0.5410	-0.1289	0.3885	-0.0615	0.4602	0.1688	0.7688
5	BA	-0.1273	0.3422	0.2412	0.4118	-0.0724	0.4066	-0.1122	0.3461	-0.2847	0.3450	0.6950	0.6084
6	Prof. Degree	0.6151	0.4416	0.5119	0.4118	-0.1891	0.4391	-0.3586	0.4794	0.1058	0.4102	-0.4239	0.7272
7	Wave2-Ind	-0.6526	0.2759	-0.6108	0.3721	-0.9226	0.4732	-0.0811	0.3658	-0.8458	0.5052	0.7179	0.7059
8	Age 55-59	-0.3743	0.2818	-0.6013	0.3871	-0.2428	0.4148	0.4380	0.3040	0.2516	0.3690	0.8018	0.5932
9	Age 60-61	0.7428	0.3067	0.3334	0.4492	1.0142	0.4571	-0.1304	0.4376	-0.2382	0.5639	-0.1005	0.8800
10	Age 62	1.0225	0.4284	0.7242	0.5324	1.4926	0.7751	0.2430	0.5979	-0.4552	0.7945	1.6428	1.0187
11	Age 63-64	-0.1422	0.8175	-1.3402	1.0287	—	—	0.6767	0.8428	0.4712	0.9944	—	—
12	Health Insurance	0.3586	0.3971	0.1119	0.5541	0.2921	0.5429	-0.0764	0.3977	0.4700	0.5855	-1.0836	0.6620
13	Income ($1,000)	-0.0050	0.0049	-0.0000	0.0037	-0.0107	0.0204	0.0025	0.0036	0.0074	0.0034	-0.0032	0.0155
14	Pentot. ($1,000)	-0.0033	0.0014	0.0057	0.0198	-0.0067	0.0260	-0.0558	0.0048	-0.2979	0.0951	0.0354	0.0307
15	Nworth($10^5)	-0.0250	0.0260	-0.0890	0.0440	0.0110	0.0310	-0.0340	0.0560	-0.2070	0.0900	0.0310	0.0280
16	Total Hwkd.	-0.0022	0.0013	-0.0252	0.0203	-0.0257	0.0248	-0.0157	0.0134	-0.0281	0.0176	0.0008	0.0203
17	MonthP	-0.7063	1.0713	-1.5673	1.1943	1.1750	1.9933	-2.1108	0.9696	-1.9965	1.3309	-1.7483	1.2111
18	Pr.WFT65	-0.3113	0.3433	-0.3560	0.4262	-0.1213	0.6454	-0.5180	0.3725	-0.1723	0.4452	-1.6421	0.7114
19	Pshyc	0.8089	0.4837	0.0206	1.0592	—	—	0.7175	0.5085	1.4984	0.6051	—	—
20	Memory Test	-0.0602	0.0484	-0.0112	0.0720	-0.0964	0.0640	-0.0239	0.0478	-0.0643	0.0624	-0.0176	0.0958
21	Cognition Test	-0.0277	0.0438	-0.0093	0.0624	0.0039	0.0613	0.0904	0.0462	0.1218	0.0541	0.0059	0.0814
22	Dif-Stairs	0.9125	0.5808	-0.6366	0.9653	2.1433	0.8414	0.8590	0.7831	0.0080	1.0877	2.0186	0.9885
23	Dif-Stoop	0.3089	0.2910	0.0270	0.4910	0.7173	0.4087	0.5319	0.3085	0.6136	0.3631	0.6001	0.6623
24	Hlimwk	0.4540	0.3479	0.6049	0.4185	0.3162	0.5870	-0.2324	0.3734	-0.2360	0.4305	-0.5089	0.9482
25	Ex-Health	-0.5358	0.4242	-1.1259	0.5357	0.4295	0.7302	-0.1125	0.5869	-0.7595	0.6670	0.8867	1.1165
26	Vg-Health	-0.4214	0.4049	-0.8827	0.4928	0.5156	0.7041	0.1602	0.5303	-0.3843	0.5829	1.1676	1.1522
27	Good-Health	-0.4306	0.3796	-1.0094	0.4773	0.4129	0.6897	0.6234	0.5234	0.5004	0.5446	0.8425	1.2493
	Avg. Log L/Obs.	-0.544	958	-0.4881	632	-0.5733	326	-0.544	958	-0.4881	632	-0.5733	326

Table 7: Estimations for Married Self-Employed Transitioners to Non-Employment and Employment

