

Richard V. Burkhauser, J.S. Butler, and Gulcin Gumus, “Dynamic Programming Model Estimates of Social Security Disability Insurance Application Timing,” *Journal of Applied Econometrics*.

The data used in this paper (“HRS”) are from The Health and Retirement Study: A Longitudinal Study of Health, Retirement, and Aging Sponsored by the National Institute on Aging, available only from the Institute for Social Research (ISR) of the University of Michigan. Most of the data are public use and are available from a website, <http://hrsonline.isr.umich.edu/>, but access to some of the data, namely the Social Security income records and state of residence, is restricted and can be obtained under certain conditions from the HRS staff at the Institute for Social Research (ISR) at the University of Michigan.

See <http://www.umich.edu/~hrswww/> for more information concerning restricted data.

The data on initial acceptance rates in the Social Security Disability Insurance program are available only from the Lewin Group. See Lewin Group (1995): Labor Economic Conditions, Socio-economic Factors, and the Growth of Applicants and Awards for SSDI and SSI Disability Benefits. Fairfax, VA: Lewin Group. Those data cannot be used without knowing the state of residence, which is restricted access data in the HRS.

The rest of this memo is the document “Data Appendix to Dynamic Programming Model Estimates of Social Security Disability Insurance Application Timing” by Gulcin Gumus, which explains the derivation and estimation of data including estimated earnings in detail.

## **Data Appendix to Dynamic Programming Model Estimates of Social Security Disability Insurance Application Timing**

This appendix provides information on the data sets used and a discussion of the data issues and construction methods of the variables used in the analysis. The programs used for creating the data are available upon request.

### ***Health and Retirement Study***

The study is based on data from the first three waves of the Health and Retirement Study (HRS). The HRS is a longitudinal study that focuses on persons aged 51-61 in 1992 and their households. The spouses or partners of these primary respondents were also interviewed regardless of their year of birth. The respondents born between the years of 1931 and 1941 (aged 51-61 in 1992) are considered “age eligible” and the rest are “age ineligible”. Individuals were interviewed biennially and five waves of data are currently available, but only three are in final form.<sup>1</sup>

The HRS is an excellent source of data for analyzing policy issues related to Social Security Disability Insurance (SSDI). It includes a separate section on disability with detailed questions about SSDI applications and awards. Data on the respondents’ demographics, labor force participation, employment, and health status are also available in separately designed sections. The income section provides data on benefits, income, and wealth holdings.

However, the data also has some shortcomings for modeling the SSDI application decision. One of the most important limitations of the HRS survey is that respondents were asked whether they applied for disability benefits from the SSDI or Supplemental Security Income

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<sup>1</sup> Early versions of Waves 4 and 5 of HRS data are available but they were not sufficiently cleared for our purposes. For a detailed overview of the HRS, see Juster and Suzman (1995).

(SSI) program without distinguishing between the two. The implications of this problem and other data issues are discussed below.

### *SSA Administrative Files*

HRS data can be linked to restricted access SSA administrative data. These data are linked to the HRS files of respondents who signed a valid consent form. This is a very valuable source of data since it allows researchers to determine respondents' eligibility status and compute their disability benefits over time. These restricted access records can be obtained under certain conditions from the HRS staff at the Institute for Social Research (ISR) at the University of Michigan.<sup>2</sup> Three restricted access files are used in this study.

### *HRS Covered Earnings*

This file provides earnings history data on consenting respondents' Social Security covered jobs for 1951-1991. It contains annual quarters of coverage and annual covered earnings (wages or self-employment income earned from a job on which Social Security taxes are paid) up to the maximum taxable Social Security earnings limit. The file also contains summary information for taxable earnings amounts for 1937-1950 and total quarters of coverage for 1947-1950. Version 3 of the Covered Earnings file was used in this study. These data were used to estimate earnings profile predictions, Social Security benefits, and SSDI eligibility status.

### *Summary of Earnings and Projected Benefits (SEPB)*

This file includes summary earnings and employment measures over consenting respondents' earnings histories, a disability insurance receipt status indicator for 1991 and

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<sup>2</sup> See <http://www.umich.edu/~hrswww> for more information.

projections of Social Security benefits at certain ages.<sup>3</sup> These data were created using the annual covered earnings data described above. Version 2.2 of the SEPB file was used in this study.

#### *Wage and Self-Employment Income in Covered and Non-Covered Jobs*

This file contains wages and self-employment income (non-topcoded) for each year from 1980 through 1991 for each consenting respondent of the HRS. Version 1.1 of these data are used to obtain predictions of wages in non-covered jobs.

#### *Additional sources of data*

The Lewin Group created a Public Use File which includes state level data on SSDI and SSI programs as well as state level descriptive variables for the years 1974 through 1993. The data contain initial SSDI allowance rates for each state computed as the total number of people awarded SSDI benefits at the initial state level screening process divided by the total number of initial SSDI applications in that state. These data are used to form the probabilities of acceptance for SSDI application.

The restricted HRS data set Wave 1 Geographic Indicators Version 1.0 file provides state geographic identifier variables from HRS Wave 1, including information on Wave 1 state of residence and state or country of birth. These variables are masked in the public HRS files. We merged geographic regions rather than individual states with the Lewin Group Public Use File on allowance rates because one cannot merge any other restricted data with the geographic state identifier variables without permission.

In our study, we need data on probabilities of death for disabled individuals and for this purpose we use life table data provided in Zayatz (1999). These life tables are derived from SSA

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<sup>3</sup> For a more detailed description of the constructed variables contained in this file, see Mitchell, Olson, and Steinmeier (2000).

records separately for men and women. The probabilities depend on the age at the onset of disability and on the duration of the condition.

### ***Sample Development***

We draw our sample from both age eligible and age ineligible persons who reported disability in Wave 1 (1992) and Wave 2 (1994) of the HRS as defined by a positive response to the question “Do you have an impairment or health problem that limits the kind or amount of paid work you can do?”. Since the disability section of Wave 3 (1996) cannot as yet be merged to the restricted access data, we do not use third wave disability section to create our sample. We do, however, use data from Wave 3 in our earnings equation.

Appendix Table 1 summarizes how we develop our sample from the total HRS sample. In total 12,652 respondents were interviewed in the first wave. We were interested in following the path of SSDI application following the onset of a disability. The sample is drawn on the basis of self-reports about health conditions. In the first wave, there are 2,717 respondents (1,324 men and 1,393 women) who report that they had a disability. A greater proportion of men report disability than women. The 2,612 of these men and women who say that their condition is not temporary (will last for more than three months) are kept in the sample. Not surprisingly, a smaller proportion of women were employed at onset, reflecting the fact that men tend to work in the market more. So the sample is reduced to 1,694 individuals (993 men and 701 women) who were employed at the onset of their disability. Of these, we excluded those who were self-employed at the time of the onset. This reduced the sample to 1,490 respondents (848 men and 642 women) who were working for someone else at the time of the onset of their disability. This is the portion of our sample that came from the first wave of the HRS.

