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How Policy Variables Influence the Timing of Social Security Disability Insurance Applications

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Social Security Disability Insurance (SSDI) is the largest federal transfer program targeted on workers with disabilities. It dominates all other government programs aimed at this population. It replaces the earnings of those workers who, due to a health condition, are no longer able to perform any substantial gainful activity. Like all transfer programs triggered by lost earnings, SSDI may have the unintended consequence of discouraging work.

United States public policy toward people with disabilities took a major turn in the 1990s with the passage of the Americans with Disabilities Act of 1990 (ADA). It is the centerpiece of a new effort by government to keep people with disabilities in the workforce. Title I of the ADA requires employers to make reasonable accommodations for workers with disabilities unless this would cause undue hardship to the operation of business. One of the hopes underlying the ADA is that accommodation at the onset of a health condition will delay job exit and a subsequent move onto the disability rolls. Yet, before the ADA was enacted and even now, little systematic evidence exists about the labor force experience of people with disabilities and how they and their employers respond when a health condition begins to affect work.

These two policy thrusts—SSDI transfers to replace lost earnings and accommodation to increase duration on the job—can send mixed signals to workers who experience the onset of a disability. While the onset of a health based work limitation will affect a worker's ability to remain on the job, it does not necessarily result in a swift and certain job exit and transition onto the disability rolls. The decision to leave the workforce and apply for SSDI benefits can be influenced both positively and negatively by policy variables. Hence, understanding how such policies influence behavior for those

who experience a disability is critical in developing policies that fully integrate people with disabilities into the workforce.

Using retrospective data from the Health and Retirement Study (HRS) together with matching state level data on SSDI allowance rates and individual level Social Security administrative record data on the generosity of SSDI benefits, we estimate the relative importance of policy variables—employer accommodation as well as the relative value and likelihood of acceptance onto the SSDI program—on the timing of SSDI application following the onset of a disability. The results show that employer accommodation significantly slows a worker's application for SSDI benefits while easier access to SSDI benefits and more generous SSDI benefits increase the speed of application following the onset of a health condition.

A Theoretical Model of the Timing to SSDI Application

We use a basic lifecycle labor supply model to motivate our discussion of the likely impact of public policy on a worker's decision to apply for SSDI benefits. Our model assumes workers maximize their lifetime utility over two periods—the time before and the time after disability application. Utility in the first period comes from income from work. Utility in the second period depends on the outcome of the application. If the applicant is awarded disability benefits, then the worker is assumed not to return to work and to collect benefits until normal Social Security retirement age. If the applicant is not awarded benefits, the worker is assumed to either live off income from non-labor sources or to return to work at a lower wage until normal Social Security retirement age.

Like other models used in the disability literature, we assume utility is a function of income flows. This approach allows us to abstract from the complex budget constraint

encountered by a worker with a disability (Parsons 1984, 1995; Haveman and Wolfe, 1984). Equation 1 describes the general form of the choice to apply for benefits following the onset of a disability.

$$Max_{A}\ V = \int_{0}^{A} e^{-rt} U_{W}(t)\ dt + \int_{A}^{R} e^{-rt} U_{A}(t)\ dt\ , \qquad \textbf{(1)}$$

where: 0 is the year of onset; A is the time of first SSDI application; R is the time of normal retirement; r is the discount factor; t is time; $U_W(t)$ is the utility from work at period t prior to application; and $EU_A(t)$ is the expected utility in period t following application.

The worker chooses a time, A*, that maximizes the present value of lifetime utility shown in Equation 1. Equation 2 is the first order condition used to determine the optimal year for SSDI application.

$$\frac{\partial V}{\partial A}: e^{-rA}U_{W}(A) - e^{-rA}EU_{A}(A) = 0. \qquad \textbf{(2)}$$

The first term in Equation 2 is the marginal change in the present value of utility due to additional time spent in the pre-application period. The second term in Equation 2 represents the marginal change in the present value of expected utility due to additional time in the post-application period. To maximize utility, the worker will apply for SSDI benefits at A*, where the marginal value of an additional year in the pre-application period is equal to the marginal value of an additional year in the post-application period, if the second order condition is satisfied. Equation 3 is the second order condition.