		Self-Employed to Non-Employed						Self-Employed to Employed					
No.	Variable	Subsample		Males		Females		Subsample		Males		Females	
		Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error
1	Constant	2.0503	1.7622	3.0263	2.6591	4.0836	2.4983	-0.5921	1.7962	0.2547	2.2461	-2.8029	3.3255
2	Male	-0.4288	0.3094	—	—	—	—	0.0064	0.4037	—	—	—	—
3	White	0.3939	0.5239	0.6350	0.8037	0.2174	0.8616	-0.7332	0.5132	0.1354	0.6905	-1.9523	0.8894
4	BA	0.0992	0.4293	-0.4882	0.6883	0.7319	0.6447	-0.1853	0.5139	-0.2402	0.5952	0.4876	0.8386
5	Prof. Degree	0.5304	0.5516	1.0768	0.7906	0.8864	0.8156	-0.6931	0.9211	-0.9804	1.1807	0.8069	1.5677
6	Wave2-Ind	-0.8879	0.4771	-0.6545	0.6300	-1.0483	0.9841	-0.0894	0.5974	-0.4612	0.6955	1.4924	1.0173
7	Age 55-59	-0.5079	0.4223	-1.1940	0.6734	-0.6330	0.6677	0.3675	0.3942	0.3747	0.4464	-0.8917	1.0929
8	Age 60-61	0.7842	0.4497	0.3760	0.6010	1.5698	0.6813	0.1966	0.6057	-0.2681	0.7852	-0.2726	0.8485
9	Age 62	1.4187	0.5523	1.1284	0.7034	—	—	0.6088	0.7865	-0.1156	1.2219	—	—
10	Age 63-64	1.7997	1.1320	—	—	—	—	3.1996	1.7948	—	—	—	—
11	Income ($1,000)	0.0017	0.0028	0.0008	0.0030	0.0245	0.0131	-0.0027	0.0048	0.0006	0.0035	0.0267	0.0202
12	Pentot. ($1,000)	-0.0262	0.0240	—	—	—	—	-0.6748	0.8139	—	—	—	—
13	Nworth($10^5)	-0.0220	0.0280	-0.0370	0.0270	0.0060	0.0490	0.0160	0.0250	-0.0290	0.0390	0.0890	0.0370
14	Total Hwkd.	-0.0293	0.0177	-0.0256	0.0221	-0.0463	0.0261	-0.0268	0.0185	-0.0297	0.0212	-0.0308	0.0295
15	MonthP	-1.6130	1.4919	-2.5153	2.1603	-2.4165	1.8522	-0.1952	1.4273	-0.5553	2.0452	2.2770	2.5026
16	Pr.WFT65	-0.3072	0.4440	-0.1159	0.5388	-0.6376	0.8964	-0.4119	0.5396	-0.5289	0.6250	-0.0155	0.9705
17	Spouse SE	-0.4517	0.4219	-0.0184	0.5009	-1.7597	0.9395	-0.2071	0.5039	-0.6750	0.6130	0.0711	0.9142
18	Age spouse 62+	0.5979	0.4816	-0.0179	0.0332	-0.0230	0.0637	-1.5297	1.0154	0.0352	0.0240	-0.0163	0.0314
19	Health Sp.	0.2927	0.3707	-0.3881	0.5181	1.0168	0.5966	0.0584	0.4776	-0.5823	0.6215	0.9455	0.7472
20	No. Hosp.	0.2297	0.3398	0.1669	0.4224	—	—	0.1738	0.3363	0.1989	0.3620	—	—
21	Pshyc	0.7027	0.6058	-0.6063	0.9775	—	—	0.8594	0.9088	0.7544	0.9705	—	—
22	Memory Test	0.0152	0.0530	0.0320	0.0743	-0.0464	0.0873	-0.0921	0.0731	-0.0050	0.0836	-0.2260	0.1337
23	Cognition Test	-0.1032	0.0599	-0.1452	0.0817	0.0107	0.0887	0.0782	0.0706	0.0683	0.0832	-0.0006	0.1285
24	Dif-Stairs	0.1137	0.8429	—	- —	—	0.2492	1.0586	—	—	—	—	
25	Dif-Stoop	0.7216	0.3788	0.5909	0.5189	0.8233	0.5418	0.3970	0.3778	0.6616	0.4364	0.2559	0.8578
26	Hlimwk	0.9723	0.4235	1.1450	0.5481	0.8568	0.5983	-0.4824	0.5271	-0.5493	0.5312	-0.0732	1.2041
27	Worse Health	-0.3550	0.2295	-0.4313	0.4041	-0.5396	0.3301	-0.1435	0.2396	-0.3723	0.2955	-0.2518	0.4904
28	Ex-Health	-0.0519	0.5384	-0.2180	0.6417	-0.5110	0.6050	-0.8663	0.8689	-1.9022	1.1069	0.3599	1.0028
29	Vg-Health	-0.2889	0.5196	-0.4219	0.6020	-0.5560	0.5365	0.1635	0.7673	-0.5074	0.8474	1.0094	0.8423
30	Good-Health	-0.1372	0.4816	-1.0863	0.6684	—	—	0.9202	0.7330	0.6830	0.7188	—	—
	Avg. Log L/Obs.	-0.50	630	-0.462	413	-0.509	215	-0.50	630	-0.462	413	-0.509	215

Table 8: Estimations for Employed Transitioners to Non-Employment and Self-Employment