Next, we consider respondents who did not report having a disability in Wave 1 but did so in Wave 2. There are 340 such respondents who were not in the disabled sample drawn from Wave 1 but who reported having a disability in Wave 2. Of these respondents, 288 said that their condition was not temporary. Of these, 186 (93 men and 93 women) were working at onset. And of these, 163 (76 men and 87 women) were working for someone else at onset. Combining respondents from our Wave 1 sample and our Wave 2 sample, we have a total sample of 1,653 respondents (924 men and 729 women). Of these respondents, 1,387 (750 men and 637 women) remained in the sample once we required that they have all other key information we need to estimate our model. This information includes variables that define: the onset year, SSDI application status, SSDI award status and SSDI application year if there was an application. Respondents with missing data for any of these disability variables are excluded from the analysis.

We then found that some respondents had timing inconsistencies in their responses to date of onset and SSDI application. We established rules to deal with such inconsistencies that are discussed in the sections on disability and income variable definitions. All cases with unsolved date inconsistencies were dropped from the sample. Since early retirement under Social Security is possible at age 62, any individual whose onset was after age 61 was excluded from the analysis. We also exclude any person who became disabled before the year 1950. When this was done, our sample size fell from 1,387 to 1,337 (716 men and 621 women). Finally, only respondents who were eligible for SSDI benefits in at least one period during their disability spell were kept in the final sample. Respondents who became eligible only after 1993 were also dropped since it was not possible to observe them applying for SSDI. SSDI eligibility is determined by computing the SSDI benefits as discussed below. When this final criterion was applied, our final sample consisted of 1,085 respondents (592 men and 493 women).

### *SSA Records*

A major advantage of the HRS data is that it contains covered earnings and social security benefits for its respondents who signed a valid consent form. Appendix Table 2 shows the match with the SSA administrative records. Of all Wave 1 respondents, 75 percent signed a valid consent form for HRS to obtain their SSA earnings histories. As we restrict our sample to the individuals who experienced the onset of a disability, we see that 75 percent of such respondents from the Wave 1 sample and 81 percent from the Wave 2 sample allowed their earnings histories to be obtained. In our final sample, 83 percent of men and 81 percent women have SSA administrative records available.

We included individuals who did not have SSA record values in our study. The absence of an SSA record for a given individual does not necessarily indicate refusal. This may be also due to missing data or problems with the Social Security Number validation process by SSA. We tested for selection bias with respect to whether the consenting respondents differed from those who do not give consent. The inverse of the Mills' ratio in our sample selection equations was insignificant so that the hypothesis of no selection bias cannot be rejected. Therefore, we do not consider selection bias in SSA information in the sample any further. Since labor earnings profiles will be predicted for each individual and these values are critical to identify our model, we need to obtain labor earnings information either from the first three waves of the HRS or from the restricted access SSA records for each of our sample respondents. We were not able to obtain any earnings information for 108 respondents (55 men and 53 women), that is they had missing and/or all zero earning variables for all three waves and no SSA records. For these individuals, we substituted the means of predicted earnings of the respondents for whom SSA records were available but had similar earnings information in the public HRS data.

## *Variable Definitions*

In this section, the construction of the variables we used in our analysis and several other data issues are discussed. All variables were constructed using the information provided in different sections of the HRS survey and the Lewin Group Public Use File. As discussed below, some of these variables were constructed for the earnings prediction equations and some were used in the empirical model of SSDI application. All our analyses are carried out separately for men and women. The Appendix Table 9 provides descriptive statistics by gender for all variables.

Disability Section Variables. In the disability section of HRS, respondents are asked “When did the impairment or health problem you mentioned first begin to bother you?” The year given in response to this question is used as the date of onset.

Onset of Disability: Year in which the condition first began to bother the person.

An alternative date of onset can be defined as the time at which the condition first began to interfere with the person's work. In previous work (Burkhauser, Butler, and Weathers, forthcoming), the difference between these two definitions of onset of a disability was investigated. In most cases, the difference between these two definitions was small, and estimated models were not sensitive to the date chosen. Furthermore, using the year the condition began to bother the person as the starting point for the analysis is more reasonable in analyzing the SSDI application because this is when the planning begins in response to the condition. Therefore, in our study we use the time at which the condition first began to bother as the definition of onset of a disability.

There are some cases with inconsistencies between the onset dates given in the first two waves. When this occurred we assumed that the onset of disability was the earlier date



mentioned. The same rule was applied to the SSDI application date unless it was inconsistent with the onset date.

A tabulation of onset of a disability variable is provided for both men and women in Appendix Table 3. The onset of a disability is relatively more recent for women than men. This is probably because the sample of women is on average younger than the sample of men in any given year. Since disabilities are more likely to occur at older ages, men in our final sample start to report disabilities earlier than do women. Appendix Table 4 shows the age at onset of a disability for both men and women in our sample.

Age at Onset: Respondent's age at the onset of a disability in years (year of onset minus the year of birth).

Respondents who experienced the onset of a work limitation while working were asked whether their employer did anything special to help them to stay at work at the time their health began to limit their ability to work.

Employer Accommodation: 1 if the employer did anything special to help the respondent to stay on the job, 0 else.

Finally, several variables are constructed using detailed information about the individuals' impairment or health condition. The HRS respondents were asked "What health condition causes the impairment or problem?" if they reported having a disability. If they mentioned more than one condition, they were asked to report the main cause of the impairment or problem. Respondents mentioned up to three conditions that caused the condition. We define two dummy variables using the number of listed health conditions causing the impairment mentioned.

Two Conditions: 1 if person reports two health conditions at the onset of a disability, 0 else.

Three Conditions: 1 if person reports three health conditions at the onset of a disability, 0 else.

The types of health conditions were classified under the following groups: cancers and tumors, skin conditions; musculoskeletal system and connective tissue conditions including arthritis and paralysis; heart, circulatory and blood conditions; respiratory system conditions; endocrine, metabolic and nutritional conditions; digestive system conditions; neurological and sensory conditions; reproductive system and prostate conditions; emotional and psychological conditions; miscellaneous.

We formed dummies for the following broad categories to indicate the type of health condition.

Arthritis: 1 if the respondent's type of condition is listed under arthritis, rheumatism, or bursitis, 0 else.

Musculoskeletal conditions: 1 if the respondent's type of condition is listed under musculoskeletal system or connective tissue conditions excluding arthritis, rheumatism, and bursitis, and including paralysis, 0 else.