$$\frac{\partial^2 V}{\partial A \partial A}: e^{-rA}\left(\left(\frac{\partial U_{W}(A)}{\partial A} - rU_{W}(A)\right) - \left(\frac{\partial U_{A}(A)}{\partial A} - rU_{A}(A)\right)\right) < 0. \qquad \textbf{(3)}$$

The first two terms inside the brackets show the rate of change in the present value of utility from an additional year in the pre-application period. The last two terms inside the brackets show the rate of change in the present value of utility from an additional year in the post-application period. The second order condition is satisfied when the rate of change in the pre-application period is less than in the post-application period.[1]

The utility functions presented below are similar in spirit to those in the disability literature. The period t utility from work prior to first application, shown in Equation 4, is specified as in Parsons (1991) and Diamond and Sheshinksi (1995).

$$U_W(t) = U(Y_W) + b, \qquad \textbf{(4)}$$

where: $U(Y_W)$ is utility from income in the pre-application period, Y_w is income during this period, and b represents disutility from work. Higher pre-application earnings increase the marginal value of the pre-application period and delay SSDI application. Because b represents disutility from work, it is strictly negative. Larger negative values reflect greater distaste for work. Workers with a relatively low distaste for work will have a relatively high marginal value in the pre-application period, and will delay application for SSDI benefits. The ADA requires firms to accommodate workers with disabilities. In this model, employer accommodations are assumed to reduce that part of b that was caused by the onset of a health condition, thus delaying SSDI application.

Period t utility for the post-application period, shown in Equation 5, is specified in a similar manner to Halpern and Hausman (1986), Parsons (1991) and Kreider (Forthcoming). It is a state-dependent utility function as shown in Equation 5.

$$EU_A(t) = f(t)U(Y_A(t)) + (1 - f(t))U(Y_R(t)), \qquad \textbf{(5)}$$

where: ϕ is the probability of being awarded benefits; $U(Y_A)$ is utility derived from SSDI benefits; Y_A is income if awarded SSDI benefits; $U(Y_R)$ is utility derived from income if the applicant is rejected for SSDI benefits; and Y_R is income if rejected for SSDI benefits.

Higher SSDI benefit levels increase the marginal value of the post-application period and will lead to quicker SSDI application. A relatively high probability of acceptance is expected to increase the marginal value of the post-application period and speed the time to application. We assume that the probability of a successful award by a worker is a function of the allowance rate for SSDI applicants in the worker's state of residence. Workers who live in states with relatively easy and porous screening processes have a higher probability of initial acceptance, and thus a higher marginal value in their post-application period which will induce them to apply sooner than other workers. Because Social Security Administration guidelines for eligibility include medical as well as vocational criteria we also assume that those workers with health conditions that are more serious are more likely to be accepted, as are those whose vocational characteristics are weaker—poor education, older, manual laborers, etc.—and thus both are likely to apply more quickly.

The Empirical Specification: A Hazard Model

We use a variant of the Diamond and Hausman (1984) hazard model. The respondents' hazard rate is defined as the probability of applying for SSDI benefits once a work limiting condition first begins to bother them.[2]

We know the year of onset for all our respondents, so left censoring is not a problem. However, many workers in our sample have not applied for benefits by 1992, and they are right censored. Our hazard model explicitly accounts for right censored

observations. We use an interval hazard that controls for unobserved heterogeneity to estimate the impact of policy on the transition to SSDI application. We integrate unobserved heterogeneity out of the likelihood function by assuming a log normal form. Equation 6 describes the hazard function for person j in the sample:

$$h_j(t_j) = \exp(X_j' b + t_j g_1 + t_j^2 g_2 + e), \quad \textbf{(6)}$$

where: X_j is the vector of explanatory variables for person j; β is the vector of coefficients for the explanatory variables; t_j is time; γ_1 and γ_2 are the coefficients on time and time squared respectively; and ε is unmeasured heterogeneity which is assumed to be distributed log normal. Using this hazard function specification, Equation 7 describes the resulting likelihood function f for person j who applies for disability at time t_j.