		Employed to Non-Employed						Employed to Self-Employed					
No.	Variable	Subsample		Males		Females		Subsample		Males		Females	
		Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error
1	Constant	-1.2058	0.4743	-0.6329	0.7943	-0.8284	0.5508	-4.9466	1.1268	-3.8698	1.1360	-7.0860	1.6684
2	Male	-0.0534	0.0936	—	— —	–	0.7853	0.2280	—	—	—	—	
3	Married	-0.0177	0.1051	-0.3122	0.1789	0.129	0.1272	-0.2054	0.2414	-0.0793	0.3571	-0.4002	0.3846
4	White	0.0015	0.1010	0.0269	0.1537	0.0167	0.1362	0.7269	0.3035	0.5497	0.3651	1.0762	0.5821
5	No Diploma	0.1423	0.0966	0.0266	0.1425	0.2203	0.1313	0.4042	0.2389	0.6309	0.3259	0.0611	0.3787
6	Voc. Training	0.2065	0.1015	0.1677	0.1450	0.2516	0.1431	-0.1098	0.2675	-0.1271	0.3303	0.0357	0.4496
7	N-eligible DI/SSI	0.2480	0.2244	-0.0883	0.2962	0.1018	0.1706	0.4603	0.6286	0.0926	0.5984	0.7608	0.5816
8	Wave2-Ind	-0.0972	0.1035	-0.1508	0.1514	—	—	0.5339	0.2210	0.3183	0.2702	—	—
9	Age 55-59	0.4472	0.1016	0.6449	0.1565	0.2781	0.1345	-0.2701	0.2176	0.0367	0.2692	-0.8883	0.4213
10	Age 60-61	1.4360	0.1175	1.6285	0.1782	1.2876	0.1595	0.2423	0.2934	0.3253	0.3834	0.1244	0.4838
11	Age 62	1.8818	0.1696	2.2950	0.2328	1.3777	0.2684	0.1845	0.4575	0.0321	0.6483	0.6059	0.6316
12	Age 63-64	2.0351	0.2756	2.3788	0.3189	—	—	1.1898	0.5433	1.5523	0.5780	—	—
13	Age 65 +	1.0910	0.4497	1.8672	0.5119	—	—	0.8101	0.7727	1.3628	0.7961	—	—
14	Income ($1,000)	0.0020	0.0010	0.0013	0.0019	0.0079	0.0048	0.0029	0.0015	0.2067	0.3784	-0.0171	0.0195
15	Pentot. ($1,000)	0.0073	0.0060	0.0044	0.0106	0.0093	0.0086	-0.0131	0.0218	0.0036	0.0012	0.0063	0.0261
16	Nworth($10^5)	0.0180	0.0120	0.0140	0.0180	0.0260	0.0170	0.0460	0.0180	-0.0211	0.0300	0.1010	0.0351
17	Total Hwkd.	-0.0093	0.0078	-0.0123	0.0122	-0.0075	0.0106	-0.0170	0.0201	0.0220	0.0150	0.0128	0.0360
18	MonthP	-1.2745	0.4224	-1.0065	0.7326	-1.3536	0.5014	-0.9993	0.8492	0.6113	0.3233	0.7744	1.2073
19	Health Insurance	0.1349	0.1249	-0.0483	0.1757	0.3057	0.1831	-0.0403	0.2915	0.8124	0.3594	-0.4938	0.4834
20	P-Wrk. FT 65+	-1.2131	0.1597	-1.4852	0.2369	-0.9307	0.2185	0.6472	0.2637	-1.0509	0.6078	0.7372	0.4769
21	Pshyc	0.2047	0.1826	0.2716	0.2765	—	—	-0.0424	0.5410	0.9285	0.5975	—	—
22	Memory Test	-0.0144	0.0142	-0.0439	0.0236	0.0047	0.0179	0.0855	0.0298	-0.3594	0.3180	0.0212	0.0464
23	Dif-Wkmb	0.3389	0.1518	0.4521	0.2442	0.2024	0.1956	-1.2756	0.6049	0.1379	0.6554	-1.5324	1.2071
24	Dif-stairs	0.0293	0.2005	0.2751	0.3599	-0.0547	0.2471	0.7653	0.5188	0.1242	0.0394	0.5801	0.9321
25	Dif-stoop	0.1772	0.1053	0.1142	0.1625	0.2363	0.1390	-0.1717	0.2569	-0.0249	0.0265	0.0860	0.4389
26	Hlimwk	0.2863	0.1469	0.4760	0.2032	0.0967	0.2198	0.8716	0.2995	-1.4602	1.0282	0.8325	0.5489
27	Ex-Health	-0.2355	0.1174	-0.1602	0.1700	-0.8666	0.2080	-0.1563	0.2564	-0.1294	0.3303	1.2015	1.0053
28	Vg-Health	-0.1775	0.1020	-0.0661	0.1467	-0.8416	0.1901	-0.1731	0.2344	0.0030	0.2903	0.8258	0.9850
29	Gd-Health	—	—	—	—	-0.5524	0.1814	—	—	—	—	1.4372	0.9481
30	Fair-Health	0.3463	0.1344	0.1470	0.2011	—	—	-0.4806	0.4219	-0.1838	0.4835	—	—
31	Poor-Health	0.5627	0.2778	0.4983	0.3515	—	—	0.3294	0.7498	0.7052	0.8129	—	—
	Avg. Log L/Obs.	-0.4487	5,881	-0.4586	2,933	-0.4295	2,950	-0.4487	5,881	-0.4586	2,933	-0.4295	2,950

Table 9: Estimations for Married Employed Transitioners to Non-Employment and Self-Employment