Cardiovascular conditions: 1 if the respondent's type of condition is listed under Heart, circulatory and blood conditions, 0 else.

Other health conditions: 1 if the respondent's type of condition is not listed under the three broad categories listed above, 0 else.

SSDI Application and Outcome Variables. Respondents were asked if they have ever applied for disability benefits from the SSDI program or the SSI program.

SSDI application status: 1 if the respondent has applied for SSDI, 0 else.

In some cases, using the benefit computations the individual was identified as SSDI ineligible even if the respondent said that he/she applied for SSDI. In those cases, we assumed

that the respondent must have applied for benefits from SSI program rather than from the SSDI program and the SSDI application status was changed to 0.

If the answer to the SSDI application question is positive, next they were asked the earliest date of application.

SSDI application year: Year of application for SSDI (last two digits).

Appendix Table 5 summarizes the year of SSDI application for the individuals who applied for SSDI benefits in our final sample. The last row shows that 59 percent of men and 53 percent of women applied for benefits before the Wave 2 interview was conducted.

Next, we define spell length as the time lag between the year of first eligibility and the year of SSDI application. This variable is defined as 1994 minus year of first eligibility for individuals who did not apply for SSDI by the date of the Wave 2 interview. Eligibility is determined by computing the potential SSDI benefits.

Spell length: Year of application for SSDI or 1994, if there is no application, minus year of first eligibility.

The next question in the disability section of the HRS is “whether the respondent was awarded SSDI benefits as a result or not.” However, this piece of information is hard to use because this part of the HRS survey does not distinguish between SSDI and SSI. These two programs have the same disability selection criteria but they differ in terms of eligibility. To be eligible for SSDI benefits, one must be fully insured, whereas SSI is means-tested. An individual may qualify for both SSI and SSDI benefits. The computed benefit amounts are used to find out about the eligibility status for SSDI. We assumed that respondents who are eligible for SSDI have applied for SSDI. Note that in some cases respondents may have applied for both. But it is always in the interest of respondents to apply for SSDI if they are eligible.

In order to identify benefit award status and to clarify benefit application status, information from the income section was used as explained below.

Income Section Variables. SSDI award status is determined using the income section of the HRS survey rather than the disability section for the reasons explained above. Since the respondents were interviewed every other year, the period of analysis in our study is defined as biennial periods. Financial questions in the income section of the survey were only answered by the financial respondent of the household, and all income section variables are created by attaching these data to all other members of the household. Earnings in the first three waves are constructed as the sum of the following four components:

- wage or salary income from working on any job,
- any bonuses, overtime, tips, or commissions
- income from a professional practice or trade
- any other income from work

For individuals with no SSA records who also have missing earnings values in either Wave 1, Wave 2, or Wave 3, the missing value is replaced by the mean of earnings from the other non-missing waves as long as they have positive earnings recorded in some wave.

Both in Wave 1 and Wave 2, the financial respondent was asked whether individuals in the household have received disability benefits from the SSDI program.

SSDI award status: 1 if the respondent received disability benefits from the SSDI program, 0 else.

If the SSDI benefit receipt information was missing for both waves, then the disability insurance receipt status indicator for 1991 from SEPB data was used. There were some cases in which the respondent was identified as an SSDI benefit recipient even though his SSDI application status

was coded as 0. In these cases, the application status was changed to 1 if the respondent was identified as SSDI eligible.

Once the SSDI application and award status are determined for each individual, the respondents are divided into three groups and three time-varying dummy variables are created to identify their group for each period. These dummy variables are used in the earnings predictions since we need to predict separate earnings profiles for each individual in three different states of the world: “no application”, “applied and rejected”, and “applied and accepted”. Respondents who are in the applied and accepted group were assumed to stay in this group. Appendix Table 6 provides a summary of these groups for Wave 1 and Wave 2 only. In the Wave 1 interview, 282 men had never applied. By Wave 2, 245 had still had not applied. However, of these 37 had applied sometime between the first and the second wave and 21 of these 37 men were defined as applied and rejected in Wave 2 since the income section variables indicated no receipt of SSDI benefits. The other 16 were defined as SSDI recipients and switched to the applied and accepted group in the second wave.

Health Section Variables. HRS data include several indicators of general physical/mental health status and functional activity limitations. Three dummies are constructed as general indicators of poor physical/mental health status in Wave 1.

General health poor: 1 if respondent rates his general health status “fair” or “poor”, 0 else.

Health status worsened: 1 if respondent says his health is “somewhat worse” or “much worse” compared to one year ago, 0 else.

Emotional health poor: 1 if respondent rates his emotional health status “fair” or “poor”, 0 else.

The functional activity limitations include respondents' ability to perform some sensory and physical functions and several Activities of Daily Living (ADLs). The respondents were asked to indicate whether and to what degree they had difficulty performing the following

physical activities: run or jog about a mile; walk several blocks; walk one block; walk across a room; sit for about 2 hours; get up from a chair after sitting for long periods; get in and out of bed without help; climb several flights of stairs without resting; climb one flight of stairs without resting; lift or carry weights over 10 pounds; stoop, kneel, or crouch; pick up a dime from a table; bathe or shower without help; reach or extend your arms above shoulder level; pull or push large objects; eat without help; dress without help.

The responses about the physical functions are given as categories, and these categories were rescaled in the following way. A dummy variable for not being able to perform any ADL was coded as 1 if the individual responds “don't do” or “very difficult/can't do” or “somewhat difficult”, all other responses were coded as 0.

The questions related to smoking were used to form two more dummies for indicating general health status.

Has never smoked: 1 if the respondent says he never smoked, 0 else.

Smoking now: 1 if the respondent says he is smoking now, 0 else.

Employment Section Variables. Dummy variables for the occupation of jobs held at the onset of disability were constructed as follows:

Manager: 1 if the official title of the job held at the onset of a disability is listed as managerial specialty operation, 0 else.

Professional: 1 if the official title of the job held at the onset of a disability is listed as professional specialty operation and technical support, 0 else.

Sales: 1 if the official title of the job held at the onset of a disability is listed as sales, 0 else.

Clerical: 1 if the official title of the job held at the onset of a disability is listed as clerical or administrative support, 0 else.

Service: 1 if the official title of the job held at the onset of a disability is listed as private household, cleaning and building services or protection services or food preparation services or health services, personal services, 0 else.

Craftsperson: 1 if the official title of the job held at the onset of a disability is listed as farming, forestry, fishing, or mechanics and repair, or construction trade and extractors, or precision production, 0 else.

Laborer: 1 if the official title of the job held at the onset of a disability is listed as machine operators, or transport operators, or handlers, etc., 0 else.

Military: 1 if the respondent was a member of the Armed Forces at the onset of a disability, 0 else.