$$f_j = h_j(t_j) \exp\left(-\int_0^{t_j} h_j(s)\, ds\right). \quad \textbf{(7)}$$

Equation 8 describes the resulting likelihood function f for person j who is right censored.

$$f_j = \exp\left(-\int_0^{t_j} h_j(s)\, ds\right). \quad \textbf{(8)}$$

We use an interval hazard because we can not observe the exact time of SSDI application. We only know that application occurred sometime during a given year. Equation 9 describes the situation where an application occurs at t_j, but is only captured as occurring between t_s and t_e, a one year interval.

$$f_j = \int_{t_s}^{t_e} h_j(v) \exp\left(-\int_0^{v} h_j(s)\, ds\right) dv. \quad \textbf{(9)}$$

Data

The Health and Retirement Study (HRS) is a longitudinal data set that tracks the behavior and economic well-being of a representative cohort of men and women born

between 1931 and 1941 and their spouses through their retirement years. Three waves of data are now available. In 1992 (Wave 1), a total of 12,654 men and women from 7,607 households were asked detailed questions regarding their labor force participation, health status, family structure, disability status, wealth holdings, and income. These data were then match to restricted Social Security Administration records that contain a respondent's social security earning records.

While the data set is large, even at these ages –51 to 61 in 1992—the onset of a disability is a relatively rare event. Hence, even with three waves of data it is difficult to make full use of the longitudinal nature of the data by contemporaneously looking at work behavior following the onset of a disability. However, the HRS has a retrospective module that contains a series of questions focused on events following the onset of a current work limiting health condition. We use these data here.

In the first wave of the HRS, 1,280 men and 1,338 women report having an impairment or health problem that both limited the kind or amount of paid work they could perform and that they expected to last for at least three months. Of these, 848 men and 642 women said they were working for someone else (not self-employed) at the onset of this disability. Of these respondents, we use 577 men and 422 women in our analysis. Most of the final round of respondents were excluded because they experienced the onset of their disability prior to 1974, the first year we have information on state allowance rates.

Variables

Table 1 describes the set of variables we use in the analysis.

Duration to SSDI Application Variables. Each person in our sample reported having a long term work-limiting disability. Each was asked when that condition first began to bother them and when the condition first began to interfere with their work. We use the year the condition first began to bother the respondent to mark the onset of a disability.[3] These respondents were also asked if they applied for SSDI benefits. For those who have applied, their spell ends at the year of application. For those who have not yet applied by 1992, their spell length is censored.

Policy Variables. We define the state allowance rate as the number of initial SSDI allowances at the state level divided by the number of SSDI applications in the state for the given year.[4] We use the HRS restricted data on geographical location to match yearly SSDI allowance rates to each person in the sample.[5] This is a time-varying variable in the model. A higher allowance rate is expected to increase the hazard of SSDI application.

We constructed each worker's potential yearly SSDI benefit from the restricted use Social Security Administration records that contain respondents' social security earnings histories. To do so, we used program rules from 1974 through 1993 to calculate expected monthly Primary Insurance Amount (PIA) values for each year in our analysis and then annualized this value and used it as a time varying variable in the model.[6] Higher values are expected to increase the hazard of SSDI application.[7]

Employer accommodation is based on a question to the respondent asking if the employer did anything special for the respondent at disability onset so that they could

remain at work. Employer accommodation is expected to reduce the hazard of SSDI application.

Economic Variables. The loss of expected earnings in the period following application is the opportunity cost of applying for SSDI benefits. The greater a worker's potential labor market earnings, the more expensive is SSDI application. Burkhauser, Butler, Kim and Weathers (1999) found that higher expected earnings delayed SSDI application for men. We use an approach similar to Burkhauser et al (1999) to measure expected earnings in this analysis.[8] This is a time varying variable in our analysis.