		Employed to Non-Employed						Employed to Self-Employed					
No.	Variable	Subsample		Males		Females		Subsample		Males		Females	
		Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error	Est.	St.Error
1	Constant	-1.6642	0.5108	-1.5249	0.7748	-1.4782	0.6593	-5.1148	1.2383	-4.4598	1.6204	-6.5100	1.9904
2	Male	-0.0461	0.1199	—	—	—	—	0.9343	0.2996	—	—	—	—
3	White	0.1631	0.1393	0.0676	0.1874	0.3797	0.2043	0.6741	0.3631	0.5014	0.4168	1.1599	0.7630
4	BA	-0.0253	0.1478	0.0005	0.2020	0.0543	0.2065	0.7565	0.2524	1.2310	0.2959	-0.5147	0.6599
5	Prof. Degree	-0.0051	0.2232	-0.1507	0.3050	0.2674	0.3270	-0.8377	0.4127	-1.2732	0.4589	0.5258	0.9775
6	N-eligible SSI	0.2396	0.3012	-0.0029	0.4111	0.3808	0.4232	-0.7505	0.5353	-0.8533	0.5697	-0.3085	1.1692
7	Wave2-Ind	-0.2275	0.1773	-0.5168	0.2548	-0.4732	0.2453	0.0346	0.3755	-0.0816	0.4426	-0.5546	0.6627
8	Age 55-59	0.3028	0.1203	0.4094	0.1765	0.1111	0.1578	-0.2950	0.2482	-0.3308	0.2867	-0.3789	0.4587
9	Age 60-61	1.2360	0.1528	1.1879	0.2103	1.0636	0.2171	0.0725	0.3710	-0.2510	0.4876	0.6140	0.5741
10	Age 62	1.6023	0.2206	1.9048	0.2787	0.7052	0.3932	0.2101	0.5132	0.1274	0.6110	0.7748	0.9677
11	Age 63-64	1.8198	0.3926	1.6530	0.4081	—	—	0.9565	0.8144	0.8947	0.8296	—	—
12	Income ($1,000)	-0.0044	0.0039	-0.0066	0.0053	-0.0247	0.0092	-0.0047	0.0080	-0.0071	0.0085	-0.0215	0.0354
13	Pentot. ($1,000)	0.0162	0.0107	0.0174	0.0168	0.0133	0.0139	-0.0816	0.0472	-0.2575	0.1294	0.0180	0.0271
14	Nworth($10^5)	0.0240	0.0160	0.0440	0.0230	0.0330	0.0200	0.0150	0.0340	0.0330	0.0360	-0.0910	0.1280
15	Total Hwkd.	-0.0297	0.0085	-0.0257	0.0126	—	—	-0.0438	0.0179	-0.0418	0.0211	—	—
16	Pr.WFT65	-0.9491	0.2047	-1.0860	0.2744	-0.7624	0.3040	0.6420	0.3132	0.6807	0.3700	1.0647	0.6017
17	Spouse E.	-0.3114	0.1608	-0.5478	0.2334	-0.1517	0.2163	-0.1979	0.2940	0.0764	0.3723	-0.8522	0.5483
18	Spouse Age 62+	0.0964	0.2197	0.6392	0.4504	0.2457	0.2552	0.1378	0.5224	1.3623	0.6821	-1.0440	0.6849
19	Health Sp.	0.2782	0.1484	0.0804	0.2277	0.4625	0.1892	0.4959	0.3026	0.4043	0.3956	0.3955	0.4791
20	Hospital stays	—	—	—	—	—	—	—	—	—	—	—	—
21	Pshyc	0.1846	0.2496	-0.2000	0.4639	-0.0761	0.0766	0.0215	0.6087	0.3930	0.6289	-0.9261	0.9580
22	Memory Test	-0.0270	0.0182	-0.0915	0.0297	0.0182	0.0220	0.0478	0.0379	0.0648	0.0489	0.0063	0.0572
23	Dif-Reading Map	—	—	—	—	0.1140	0.1783	—	—	—	—	-0.0092	0.5532
24	Dif-Walk.M.B	0.1660	0.1933	0.4584	0.2921	—	—	-1.1555	0.5009	-0.6392	0.4990	—	—
25	Dif-Stairs	0.2130	0.2483	0.4450	0.4193	—	—	0.1256	0.4874	0.7059	0.4882	—	—
26	Pr. Liv to 75	0.2856	0.2019	0.1630	0.2877	0.0806	0.2604	0.3475	0.4546	0.2374	0.5266	1.2689	0.7788
27	Hlimwk	0.1771	0.1884	0.1976	0.2661	0.3426	0.2354	0.6799	0.3581	0.2582	0.4528	1.0872	0.6325
28	Worse Health	0.0909	0.0875	0.2763	0.1367	-0.0948	0.1164	0.3930	0.2356	0.3828	0.2738	0.4551	0.3698
29	Ex-Cognition	-0.1672	0.1975	0.0681	0.2661	-0.3049	0.2958	0.4129	0.5271	0.7749	0.6827	0.1197	0.8817
30	Vg-Cognition	-0.2729	0.1716	-0.0737	0.2400	-0.4460	0.2362	0.0172	0.5262	0.3891	0.6776	-0.1916	0.8225
31	Gd-Cognition	-0.1259	0.1711	0.0825	0.2430	-0.3256	0.2312	0.2612	0.5349	0.4150	0.7115	0.4016	0.8106
32	Ex-Health	-0.2415	0.1544	-0.0717	0.2142	-0.5855	0.2012	-0.2028	0.3142	-0.3300	0.3721	0.4261	0.5724
33	Vg-Health	-0.1310	0.1312	-0.0223	0.1840	-0.3944	0.1673	-0.1406	0.2871	-0.2815	0.3459	0.5533	0.5213
34	Fair-Health	0.2951	0.1812	-0.1055	0.2601	—	—	-0.6647	0.5176	-0.4340	0.5393	—	—
35	Poor-Health	1.1326	0.3974	1.0021	0.4957	—	—	-0.0011	0.9430	0.3057	0.9666	—	—
	Avg. Log L/Obs.	-0.444	3,830	-0.44	2,119	-0.4539	1,840	-0.444	5828	-0.44	2,119	-0.4539	1,840