Occupation missing: 1 if the occupation information is missing, 0 else.

White collar: 1 if the occupation at the onset of a disability is manager or professional, 0 else.

Dummy variables for the industry of jobs held at the onset of a disability are listed below:

Agriculture: 1 if the industry of the job held at the onset of a disability is listed as Agriculture, Forestry, Fishing, 0 else.

Mining: 1 if the industry of the job held at the onset of a disability is listed as Mining and Construction, 0 else.

Manufacturing: 1 if the industry of the job held at the onset of a disability is listed as Non-durable or Durable Manufacturing, 0 else.

Transportation: 1 if the industry of the job held at the onset of a disability is listed as Transportation, 0 else.

Retail-Wholesale-Finance: 1 if the industry of the job held at the onset of a disability is listed as Wholesale, or Retail, or Finance, Insurance, and Real Estate, 0 else.

Service: 1 if the industry of the job held at the onset of a disability is listed as Business and Repair Services, or Personal Services, or Entertainment and Recreation, 0 else.

Professional Service: 1 if the industry of the job held at the onset of a disability is listed as Professional and Related Services, 0 else.

Public administration: 1 if the industry of the job held at the onset of a disability is listed as Public Administration, 0 else.

Industry missing: 1 if the industry information is missing, 0 else.

Demographic Measures. Education: Educational attainment in years of formal schooling.

There are three categories for race.

White: 1 if the respondent is White/Caucasian, 0 else.

Black: 1 if the respondent is Black/African American, 0 else.

Other Race: 1 if respondent is not white or black, 0 else.

SSA records available: 1 if the respondent signed a valid consent form for his/her SSA administrative records to be used, 0 else.

Marital status at the onset of a disability was available for the respondents in the disabled sample in Wave 1 only, since this question was not asked in the Wave 2 interview. Because respondents coming from the Wave 2 sample all experienced the onset of their disability after the first wave, current marital status was used for them.

Marital status: 1 if respondent was married or lived with a partner at the onset of a disability.

Regional dummies are created for regions of residence of respondents in the first wave.

Northeast: 1 if the region of residence is Northeast Region, i.e. New England Division (ME, NH, VT, MA, RI, CT) or Middle Atlantic Division (NY, NJ, PA), 0 else.

Midwest: 1 if the region of residence is Midwest Region, i.e. East North Central Division (OH, IN, IL, MI, WI) or West North Central Division (MN, IA, MO, ND, SD, NE, KS), 0 else.



South: 1 if the region of residence is South Region, i.e. South Atlantic Division (DE, MD, DC, VA, WV, NC, SC, GA, FL) or East South Central Division (KY, TN, AL, MS) or West South Central Division (AR, LA, OK, TX), 0 else.

West: 1 if the region of residence is West Region, i.e. Mountain Division (MT, ID, WY, CO, NM, AZ, UT, NV) or Pacific Division (WA, OR, CA, AK, HI), 0 else.

State Level Variables. We use the Lewin Group data to obtain state unemployment rates and initial state allowance rates for 1974 through 1993. Initial allowance rates are used in the final analysis and the unemployment rate is used in earnings prediction. For the years with no allowance rate or unemployment rate information, the overall means are substituted. The overall mean of the allowance rate is 39 percent and the overall mean of the unemployment rate is 7 percent.

### ***Expected Labor Earnings Profiles***

Expected labor earnings are intended to capture the opportunity cost of applying for or receiving benefits. We need to predict labor earnings profiles for each individual for three different states of the world. In this section, we explain the methods of constructing expected labor earnings profiles for these three states: “no application”, “applied and rejected”, and “applied and accepted”. It should be noted that the aim here is to get good labor earnings predictions rather than estimating a structural model of lifetime labor earnings. All dollar amounts are converted into 1967 dollars.

First, we define total labor earnings as the sum of covered earnings and non-covered wages. This causes a problem since non-covered wage values are only available for respondents with SSA records from 1980 to 1991. In order to predict non-covered wages for the rest of our sample, a Tobit regression was estimated for each year between 1980-1991. This regression

includes all the health section, employment section, disability section and the demographic variables defined above. Non-covered wage values are unavailable for any other year. To obtain predictions for all other years in our analysis, we use an inflation correction.<sup>4</sup>

The other component of total labor earnings is covered earnings. Covered earnings in the SSA data are topcoded at the Social Security taxable maximum level. For each year a separate earnings distribution of log-normal form is fitted in order to obtain expected values of earnings given that the individual's covered earnings were at the taxable maximum. Maximum earnings values are then replaced by these estimated values.

Once the predictions for covered earnings and non-covered wages are obtained, an autoregression was used to construct expected earnings profiles for the three states: “no application”, “applied and rejected”, and “applied and accepted”. This is done using the dummy variables constructed to identify the SSDI application and award status. We run two separate autoregressions of earnings using the non-zero earnings only. The results can be found in Appendix Tables 7A and 7B. Table 7A values are obtained for men and women by regressing the logarithm of earnings in period  $t$  on the logarithm of earnings in periods  $t+1$ ,  $t+2$ ,  $t+3$ , and  $t+4$ . This regression also includes a dummy for having a disability in period  $t$ ; interaction of disability dummies with logarithm of earnings for periods  $t+1$ ,  $t+2$ ,  $t+3$ , and  $t+4$ ; spell length defined as the time lag between period  $t$  and the onset year; dummies for being in “applied and rejected” or “applied and accepted” group; and age and age square at period  $t$ . Table 7B values are obtained for men and women by regressing the logarithm of earnings in period  $t+4$  on the logarithm of earnings in periods  $t+3$ ,  $t+2$ ,  $t+1$ , and  $t$ . This regression also includes a dummy for having a disability in period  $t$ ; interaction of disability dummies with logarithm of earnings for periods  $t+3$ ,  $t+2$ ,  $t+1$ , and  $t$ ; spell length defined as the time lag

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<sup>4</sup> The inflation figures were formed using the Consumer Price Index defined as Urban Wage Earners and Clerical Workers, obtained from Bureau of Labor Statistics.

between period  $t$  and the onset year; dummies for being in “applied and rejected” or “applied and accepted” group; and age and age square at period  $t$ .

Next, earnings predictions in a given year and a state are constructed using the parameters obtained from the autoregressions. A probit equation is then estimated to obtain the predicted probabilities of having zero earnings. Final prediction of earnings is done by incorporating the predicted values of covered wages from the autoregression, the probit, and the predicted values of the non-covered wages. Standard deviations of the predicted earnings are also computed.

Earnings estimation for individuals with no SSA records is done in the same way, except that the self-reported job earnings values from the first three waves of the HRS are used instead of the restricted earnings histories.