We use the state unemployment rate to capture business cycle effects that influence a worker's decision to apply for SSDI. During a recession, one might expect that layoffs and poor job opportunities would lead to quicker application for disability benefits.[9] In addition, controlling for the unemployment rate may provide a cleaner estimate of the impact that the state allowance rate has on SSDI application.[10]

Data on the state unemployment rate come from the Lewin Group Public Use data file. The Lewin Group obtained the data from the Bureau of Labor Statistics for all 50 states and the District of Columbia. The data are merged to individual records using the restricted HRS state identifiers. These data vary over time in the model. A higher unemployment rate is expected to reduce duration to SSDI application.

Other economic variables included in our hazard model to control for individual heterogeneity include—spouse's work status, savings, industry, occupation, employer size, and union status.

Health Variables. By definition all the people in our sample have a health condition in 1992 whose onset initiates our analysis. Hence we are looking at the

behavior of a sample of persons who by selection have a disability. What we attempt to do with our health variables is to control for variations in health status within the population with a work limiting condition. Our first comorbidity measure captures the impact that two health conditions have at onset. The second comorbidity measure captures the impact that three or more health conditions have at onset.

Two factors associated with these measures should affect the timing of SSDI application. First, additional health conditions may make adaptation to a disability more difficult and increase the speed of application. Second, the 1984 Amendments to the Social Security Act required SSA to consider the combined effect of all impairments regardless of whether any one impairment, considered separately, would be considered severe enough for acceptance into the SSDI program. Multiple conditions may increase a worker's chances for an award, as well as increase the adaptations that are necessary to remain in the labor force, and thus increase speed to SSDI application.

It is likely that some health conditions lead to more rapid application than others. Musculoskeletal conditions, such as arthritis and back, neck, and spine problems, tend to be chronic and hence are likely to lead to a relatively longer duration until SSDI application. Cardiovascular conditions, such as strokes and heart attacks, tend to be acute and lead to shorter duration to SSDI application. In Table 1 we provide a list of the diagnosed conditions included in each of these categories.

We examine the importance of other types of health conditions on the application decision in additional specifications. The additional conditions include cancer, paralysis, respiratory conditions, endocrine/digestive conditions, neurological conditions, emotional

conditions and other miscellaneous conditions. Table 1 also shows the specific diagnosed conditions in each of these categories.

Demographic Variables. Education, age, marital status and race are included to capture differences in labor market attachment across demographic groups. Most labor supply studies have found that these variables influence labor supply.

Descriptive Statistics

Table 2 provides the sample descriptive statistics for the variables listed in Table 1. Descriptive statistics using the year the condition first began to interfere with the person's job as the date of onset are reported in Appendix Table 1. While the sample population is virtually the same, there are some small differences since the year the condition first began to bother the respondent occurred before the year the condition first began to interfere with work for about 30 percent of males, and 33 percent of females. Nonetheless, as Appendix Table 2 shows, for the vast majority of cases the two onset years are the same or are only a few years apart.

The Timing of Application for SSDI Benefits: Evidence from Life Tables

Table 3 contains life tables that describe the spell lengths and hazard of SSDI application for our sample. The first column of Table 3 shows the number of years since the onset of a disability. The next four columns show, for men: the probability of surviving to the beginning of the year; the number who apply within the year; the number who are censored within the year; and the hazard rate. The next four columns show these same values for women.

The estimated survival rates show that the median man waits until his seventh year following the onset of a disability before he applies for SSDI benefits. The median

woman waits until her eighth year. While the risk of application is greatest in the first year following onset, only 16 percent of men and 13 percent of women apply in the first year. The hazard rate declines thereafter.[11] This suggests that the vast majority of men and women who experience a disability while on the job, do not apply for SSDI benefits immediately or even quickly.

The Importance of Ease of Access to SSDI Benefits: Kernel Density Estimates

While SSDI is a federal program with uniform eligibility rules across states, all administration decisions regarding initial eligibility are done at the state level. Appendix Table 4 shows the mean allowance rate for each state between 1974 and 1993. Appendix Table 5 show the mean of the state allowance rates for each year. These tables show that the variability in allowance rates across states and over time is enormous. This variation in SSDI state allowance rates is used to examine the impact that the ease of access to SSDI benefits has on a worker's application behavior.