Table 10: Average Probabilities and Marginal Effects for the Employment to Non-Employment Transitions. Binomial Logits[26]

Panel A. Sub-Sample of those age 50 and over

	1 month	3 months	6 months	12 months	24 months
Average Probability	0.0189	0.030	0.051	0.085	0.121
Health Limitation for work	0.943	*0.296*	0.411	*0.202*	0.360
% Months worked last year	-1.046	-1.331	-2.024	-1.128	-1.067
55-57 with Retiree H-I.	*0.238*	*0.240*	*-0.121*	0.327	0.221
63-64 with Retiree H-I.	—	*0.674*	1.959	2.919	2.255
No High School Diploma	*0.314*	0.643	*0.126*	0.188	0.293
Prob. Working FT by age 65	*-0.495*	*-0.293*	-0.594	-0.671	-0.792

Panel B. Sub-Sample of males age 50 and over

	1 month	3 months	6 months	12 months	24 months
Average Probability	0.0145	0.0280	0.0543	0.0749	0.1086
Health Limitation for work	2.252	*0.384*	*0.297*	*0.070*	0.505
% Months worked last year	*-1.193*	-1.826	-2.175	-1.457	-1.183
55-57 with Retiree H-I.	*0.306*	*0.108*	*0.017*	*0.261*	*0.244*
63-64 with Retiree H-I.	—	—	1.661	1.983	2.871
No High School Diploma	*0.526*	*0.377*	*0.007*	*0.138*	0.234
Prob. Working FT by age 65	-1.149	-0.711	-0.729	-0.923	-1.014

Panel C. Sub-Sample of Females age 50 and over

	1 month	3 months	6 months	12 months	24 months
Average Probability	0.0233	0.0326	0.0478	0.0945	0.132
Health Limitation for work	*0.173*	*0.141*	*0.613*	*0.351*	*0.234*
% Months worked last year	-1.005	*-0.978*	-1.925	-0.873	-1.030
55-57 with Retiree H-I.	*0.246*	*0.381*	*0.285*	0.360	*0.199*
62 with Retiree H-I.	*0.567*	2.817	1.724	1.612	1.539
No High School Diploma	*0.185*	0.822	*0.258*	*0.218*	0.311
Prob. Working FT by age 65	*-0.137*	*0.113*	*-0.470*	-0.597	-0.804

[26]Marginal Effects are in times the Average Probability. All regressions also include dummies for being male, married, white, non-eligible for disability insurance and having made the decision in wave 2. Also education levels, ages interacted with health insurance status, income, wealth, self reported health variables, ADLs, objective health measures and cognition variables. All the marginal effects come from significant coefficients at the 5% or 10% level, except for those reported in italics.