### ***Expected SSDI Benefits***

SSDI benefits are determined using the individuals’ average indexed monthly earnings (AIME), which is a function of covered earnings. Details of the SSDI benefit computation rules can be found in the *Annual Statistical Supplement to the Social Security Bulletin*.<sup>5</sup> AIME is used to determine the monthly benefit amount which is called the Primary Insurance Amount (PIA). Both PIA and AIME formulae are determined annually by SSA. In our empirical model, we need to project SSDI benefit rules for years after 2000. We construct these rules following the SSA’s benefit rules and projections.<sup>6</sup>

Exact potential benefit variables can be constructed for individuals with SSA records using their earnings histories. We use the actual earnings records whenever available and before the year of benefit computation and then the predicted earnings in the no application state after

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*The Annual Statistical Supplement* includes the most comprehensive data available on the Social Security and Supplemental Security Income programs. It includes summaries of the history of the major programs and of current legislative developments and a glossary of terms used in explaining the programs and data.

<sup>6</sup>

The SSA projections can be found in Board of Trustees (2001).

the year of benefit computation. For individuals with no SSA records, only predicted earnings in the no application state are used to determine eligibility and the amount of benefits.

A PIA computation is done for every individual and for every period of the analysis. Annual benefits are computed by multiplying the PIA by 12. The computed potential SSDI benefits are used to identify the SSDI eligible individuals in the HRS data. As mentioned above, individuals not eligible in at least one period are excluded from the analysis. For the rest of the individuals, the periods after onset but prior to eligibility are not included in the analysis. The spell for each respondent starts with the first period of eligibility for SSDI benefits and for every individual, the spell ends before the early retirement age of 62. Expected monthly SSDI benefits are summarized in Appendix Table 8A for men and in Appendix Table 8B for women.

### ***Certainty Equivalents***

The certainty equivalent is calculated as the amount of money for which the individual is indifferent between the gamble and the certain amount, holding everything else constant. In Appendix Table 10, we consider an even probability gamble between \$10,000 and \$20,000. The certainty equivalent of this gamble can be calculated for each set of results given in Table 3 and 4. Note that these numbers are calculated holding everything else constant. Since the certainty equivalents are very close to the expected amount, we conclude that the individuals are essentially risk neutral, even though the estimated  $\gamma$  takes a wide range of values.

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## Data Appendix Tables

**Appendix Table 1: Creation of Sample Used in Analysis from Entire HRS Data**

	Men	Women	Total
All respondents in Wave 1	5,867	6,785	12,652
From Wave 1			
Disabled	1,324	1,393	2,717
Condition not temporary	1,280	1,332	2,612
Working at onset	993	701	1,694
Working for someone else at onset	848	642	1,490
From Wave 2			
Disabled	140	200	340
Condition not temporary	122	166	288
Working at onset	93	93	186
Working for someone else at onset	76	87	163
TOTAL	924	729	1,653
Onset and SSDI application information available	750	637	1,387
Onset after year 1950 and before age 61	716	621	1,337
SSDI Eligible	592	493	1,085
Final Sample	592	493	1,085

Source: Author's calculations using HRS data.

**Appendix Table 2: SSA Administrative Records**

Sample	Men	Women	Total
All Respondents in Wave 1	5,867	6,785	12,652
SSA Records Available	4,328	5,144	9,472
Percent of Total	74%	76%	75%
Disabled in Wave 1	1,324	1,393	2,717
SSA Records Available	979	1,060	2,039
Percent of Total	74%	76%	75%
Disabled in Wave 2	140	200	340
SSA Records Available	114	161	275
Percent of Total	81%	81%	81%
Final Sample	592	493	1,085
SSA Records Available	493	397	890
Percent of Total	83%	81%	82%

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Source: Author's calculations using HRS data.

**Appendix Table 3: Year of Onset of Disability**

Year of Onset	MEN			WOMEN		
	Frequency	Percentage	Cumulative Percentage	Frequency	Percentage	Cumulative Percentage
1954	2	0.34	0.34	1	0.20	0.20
1955	3	0.51	0.84	0	0.00	0.20
1956	0	0.00	0.84	0	0.00	0.20
1957	3	0.51	1.35	1	0.20	0.41
1958	0	0.00	1.35	1	0.20	0.61
1959	5	0.84	2.20	3	0.61	1.22
1960	9	1.52	3.72	1	0.20	1.42
1961	7	1.18	4.90	2	0.41	1.83
1962	2	0.34	5.24	1	0.20	2.03
1963	6	1.01	6.25	2	0.41	2.43
1964	5	0.84	7.09	4	0.81	3.25
1965	13	2.20	9.29	6	1.22	4.46
1966	2	0.34	9.63	4	0.81	5.27
1967	11	1.86	11.49	5	1.01	6.29
1968	9	1.52	13.01	9	1.83	8.11
1969	8	1.35	14.36	4	0.81	8.92
1970	17	2.87	17.23	7	1.42	10.34
1971	12	2.03	19.26	5	1.01	11.36
1972	20	3.38	22.64	15	3.04	14.40
1973	12	2.03	24.66	7	1.42	15.82
1974	16	2.70	27.36	11	2.23	18.05
1975	23	3.89	31.25	14	2.84	20.89
1976	17	2.87	34.12	11	2.23	23.12
1977	18	3.04	37.16	7	1.42	24.54
1978	16	2.70	39.86	14	2.84	27.38
1979	19	3.21	43.07	11	2.23	29.61
1980	29	4.90	47.97	19	3.85	33.47
1981	14	2.36	50.34	19	3.85	37.32
1982	20	3.38	53.72	18	3.65	40.97
1983	16	2.70	56.42	27	5.48	46.45
1984	23	3.89	60.30	19	3.85	50.30
1985	34	5.74	66.05	25	5.07	55.38
1986	26	4.39	70.44	25	5.07	60.45
1987	22	3.72	74.16	31	6.29	66.73
1988	29	4.90	79.05	22	4.46	71.20
1989	25	4.22	83.28	30	6.09	77.28
1990	28	4.73	88.01	35	7.10	84.38
1991	27	4.56	92.57	28	5.68	90.06
1992	14	2.36	94.93	22	4.46	94.52
1993	30	5.07	100.00	27	5.48	100.00
Total		592			493	

Source: Author's calculations using HRS data.