Figure 1 shows non-parametric kernel density estimates of the distributions of male applicants and non-applicants ordered by state SSDI allowance rates. The data in the top part of Figure 1 are straightforward. They show these two distributions for the first year following the onset of a disability, ordered by the state allowance rates in that year. The data for distributions in the bottom part of Figure 1 are more complex. In our analysis, workers who do not apply for benefits in the first period continue to contribute observations to the sample until they do so or are censored. Each person may be included up to 10 times. Hence, these distributions contain observations for males who do or do not apply for benefits, ordered by the state SSDI allowance rates for each year, for up to 10 years following the onset of a disability. Figure 2 contains the same set of

distributions for women. The horizontal axis of the figures measures the state allowance rates. The vertical axis measures the estimated density of all sample members (for all relevant years) at each state allowance rate. The bolder of the two lines shows the kernel density estimate for workers who had not applied for SSDI benefits within the period, while the relatively thin line shows the kernel density estimate for worker who had applied for SSDI benefits. For men, the two distributions cross at an allowance rate of about 39 percent. For women, they cross at an allowance rate of about 35 percent. In all four figures the mass in the application distribution is greater than the mass in the non-application distribution past the intersection point. That is, for both men and women the mass of applicants is greater than the mass of non-applicants in states with higher allowance rates. This suggests that workers may be sensitive to their individual state allowance rate in the decision to apply for benefits.

The Kolmogorov-Smirnov test was used to test whether the two distributions in each figure are statistically different. The details of the kernel density estimation procedure and the Kolmogorov-Smirnov test are provided in the Appendix. The Kolmogorov-Smirnov test statistic for equality within the two first year male distributions in Figure 1 is 0.86, less than the 10 percent critical value of 1.22. For the observations in the bottom part of Figure 1, the test requires the strong assumption that there is no serial correlation within person-year observations. Given that assumption, the Kolmogorov-Smirnov test statistic for the 10-year distributions is significant at the 5 percent level.

The Kolmogorov-Smirnov test statistic for the two first year female distributions is 1.37, greater than the 5 percent critical value of 1.36. The two distributions for the 10-

year period are also significantly different but again the test requires the strong assumption of no serial correlation within person-year observations.

To further illustrate the relationship between the state allowance rate and SSDI application, Table 4 shows the mass of men and women above the intersection of the two kernel density estimates of the first year distributions. Standard errors are in parentheses. The last two columns of Table 4 show the estimated difference between the upper tail masses in the two samples and their t-values.

The percentage of both men and women in the region above the intersection who apply for SSDI benefits within the first year following the onset of a disability is greater than the percentage who do not apply for benefits. For men, 38.3 percent of the sample who apply have an allowance rate above the intersection, while only 32.9 percent of the sample who do not apply are above it. The 5.38 percentage point difference appears large but, because we only observe 94 men applying within the first period after onset, the standard error of this difference is too large to infer that the difference is statistically different from zero. For women, the intersection occurs below the median of each sample. As a result, 68.2 percent of women who apply for disability benefits have a state allowance rate above the intersection while 53.4 percent of women who do not apply are above it. This amounts to a 14.8 percentage point difference and it is statistically significant at the 5 percent level. These results suggest that there is a relationship between the state allowance rate and the decision to apply for SSDI benefits following the onset of a disability. [12]

The Importance of Employer Accommodation on the Speed to Application

Table 5 provides life table risks of applying for SSDI benefits for men who were and were not accommodated by their employer following the onset of their disability. The last two columns of the life table describe the difference in the hazard of SSDI application across responses for each time period and an estimated t-value. The overall difference in the risk of applying for benefits across responses for all time periods is estimated and tested using a Cox proportional hazard model.

Men who were accommodated have significantly smaller risks of application for SSDI over the first three periods following onset. Furthermore, the Cox proportional hazard model estimate indicates that they have, on average, a significantly smaller risk of applying for SSDI benefits. The relative risk of application for men who were accommodated by their employer is on average 0.44 times that of men who do not receive accommodation. The results in Table 6 for women are similar.[13]

Hazard Model Estimates

Table 7 shows the results of our interval hazard model.[14] The first column of Table 7 shows the variables used in the model. Columns 2 and 3 show the estimated coefficient and the asymptotic t-value of the model parameters for the sample of men while columns 4 and 5 show the estimated coefficient and the asymptotic t-value for women. The coefficient does not provide a measure of the magnitude of the particular variable's impact on the hazard. The marginal impact of all the variables in Table 7 are estimated and examined in Table 8.