Figure 1: Labor Force participation. Males 55 to 64

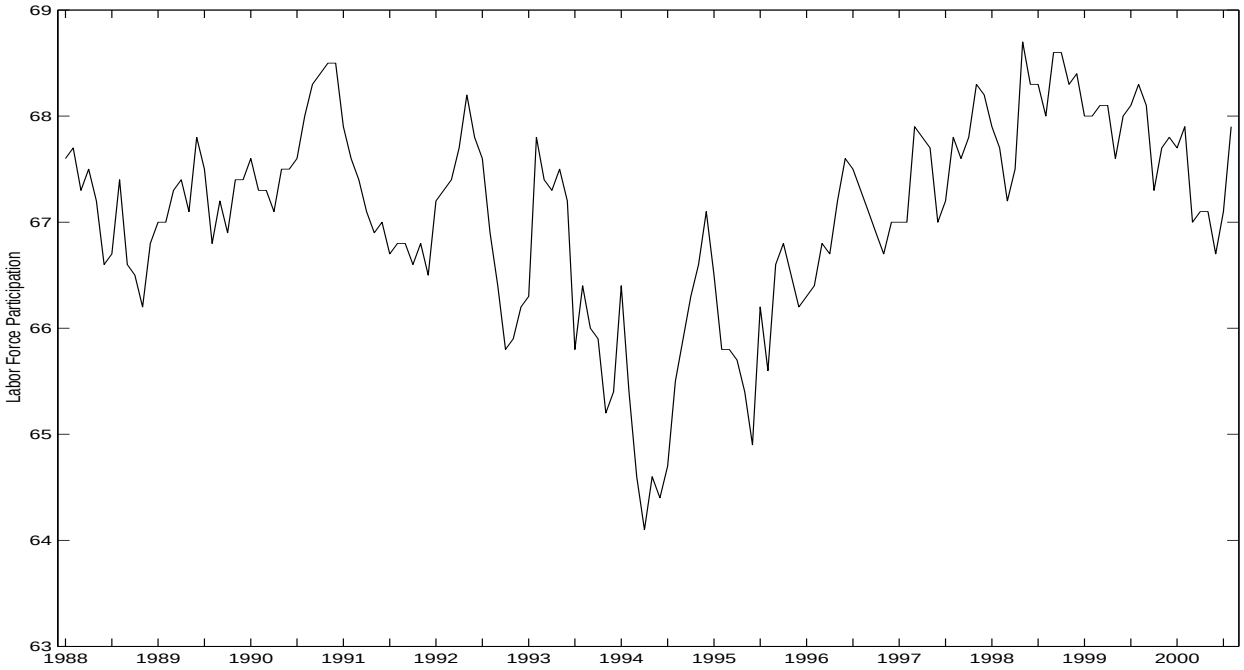
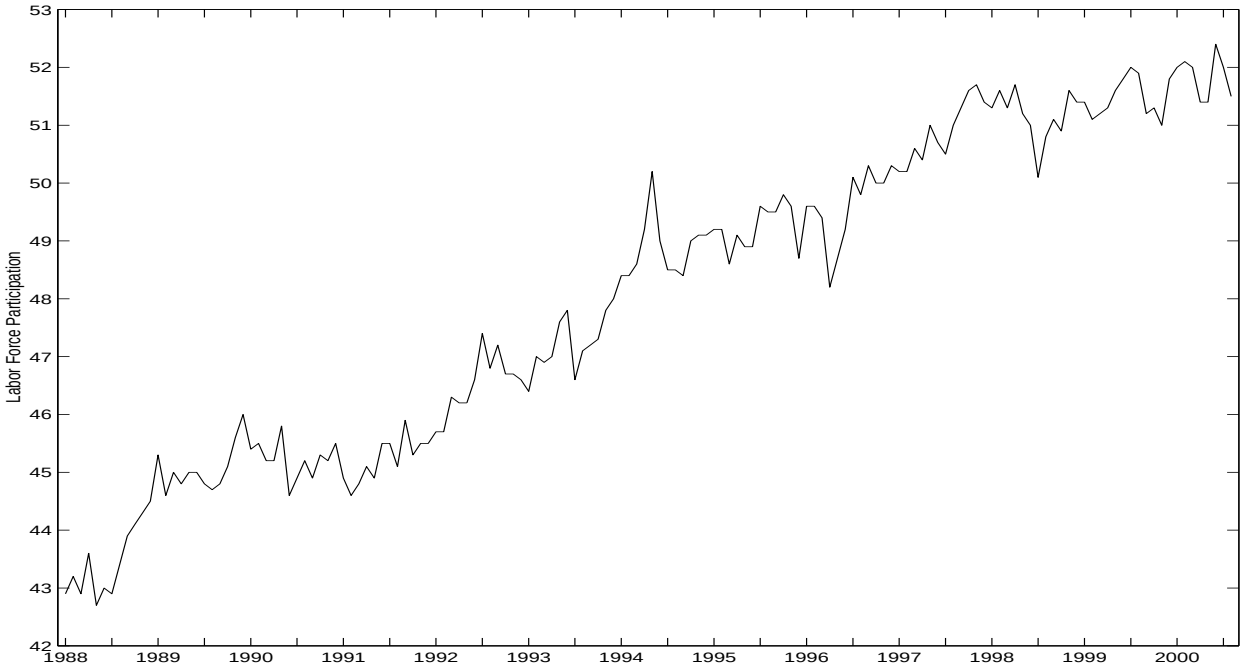


Figure 2: Labor Force participation. Females 55 to 64



Appendix A

In this Appendix we borrow from Heckman (1978), Kiefer (1982) and Greene (1993) to show how we test for the exogeneity of the searching decision in our estimations.[27]

Consider a two equation system:

$$y^*_{1i} = X_{1i}\beta_1 + d_i\alpha_1 + y^*_{2i}\gamma_1 + U_{1i} \tag{1}$$

$$y^*_{2i} = X_{2i}\beta_2 + d_i\alpha_2 + y^*_{1i}\gamma_2 + U_{2i} \tag{2}$$

where the dummy variable d_i is defined by: $d_i = 1$ iff $y^*_{2i} > 0$, and $d_i = 0$ otherwise.

It is important to emphasize that the system above represents two continuous latent variables that generate observable discrete dummy variables (y_{1i} and y_{2i}) when they reach a threshold. This model is flexible enough, as Heckman (1978) shows, to include a number of important specifications. The case that we are interested in is one where equation (1) represents the structural equation of interest, in our case the decision to become employed in the next period (employment for a third party and self-employment are not distinguish for the purpose of this test) and (2) represents the searching decision that might be endogenous. In equations (1) and (2), X_{1i} and X_{2i}, are respectively, $1 \times K_1$ and $1 \times K_2$ row vectors of bounded exogenous variables. The joint density of continuous random variables U_{1i}, U_{2i} is $g(U_{1i}, U_{2i})$ which is assumed to be a bivariate normal density, with mean normalized to be 0 and the 2×2 covariance with variances normalized to 1, and correlation coefficient $\rho \in (-1, 1)$.

Our objective is to test exogeneity of the searching decision with respect to the structural decision. Without lost of generality we can consider a simple characterization of the system under the null hypothesis of exogeneity of the search variable, by setting $\alpha_2 = 0, \gamma_1 = 0,$ *and* $\gamma_2 = 0$. This model then reduces to a standard bivariate probit model, where the test for independence of the probit equations is equivalent for us to a test of exogeneity of the searching decision. If we cannot reject that $\rho = 0$ then we can safely assume exogeneity in our estimations. If we reject the null hypothesis we will have to estimate the structural parameters through a bivariate probit with a structural shift.