**Appendix Table 4: Age of Onset of Disability**

Age of Onset	MEN			WOMEN		
	Frequency	Percentage	Cumulative Percentage	Frequency	Percentage	Cumulative Percentage
17	1	0.17	0.17	1	0.20	0.20
18	0	0.00	0.17	1	0.20	0.41
19	0	0.00	0.17	2	0.41	0.81
20	1	0.17	0.34	1	0.20	1.01
21	1	0.17	0.51	0	0.00	1.01
22	4	0.68	1.18	0	0.00	1.01
23	4	0.68	1.86	4	0.81	1.83
24	3	0.51	2.36	2	0.41	2.23
25	10	1.69	4.05	3	0.61	2.84
26	2	0.34	4.39	3	0.61	3.45
27	4	0.68	5.07	5	1.01	4.46
28	5	0.84	5.91	4	0.81	5.27
29	7	1.18	7.09	2	0.41	5.68
30	3	0.51	7.60	7	1.42	7.10
31	15	2.53	10.14	3	0.61	7.71
32	9	1.52	11.66	5	1.01	8.72
33	15	2.53	14.19	7	1.42	10.14
34	13	2.20	16.39	12	2.43	12.58
35	12	2.03	18.41	9	1.83	14.40
36	18	3.04	21.45	16	3.25	17.65
37	9	1.52	22.97	11	2.23	19.88
38	11	1.86	24.83	16	3.25	23.12
39	14	2.36	27.20	13	2.64	25.76
40	19	3.21	30.41	8	1.62	27.38
41	15	2.53	32.94	17	3.45	30.83
42	17	2.87	35.81	19	3.85	34.69
43	12	2.03	37.84	12	2.43	37.12
44	18	3.04	40.88	26	5.27	42.39
45	19	3.21	44.09	20	4.06	46.45
46	23	3.89	47.97	20	4.06	50.51
47	20	3.38	51.35	22	4.46	54.97
48	23	3.89	55.24	24	4.87	59.84
49	31	5.24	60.47	19	3.85	63.69
50	21	3.55	64.02	24	4.87	68.56
51	28	4.73	68.75	23	4.67	73.23
52	30	5.07	73.82	21	4.26	77.48
53	24	4.05	77.87	19	3.85	81.34
54	18	3.04	80.91	24	4.87	86.21
55	22	3.72	84.63	16	3.25	89.45
56	22	3.72	88.34	12	2.43	91.89
57	21	3.55	91.89	9	1.83	93.71
58	20	3.38	95.27	10	2.03	95.74
59	11	1.86	97.13	12	2.43	98.17
60	15	2.53	99.66	4	0.81	98.99
61	2	0.34	100.00	5	1.01	100.00
Total		592			493	

Source: Author's calculations using HRS data.

**Appendix Table 5: Year of SSDI Application**

Year of Application	MEN			WOMEN		
	Frequency	Percentage	Cumulative Percentage	Frequency	Percentage	Cumulative Percentage
1965	1	0.17	0.17	0	0.00	0.00
1966	0	0.00	0.17	1	0.20	0.20
1967	1	0.17	0.34	1	0.20	0.41
1968	0	0.00	0.34	2	0.41	0.81
1969	4	0.68	1.01	1	0.20	1.01
1970	0	0.00	1.01	1	0.20	1.22
1971	7	1.18	2.20	0	0.00	1.22
1972	3	0.51	2.70	0	0.00	1.22
1973	7	1.18	3.89	3	0.61	1.83
1974	4	0.68	4.56	3	0.61	2.43
1975	9	1.52	6.08	5	1.01	3.45
1976	3	0.51	6.59	2	0.41	3.85
1977	15	2.53	9.12	7	1.42	5.27
1978	5	0.84	9.97	4	0.81	6.09
1979	5	0.84	10.81	4	0.81	6.90
1980	7	1.18	11.99	1	0.20	7.10
1981	14	2.36	14.36	7	1.42	8.52
1982	8	1.35	15.71	6	1.22	9.74
1983	21	3.55	19.26	10	2.03	11.76
1984	12	2.03	21.28	6	1.22	12.98
1985	21	3.55	24.83	21	4.26	17.24
1986	19	3.21	28.04	7	1.42	18.66
1987	28	4.73	32.77	13	2.64	21.30
1988	11	1.86	34.63	11	2.23	23.53
1989	28	4.73	39.36	18	3.65	27.18
1990	17	2.87	42.23	21	4.26	31.44
1991	42	7.09	49.32	36	7.30	38.74
1992	23	3.89	53.21	26	5.27	44.02
1993	28	4.73	57.94	37	7.51	51.52
1994	4	0.68	58.61	9	1.83	53.35
No Application	245	41.39	100.00	230	46.65	100.00
Total		592			493	

Source: Author's calculations using HRS data.

**Appendix Table 6: SSDI Application and Award Status in Wave 1 (1991) and Wave 2 (1993)**

MEN

Wave 1 1991	Wave 2 1993	No Application	Applied & Rejected	Applied & Accepted	TOTAL
No Application		245	21	16	282
Applied & Rejected		0	98	0	98
Applied & Accepted		0	0	212	212
		245	119	228	592
TOTAL					

WOMEN

Wave 1 1991	Wave 2 1993	No Application	Applied & Rejected	Applied & Accepted	TOTAL
No Application		230	26	13	269
Applied & Rejected		0	79	0	79
Applied & Accepted		0	0	145	145
		230	105	158	493
TOTAL					

Source: Author's calculations using HRS data.

**Appendix Table 7A: Backcasting Autoregression Used for Earnings Predictions for Men and Women**

Dependent variable: log earnings (t)	MEN				WOMEN			
	Estimate	Std. Err.	T-Value	P-Value	Estimate	Std. Err.	T-Value	P-Value
Intercept	-1.312	0.164	-7.980	0.000	-0.063	0.318	-0.200	0.842
Log of earnings (t+1)	0.459	0.015	30.890	0.000	0.476	0.023	21.090	0.000
Log of earnings (t+2)	0.190	0.017	11.350	0.000	0.113	0.025	4.460	0.000
Log of earnings (t+3)	0.066	0.017	3.950	0.000	0.035	0.025	1.390	0.165
Log of earnings (t+4)	0.048	0.013	3.720	0.000	0.085	0.021	4.050	0.000
Disability (t)	-0.032	0.074	-0.440	0.661	0.077	0.125	0.610	0.541
Disability (t+1)*log earnings (t+1)	-0.007	0.009	-0.850	0.394	-0.019	0.016	-1.200	0.232
Disability (t+2)*log earnings (t+2)	0.014	0.008	1.750	0.080	0.016	0.014	1.150	0.249
Disability (t+3)*log earnings (t+3)	0.011	0.007	1.580	0.114	-0.005	0.012	-0.390	0.696
Disability (t+4)*log earnings (t+4)	-0.006	0.005	-1.160	0.248	0.007	0.008	0.820	0.411
Spell length	0.005	0.005	0.940	0.347	0.003	0.009	0.310	0.755
Applied & Rejected <sup>a</sup>	-0.372	0.149	-2.500	0.013	-0.608	0.385	-1.580	0.114
Applied & Accepted <sup>a</sup>	-0.375	0.338	-1.110	0.267	-0.014	0.386	-0.040	0.971
Age (t)	0.179	0.008	22.730	0.000	0.095	0.016	6.100	0.000
Age square (t)	-0.002	0.000	-18.350	0.000	-0.001	0.000	-4.310	0.000
Unemployment rate (t)	-3.464	1.082	-3.200	0.001	0.646	1.540	0.420	0.675
Observations	5,794				2,596			
R-Squared	0.59				0.40			
MSE	0.57				0.86			

<sup>a</sup> Reference category is no application.