The policy variables in Table 7 affect the application hazard in the predicted direction and are statistically significant for both men and women. Holding other variables in the model constant, an increase in the state allowance rate or an increase in

the expected SSDI benefit increases the hazard of SSDI application, while employer accommodation reduces the hazard of SSDI application.

Most of the economic and demographic variables in the model also influence application behavior in the expected direction. Persons with higher expected earnings have a lower hazard of SSDI application while persons who live in states with higher unemployment rate have a higher hazard of SSDI application. The estimated coefficients are statistically significant for both men and women. Education, age at onset and experience have signs consistent with the earlier predictions. However, experience for men and education for women are not significant at the 5 percent level.

The white-collar job variable is negative, implying that persons in white-collar jobs have lower SSDI application hazards, but it is only statistically significant for women. The presence of a spouse at onset increases the hazard of application for men and decreases the hazard of application for women, but these coefficients are not statistically significant at the 5 percent level. Relative to whites, both blacks and members of other races tend to have higher SSDI application hazards, but the coefficients are statistically significant only for blacks. For women, the SSA record missing variable is positive, that is women who did not provide permission to have their records matched to the HRS data had a higher hazard of SSDI application. The effect was not significant at the 5 percent level but was statistically significant at the 10 percent level.[15] For men, the effect was not statistically significant.

The health conditions have the predicted effects and are statistically significant at the 5 percent level for both men and women. Persons with two conditions or three or more conditions at onset have a higher hazard of SSDI application. Persons with

musculoskeletal conditions tend to have smaller application hazards, or tend to delay SSDI application. The effect of cardiovascular conditions can not be distinguished from the reference group of all other health conditions contained in the constant.

To test the robustness of the model, in Appendix Table 7 we use the year the health condition began to first interfere with work as the starting point of our analysis. The policy variables continue to significantly affect application speed.

To further test the robustness of our model, in Appendix Table 8, we added more controls for health and job characteristics. This specification does not affect the sign or significance of the policy variables.

Marginal Effects. The coefficients in Table 7 do not measure the size of the impact that the explanatory variables have on timing to SSDI application. In Table 8, we measure the magnitude of the effects of the variables in the hazard model by taking the derivative of the expectation of the outcome—the probability of applying for benefits within a given time period following the onset of a disability—with respect to the explanatory variable of interest. Because the equation is non-linear, the point at which the derivatives are evaluated will affect the results. We follow the tradition in the literature by using the sample means to evaluate marginal impacts.

The first column in Table 8 presents the list of Table 7 variables. The next four columns show, for the sample of men, the estimated: probability of application within the first five years; probability of an application within the first 10 years; probability of an application within the first 15 years; and the expected time from onset to SSDI application. The final four columns of Table 10 show the estimates for the sample of women.

The first row of Table 8 shows the estimated mean outcomes for each column. Each succeeding row show the estimated mean outcome based on a change of 20 percent in the explanatory variables from its mean level.

As can be seen in row one, on average 34 percent of men are expected to apply within the first five years, 54 percent are expected to apply within the first 10 years and 66 percent are expected to apply within the first 15 years. The expected duration to application is 10.45 years. For women, 27 percent are expected to apply within five years, 49 percent are expected to apply within 10 years and 68 percent are expected to apply within 15 years. The expected duration for women is 10.99 years.

In the next three rows, the effect of policy variables on the application decision is presented. A 20 percent increase in the state allowance rate would increase mean allowance rates from about 36 percent to about 43 percent. This increase represents a one standard deviation movement in the distribution and is well within the range of the data. Such an increase would increase applications by 4 percent within the first five years, an increase from 34 to 38 percent in the expected exit rate. Within 10 years, the marginal effect is a 5 percentage point increase. It is 6 percentage points within 15 years. Finally, a 20 percent increase in the state allowance rate would reduce the time to application by 0.83 years. For women, the changes are even greater.