Therefore, we test the independence of the probit equations resulting from (1) and (2). The simplest method to construct the test of the hypothesis that $\rho = 0$ follows Kiefer (1982) and Greene (1993). The construction of the Lagrange Multiplier (LM) test only requires the estimation of the two independent probits:

$$LM = \frac{f^2}{h} \tag{3}$$

where f and h are calculated as follows:

$$f = \sum_i q_{1i} q_{2i} \frac{\phi(w_{1i})\phi(w_{2i})}{\Phi(w_{1i})\Phi(w_{2i})} \tag{4}$$

$$h = \sum_i \frac{[\phi(w_{1i})\phi(w_{2i})]^2}{\Phi(w_{1i})\Phi(-w_{1i})\Phi(w_{2i})\Phi(-w_{2i})} \tag{5}$$

where,

$$q_{1i} = 2y_{1i} - 1, \textit{ and } \; q_{2i} = 2y_{2i} - 1 \tag{6}$$

$$w_{1i} = q_{1i}\beta_1' X_{1i}, \textit{ and } \; w_{2i} = q_{2i}\beta_2' X_{2i} \tag{7}$$

[27] Benítez-Silva et al. (2000) also use this approach in their study of the Social Security Disability award process.

Table A1 presents the estimates of the independent probits for the employment and search decisions. The LM test statistic for this specification is 0.0169 and follows a χ^2_1, delivering a P-value of 0.896, so we cannot reject the null hypothesis of exogeneity of the search decision. The LM test statistic is simpler to calculate than the Wald statistic and the Likelihood Ratio that require the estimation of the bivariate probit, and given that we have more than 4,000 observations we believe our results are not sensitive to the test statistic used.

Table A.1: Probit Estimates of the Employment and Search decisions

		Not-Employed to Employed		Searching Decision	
No.	Variable	Estimate	Standard Error	Estimate	Standard Error
1	Constant	-0.785	0.178	-0.285	0.182
2	Male	0.1664	0.065	0.448	0.079
3	Married	-0.199	0.082	-0.428	0.088
4	White	-0.079	0.072	-0.429	0.079
5	No Diploma	0.080	0.061	0.156	0.075
6	Vocational Training	0.024	0.066	0.016	0.082
7	Wave2-Ind	-0.144	0.096	-0.228	0.122
8	Age 55-59	-0.137	0.111	0.210	0.125
9	Age 60-61	-0.182	0.164	-0.094	0.178
10	Age 62	-0.269	0.204	-0.449	0.232
11	Age 63-64	-0.375	0.214	-0.073	0.236
12	Age 65 +	-0.312	0.178	-0.138	0.226
13	Insured 55-59	-0.169	0.116	-0.463	0.126
14	Insured 60-61	-0.395	0.180	-0.484	0.195
15	Insured 62	-0.537	0.241	-0.180	0.266
16	Insured 63-64	-0.121	0.233	-0.793	0.276
17	Insured 65 +	-0.190	0.188	-0.809	0.269
18	Government Insurance	-0.288	0.087	-0.491	0.116
19	Own Health Insurance	0.035	0.096	-0.440	0.104
20	Income ($1,000)	0.003	0.002	-0.000	0.003
21	Pentot. ($1,000)	-0.005	0.004	-0.020	0.006
22	Nworth(10^5)	-0.026	0.016	-0.062	0.024
23	MonthP	0.736	0.093	0.953	0.096
24	Receiving DI	-0.093	0.129	-0.264	0.152
25	Hbloodp	-0.066	0.085	-0.002	0.103
26	Pshyc	-0.040	0.124	0.273	0.128
27	Memory Test	0.014	0.009	0.014	0.010
28	Dif-Wkmb	-0.201	0.091	-0.038	0.112
29	Dif-rmap	-0.137	0.080	-0.058	0.094
30	Hlimpw	-0.454	0.110	-0.621	0.121
31	Ex-Health	0.110	0.083	0.141	0.097
32	Vg-Health	0.016	0.073	0.094	0.088
33	Fair-Health	-0.024	0.092	0.070	0.105
34	Poor-Health	-0.093	0.138	-0.270	0.176
35	Searchj	0.816	0.084	—	—
	Avg. Log L/Obs.	-0.2991	4,175	-0.2088	4,175

References

Benítez-Silva, H., M. Buchinsky, H-M. Chan, J. Rust and S. Sheidvasser: (2000), "How Large is the Bias in Self-reported Disability Status?" NBER Working Paper No. 7526.

Benítez-Silva, H. (2000): "A Dynamic Model of Job Search Behavior over the Life Cycle," manuscript, Yale University.

Blau, D., and R. T. Riphahn (1998): "Labor Force Transitions of Older Married Couples in Germany." CEPR Discussion Paper 1911.

Blau, D., D. B. Gilleskie (1997): "Retiree Health Insurance and the Labor Force Behavior of Older Men in the 1990's," manuscript, University of North Carolina at Chapel Hill.

Blau, D., D. B. Gilleskie and C. Slusher (1997): "The Effect of Health on Employment Transitions of Older Men," manuscript, University of North Carolina at Chapel Hill and Social Security Administration.

Blau, D. (1998): "Labor Force Dynamics of Older Married Couples," *Journal of Labor Economics,* **16-3** 595–629.

Blau, D. (1997): "Social Security and the Labor Supply of Older Married Couples," *Labor Economics,* **4** 373–418.

Blau, D. (1994): "Labor Force Dynamics of Older Men," *Econometrica,* **62** 117–156.

Bound, J., M. Schoenbaum., T. Stinebrickner, and T. Waidmann (1998): "Modeling the Effects of Health on Retirement," Draft presented at the NBER Aging & Health Care Summer Institute, July, 1998

Bound, J., M. Schoenbaum., T. Stinebrickner, and T. Waidmann (1997): "Measuring the Effects of Health on Retirement Behavior," Draft presented at the "Economics of Aging: International Health and Retirement Survey Conference," Amsterdam, August 7-8, 1997.