Source: Author's calculations using HRS data.

**Appendix Table 7B: Forecasting Autoregression Used for Earnings Predictions for Men and Women**

Dependent variable: log earnings (t+4)	MEN				WOMEN			
	Estimate	Std. Err.	T-Value	P-Value	Estimate	Std. Err.	T-Value	P-Value
Intercept	2.416	0.197	12.240	0.000	1.791	0.377	4.76	0.000
Log of earnings (t+3)	0.549	0.015	36.820	0.000	0.450	0.022	20.93	0.000
Log of earnings (t+2)	0.161	0.017	9.700	0.000	0.158	0.023	6.72	0.000
Log of earnings (t+1)	0.053	0.016	3.350	0.001	0.015	0.023	0.67	0.502
Log of earnings (t)	0.049	0.013	3.810	0.000	0.079	0.018	4.3	0.000
Disability (t+4)	-0.224	0.043	-5.260	0.000	-0.119	0.064	-1.87	0.061
Disability (t+3)*log earnings (t+3)	0.007	0.007	1.050	0.293	-0.009	0.011	-0.77	0.439
Disability (t+2)*log earnings (t+2)	-0.004	0.008	-0.470	0.641	0.005	0.013	0.38	0.701
Disability (t+1)*log earnings (t+1)	0.022	0.009	2.510	0.012	0.016	0.015	1.04	0.298
Disability (t)*log earnings (t)	-0.011	0.009	-1.310	0.190	-0.007	0.015	-0.43	0.669
Spell length	0.003	0.005	0.580	0.560	0.001	0.008	0.14	0.892
Applied & Rejected <sup>a</sup>	-0.439	0.085	-5.190	0.000	-0.266	0.186	-1.43	0.153
Applied & Accepted <sup>a</sup>	-1.541	0.099	-15.610	0.000	-0.871	0.141	-6.16	0.000
Age (t)	-0.006	0.010	-0.640	0.525	0.038	0.018	2.1	0.036
Age square (t)	0.000	0.000	-0.710	0.478	0.000	0.000	-2.31	0.021
Unemployment rate (t)	-4.761	0.758	-6.280	0.000	-0.653	1.157	-0.56	0.573
Observations	5,794				2,596			
R-Squared	0.48				0.35			
MSE	0.55				0.75			

<sup>a</sup> Reference category is no application.

Source: Author's calculations using HRS data.

**Appendix Table 8A: Projected SSDI Monthly Benefits for Men<sup>a</sup>**

YEAR	Number of Eligible Individuals	Mean	Standard Deviation	YEAR	Number of Eligible Individuals	Mean	Standard Deviation

1961	7	1,339	339	1986	252	2,254	641
1962	7	1,301	353	1987	309	2,241	673
1963	21	1,321	346	1988	249	2,326	599
1964	21	1,303	341	1989	328	2,274	671
1965	42	1,317	370	1990	250	2,420	569
1966	42	1,301	383	1991	332	2,288	686
1967	56	1,367	400	1992	257	2,426	619
1968	54	1,558	451	1993	331	2,338	712
1969	76	1,531	448	1994	250	2,508	638
1970	75	1,702	495	1995	277	2,323	705
1971	104	1,789	531	1996	194	2,300	703
1972	104	1,889	573	1997	202	2,302	713
1973	135	2,186	657	1998	130	2,420	718
1974	131	2,079	662	1999	131	2,475	741
1975	170	2,066	708	2000	69	2,563	752
1976	158	2,179	750	2001	70	2,572	760
1977	194	2,213	777	2002	13	2,405	678
1978	180	2,252	810	2003	13	2,399	674
1979	222	1,855	570	2004	5	1,788	351
1980	203	1,767	553	2005	5	1,781	342
1981	253	1,720	566	2006	4	1,713	335
1982	231	1,791	597	2007	4	1,701	331
1983	276	1,921	653	2008	2	1,674	552
1984	252	2,002	669	2009	2	1,680	543
1985	319	1,986	695				

<sup>a</sup> Projected PIA amounts in 1967 dollars for SSDI benefit eligible men. The total number of men in the sample is 592.  
Source: Author's calculations using HRS data.

**Appendix Table 8B: Projected SSDI Monthly Benefits for Women<sup>a</sup>**

YEAR	Number of Eligible Individuals	Mean	Standard Deviation	YEAR	Number of Eligible Individuals	Mean	Standard Deviation
1961	1	540	.	1991	330	1,265	544
1962	1	528	.	1992	256	1,406	472
1963	2	528	0	1993	371	1,257	547
1964	2	516	0	1994	308	1,307	562
1965	7	614	202	1995	334	1,241	554
1966	7	598	194	1996	234	1,284	528
1967	17	805	314	1997	258	1,271	544
1968	16	945	296	1998	205	1,284	513
1969	26	893	258	1999	208	1,312	531
1970	26	946	332	2000	142	1,353	524
1971	39	1,188	462	2001	143	1,366	528
1972	37	1,271	493	2002	78	1,392	478
1973	53	1,344	583	2003	78	1,395	474
1974	53	1,282	542	2004	49	1,375	489
1975	77	1,264	507	2005	49	1,377	483
1976	72	1,330	533	2006	27	1,445	491
1977	94	1,292	547	2007	27	1,448	488
1978	85	1,310	574	2008	15	1,529	508
1979	118	1,050	405	2009	15	1,536	501
1980	109	976	392	2010	9	1,600	531
1981	155	958	383	2011	9	1,605	523
1982	142	945	445	2012	4	1,500	555
1983	194	973	488	2013	4	1,503	547
1984	168	1,077	508	2014	2	1,746	161
1985	211	1,090	519	2015	2	1,758	144
1986	172	1,288	483	2016	2	1,758	144
1987	255	1,192	549	2017	2	1,758	144

1988	200	1,348	474	2018	2	1,764	136
1989	286	1,229	555	2019	2	1,776	136
1990	224	1,385	467				

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<sup>a</sup> Projected PIA amounts in 1967 dollars for SSDI benefit eligible women. The total number of women in the sample is 493.  
Source: Author's calculations using HRS data.