The next row shows the marginal impact of the expected SSDI benefits. An increase of 20 percent in the SSDI benefits would amount to a change from about $6,800 to about $8,160 dollars in the first year and an increase from about $7,800 to $9,360 in year 10 for men. This increase represents a one standard deviation movement in the distribution and is well within the range of our data. The increase induces an additional

10 percentage points of men to apply within five years, an additional 14 percentage points to apply within 10 years and an additional 15 percentage points of men to apply for benefits within 15 years following the onset of a disability. It reduces the time to SSDI application by 2.08 years. For women the marginal changes are slightly higher.

The impact of universal employer accommodation is shown in the next row. This increase is outside the range of our data but is a useful measure of the maximum effect of the ADA. Universal employer accommodation would reduce applications by 15 percentage points within five years, 20 percentage points within 10 years and 21 percentage points within 15 years. Expected duration would increase by 3.13 years. The maximum impact of accommodation is slightly smaller for women.

Appendix Table 9 shows the marginal impact of variables for men and women using the year the condition first began to interfere as the onset year. The results are similar in magnitude.

Conclusions

The institutions workers face following the onset of a disability have a significant effect on the timing of their SSDI application. Using retrospective data from the HRS we show that Social Security policy variables—the state allowance rate and the size of one's SSDI benefit—significantly influence the speed to SSDI application following the onset of a disability.

When we compare kernel density estimates of the distribution of those who apply for SSDI benefits soon after the onset of their disability across states ordered by the state's allowance rate with the same distribution for those who do not apply for benefits, we find a difference between the two distributions with a greater mass of early applicants

living in states with a high allowance rate. Using a hazard model to control for both observed and unobserved heterogeneity we find that higher state allowance rates increase the hazard of SSDI application. A 20 percent increase in state allowance rates at the mean value of all other variables would reduce male expected duration before application for SSDI benefits by 0.83 years, a decline from 10.45 to 9.62 years. The decline for women is even higher—from 10.99 to 9.52 years.

In that same hazard model we also find that those with larger disability benefits also have a significantly greater risk of SSDI application. A 20 percent increase in benefits would reduce expected duration for both men and women by over 2 years.

The Americans with Disabilities Act of 1990 was meant to increase the willingness of employers to provide accommodation to workers with disabilities. Using a life table we show that workers who were accommodated following the onset of their disability had significantly lower risks of applying for SSDI benefits within the first three years of onset. When employer accommodations were included in our hazard model, we found they significantly reduced the risk of application. Universal employer accommodation would increase expected duration of men by 3.13 years. For women, expected duration would increase by 2.62 years.

Without question, the onset of a disability dramatically increases the risk of application for SSDI. But our results suggest most workers do not immediately apply for SSDI benefits—the median male did not apply for SSDI benefits until the seventh year following the point at which his health condition began to bother him. The median female did not apply until the eighth year following the onset of her disability. This does not mean that health has no influence on work or application for benefits. In fact, we find

that even within our population with disabilities, the severity of one's health condition and the type of health condition influence the speed to application. We find those with multiple conditions apply significantly sooner. We also find that those with musculoskeletal conditions are significantly slower to apply than those with other conditions. But we find that economic and demographic variables also significantly influence application speed. Those workers with higher earnings and those who live in states with a lower unemployment rate, those with more years of education, as well as those who were younger at onset and who are non-black are all slower to apply for benefits.

But most importantly from a public policy perspective, policy variable significantly influence the speed to application. Our findings suggest that moving toward pro-work policies that, for instance, encourage greater employer accommodation following the onset of a disability or away from policies that make SSDI easier to obtain and more valuable to receive, would significantly slow the speed to SSDI application.