Coile, C., and J. Gruber (1999): "Social Security, Private Pensions, and Retirement," manuscript, Massachusetts Institute of Technology.

Coile, C. (1999): "Social Security, Pensions, and the Retirement Decisions of Couples," manu-script, NBER.

Costa, D. L. (1999): " The Rise of Joint Retirement, 1940-1998," manuscript, Massachusetts Institute of Technology.

Currie, J and B.C. Madrian (1998): "Health, Health Insurance and the Labor Market," forthcoming in *The Handbook of Labor Economics,* Orley Ashenfelter and David Card, eds.

Flinn, C. J., and J. J. Heckman (1983): "Are Unemployment and Out of the Labor Force Behaviorally Distinct Labor Force States?" *Journal of Labor Economics,* **1-1** 28–42.

Flippen, C., and M. Tienda (1996): "Labor Force Behavior of Hispanic elderly, insights from HRS," Working Paper 96-032. HRS web page.

Friedberg, L. (1999a): "The impact of Technological Change on Older Workers: Evidence from Data on Computers," University of California, San Diego, Discussion Paper No. 99-11.

Friedberg, L. (1999b): "The Trend Towards Part-Time Work Among Older Workers," University of California, San Diego.

Greene, W.H (1993): *Econometric Analysis,* Second Edition, Prentice Hall, New Jersey.

Gustman, A. L., O. Mitchell, and T.L. Steinmeier (1994): "Retirement Research Using the Health and Retirement Survey," NBER Working Paper No. 4813.

Gustman, A. L., O. Mitchell, and T.L. Steinmeier (1995): "Retirement Measures in the Health and Retirement Study," *The Journal of Human Resources* **30** (Supplement).

Heckman, J.J. (1978): "Dummy Endogenous Variables in a Simultaneous Equation System," *Econometrica,* **46** 931–959.

HRS web page: www.umich.edu/˜ hrswww/

Hurd, M. (1990a): "The joint Retirement Decision of Husbands and Wives," in David A. Wise (ed), *Issues in the Economics of Aging,* Chicago, University of Chicago Press for the National Bureau of Economic Research.

Hurd, M. (1990b): "Research on the Elderly: Economic Status, Retirement, and Consumption and Saving," *Journal of Economic Literature,* **28** 565–637.

Hurd, M., and K. McGarry (1993): "The Relationship Between Job Characteristics and Retirement," NBER Working Paper No. 4558.

Juster, T.F., and R. Suzman (1995): "An Overview of the Health and Retirement Study," *The Journal of Human Resources,* **30** (Supplement): S7–S56.

Karoly, L., and J. Rogowski (1997): "Health Insurance and Labor Market Transitions of Older Workers," RAND Working Paper.

Kiefer, N.M (1982): "Testing for Dependence in multivariate probit models," *Biometrika,* **69** 161-166.

Lumsdaine, R. (1995): "Factors Affecting Labor Supply Decisions and Retirement Income," NBER Working Paper No. 5223.

Lumsdaine, R., J. Stock and D. A. Wise (1992): "Three Models of Retirement: Computational Complexity vs. Predictive Validity," In *Topics in the Economics of Aging,* D. A. Wise, ed. Chicago: University of Chicago Press.

Lumsdaine, R. and O. Mitchell (1998): "New Developments in the Economic Analysis of Retirement," forthcoming in *The Handbook of Labor Economics*, Orley Ashenfelter and David Card, eds.

Peracchi, F., and F. Welch (1994): "Trends in Labor Force Transitions of Older Men and Women," *Journal of Labor Economics* **12-2** 210–242.

Pozzebon, S. and O. S. Mitchell (1989); "Married women's retirement behavior," *Journal of Population Economics* 2, 39-53.

Quinn, J., and R. Burkhauser (1994): "Retirement and Labor Force Behavior of the Elderly," In *Demography of Aging,* National Research Council, National Academy Press, Washington D.C.

Quinn, J. (1998): "Retirement Patterns and Bridge Jobs in the 1990's." manuscript, Boston College.

Rogowski, J. and L. Karoly (1997): "Health Insurance and Retirement Behavior: Evidence from the Health and Retirement Survey," RAND.

Ruhm, C.J, (1996): "Historical Trends and the Future of Older Americans," in *The Handbook on Employment and the Elderly*, William H. Crown, ed. Greenwood.

Rust, J. (1989): "A Dynamic Programming Model of Retirement Behavior," in David A. Wise (ed), *Economics of Aging*, Chicago, University of Chicago Press for the National Bureau of Economic Research.

Rust, J. (1990): "Behavior of Male Workers at the end of the Life Cycle: An Empirical Analysis of States and Controls," in David A. Wise (ed), *Issues in the Economics of Aging*, Chicago, University of Chicago Press for the National Bureau of Economic Research.

Rust, J. (1997) with C. Phelan: "How Social Security and Medicare Affect Retirement Behavior in a World of Incomplete Markets," *Econometrica*, **65** 781–831.

Schulz, J. H. (1995): *The Economics of Aging*, Auburn House, sixth edition.

Stevens, A. H. (1997a): "Persistent Effects of Job Displacement: The importance of Multiple Job Losses". *Journal of Labor Economics*, **15** 165–188.

Stevens, A. H. (1997b): "Changes in Earnings Instability and Job Loss," manuscript, Yale University.