**Appendix Table 9: Descriptive Statistics, by Gender<sup>a</sup>**

Variables	Men		Women		
	Mean	St.Dev.	Mean	St.Dev.	
<i>Disability Section</i>					
Onset	79.943	9.286	82.491	8.234	
Age at onset	45.326	9.624	45.201	8.905	
Employer accommodation	0.270	0.444	0.266	0.442	
<i>SSDI Application</i>					
SSDI application status					
Wave 1	0.619	0.486	0.557	0.497	
Wave 2	0.650	0.477	0.604	0.489	
Spell length	4.035	3.751	3.469	2.905	
<i>Demographic Measures</i>					
Marital status	0.829	0.376	0.673	0.469	
Education	11.059	3.467	11.487	2.580	
SSA records available	0.833	0.373	0.805	0.396	
Race					
White	0.708	0.455	0.692	0.462	
Black	0.194	0.396	0.221	0.415	
Other Race	0.098	0.298	0.087	0.282	
Region					
Northeast	0.167	0.373	0.152	0.360	
Midwest	0.240	0.427	0.239	0.427	
South	0.443	0.497	0.446	0.498	
West	0.150	0.358	0.162	0.369	

**Appendix Table 9 (Cont'd.): Descriptive Statistics, by Gender**

Variables	Men		Women	
	Mean	St.Dev.	Mean	St.Dev.
<i>Income Variables</i>				
Expected Earnings				
No application				
Period 1	4,182.13	3,380.93	1,816.34	1,900.45
Period 5	3,625.51	2,907.89	1,789.27	1,822.38
Period 10	3,230.32	2,577.57	1,712.52	1,739.83
Period 15	2,712.92	2,175.23	1,590.72	1,581.68
Applied & Rejected				
Period 1	2,005.40	1,514.54	1,033.12	1,044.64
Period 5	1,675.26	1,236.41	1,023.93	994.90
Period 10	1,537.88	1,128.46	963.28	935.79
Period 15	1,380.66	1,036.69	893.28	840.46
Applied & Accepted				
Period 1	796.75	851.78	532.78	865.02
Period 5	671.94	719.03	475.70	676.57
Period 10	611.23	707.54	385.05	551.70
Period 15	507.87	633.60	336.56	397.79
Expected Benefits				
Period 1	2,070.61	707.77	1,154.22	491.46
Period 5	2,132.24	699.33	1,197.95	508.60
Period 10	2,132.29	712.96	1,213.30	533.85
Period 15	2,082.39	718.30	1,220.51	533.32
<i>State Level Variables</i>				
SSDI Allowance Rate				
Period 1	0.376	0.060	0.366	0.057

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	Period 5	0.377	0.057	0.372	0.054
	Period 10	0.373	0.054	0.376	0.053
	Period 15	0.369	0.054	0.371	0.042
Unemployment Rate					
	Period 1	0.071	0.014	0.070	0.015
	Period 5	0.070	0.014	0.070	0.014
	Period 10	0.071	0.016	0.070	0.014
	Period 15	0.070	0.015	0.070	0.012

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**Appendix Table 9 (Cont'd.): Descriptive Statistics, by Gender**

Variables	Men		Women	
	Mean	St.Dev.	Mean	St.Dev.
<i>Health Section</i>				
Conditions				
Two Conditions	0.289	0.454	0.314	0.465
Three Conditions	0.177	0.382	0.191	0.393
Arthritis	0.084	0.278	0.172	0.378
Cardiovascular	0.287	0.453	0.105	0.307
Musculoskeletal	0.395	0.489	0.424	0.495
Other health condition	0.233	0.423	0.298	0.458
General Health Indicators				
General health poor	0.610	0.488	0.594	0.492
Health status worsened	0.304	0.460	0.308	0.462
Emotional health poor	0.361	0.481	0.428	0.495
Has never smoked	0.848	0.359	0.641	0.480
Smoking now	0.365	0.482	0.331	0.471
ADLs				
run or jog about a mile	0.889	0.315	0.897	0.305
walk several blocks	0.431	0.496	0.465	0.499
walk one block	0.196	0.397	0.241	0.428
walk across a room	0.049	0.216	0.099	0.299
sit for about 2 hours	0.306	0.461	0.353	0.478
get up from a chair	0.343	0.475	0.396	0.489
get in and out of bed	0.113	0.317	0.158	0.365
climb several stairs	0.584	0.493	0.682	0.466
climb one flight of stairs	0.262	0.440	0.365	0.482
lift or carry weights	0.329	0.470	0.544	0.499
stoop, kneel, or crouch	0.515	0.500	0.606	0.489

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Pick up a dime from a table	0.076	0.265	0.114	0.318
bathe or shower	0.083	0.276	0.097	0.297
reach or extend arms	0.172	0.378	0.215	0.411
Pull or push large objects	0.394	0.489	0.554	0.498
eat without help	0.007	0.082	0.018	0.134
dress without help	0.034	0.181	0.047	0.211

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**Appendix Table 9 (Cont'd.): Descriptive Statistics, by Gender**

Variables	Men		Women	
	Mean	St.Dev.	Mean	St.Dev.
<i>Employment Section</i>				
<i>Occupation</i>				
Manager	0.083	0.276	0.061	0.239
Professional	0.066	0.248	0.073	0.260
Sales	0.044	0.205	0.087	0.282
Clerical	0.054	0.226	0.225	0.418
Service	0.073	0.260	0.262	0.440
Craftsperson	0.282	0.450	0.051	0.220
Laborer	0.331	0.471	0.207	0.405
Military	0.029	0.167	0.000	0.000
Occupation missing	0.039	0.193	0.034	0.183
White collar	0.149	0.356	0.134	0.341
<i>Industry</i>				
Agriculture	0.041	0.197	0.018	0.134
Mining	0.135	0.342	0.010	0.100
Manufacturing	0.341	0.475	0.227	0.419
Transportation	0.120	0.325	0.037	0.188
Retail-Wholesale-Finance	0.135	0.342	0.239	0.427
Service	0.030	0.172	0.112	0.315
Professional Service	0.079	0.271	0.298	0.458
Public administration	0.074	0.263	0.022	0.148
Industry missing	0.044	0.205	0.037	0.188
Number of Observations		592	493	

<sup>a</sup> Monetary amounts are in 1967 dollars.

Source: Author's calculations using HRS data.



**Appendix Table 10: Certainty equivalents (CE)**

<b>Men</b>			
	Dynamic Programming Normal	Option Value Normal	Option Value Weibull
$\gamma$	0.403	0.450	0.585
CE	\$14,488	\$14,528	\$14,644

  

<b>Women</b>			
	Dynamic Programming Normal	Option Value Normal	Option Value Weibull
$\gamma$	0.520	1.678	1.046
CE	\$14,589	\$15,560	\$15,039

Source: Author's calculations using HRS data.