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ENDNOTES

1. If no A* satisfies Equation 2, a corner solution that implies either that the application will occur immediately or that an SSDI application will never occur exists. If all potential values of A yield a marginal value of the pre-SSDI application period that exceeds the marginal value of the post-SSDI application period, the application will never occur. If all potential values of A yield a marginal value of the post-SSDI application period that exceeds the marginal value of the pre-SSDI application period, application will occur immediately at onset. For ease of exposition, the comparative statics in the following sections are based on conditions that ensure an interior solution.

2. The HRS retrospective date provide two alternative starting points for the health condition reported in 1992: 1) when the condition first began to bother the respondent; 2) when the condition first began to interfere with their work. We use the first definition because that is when respondents first became aware of their condition and we assume that it is the point that they re-evaluate their life cycle labor supply given its presence. However we also report the results using the first interfere starting point in the Appendix. Our policy variable results are not sensitive to our choice of starting point.

3. Results using the year the condition first began to interfere with work are reported in the appendix.

4. The Lewin Group, under contract with the Social Security Administration, prepared a public use file that contains annual state allowance rates from 1974 to 1993. The state

allowance rates for 1974 through 1979 were provided by Donald O. Parsons. The state allowance rates for 1980 through 1993 come from the each state's Disability Determination Service. See Lewin Group (1995) for further details. Data for Alaska, Hawaii and the District of Columbia are not available from 1974 through 1979. All 50 states and the District of Columbia are represented in the data from 1980 through 1993.

5. The restricted state level identifiers may be acquired by special permission from the HRS. The website http://www.umich.edu/~hrswww/ provides instructions on the application process for this data. Additional permission is required to link these data with Social Security Records and the link can only be performed at the HRS data enclave at the Institute for Social Research, University of Michigan.

6. Our PIA estimation program uses program rules for the entire time period as reported in the 1998 Social Security Bulletin Statistical Abstract. Our estimation program includes the construction of a respondent's Average Monthly Wages for 1974 through 1978 and a respondent's Average Indexed Monthly Earnings for 1979 through 1993. The estimation program is available upon request.

7. Approximately 25 percent of respondents in our sample refused to allow their social security earning histories to be matched to the HRS data. In such cases, we assigned the sample mean for the expected PIA for each year and added a dummy variable that indicated that the person did not allow their earnings histories to be used. We followed this same procedure in our measure of expected earnings. It is possible that these refusals are not random. In previous work, Burkhauser, Burtler, Kim and

Weathers (Forthcoming), we ran selection-corrected earnings regressions based on information in Wave 1 of the HRS. The inverse Mills ratio was not statistically significant.

8. We considered two issues in constructing our expected earnings measure. First, Social Security earnings histories are censored at the Social Security taxable earnings maximum. Labor earnings above this level are not observed. A tobit was used to estimate total labor earnings for workers taxable maximum. A tobit model has been commonly used to handle this problem in the disability literature (Bound 1989; Kreider 1998, Forthcoming). Second, expected earnings are not observed for workers who apply for benefits. An autoregression is used to predict earnings for such workers. The R-squared for the autoregression is 0.74 for men and 0.82 for women, implying that it has much greater explanatory power than the earnings equations previously used to handle this problem in the disability literature.

9. Stapleton, Coleman and Dietrich (1995) use aggregate state-time data from 1988 through 1992 to show that increases in the unemployment rate increased SSDI application.

10. Rupp and Stapleton (1996) examined the importance of controlling for the state unemployment rate on the estimated impact of the administrative climate on SSDI application by replicating Parsons (1991). Parsons (1991) did not include the state unemployment rate in his specification. Rupp and Stapleton (1996) replicated the Parsons (1991) study and include an additional specification with the state unemployment rate. Inclusion of the state unemployment rate, along with age effects,

cut the estimated elasticity of SSDI application with respect to the state SSDI denial rate by one-half.

11. Appendix Table 3 shows the life table estimates for men and women based on the year the condition first began to interfere with the person's ability to do their job. The risk of application is higher in the first three periods for men and in the first four periods for women following onset in Appendix Table 3 than in Table 3. Nonetheless, application does not immediately follow the onset of a disability when onset is measured at either the point the condition first began to bother the respondent or the point at which the condition first interfered with the respondent's work.

12. We find similar results using the year that the condition first began to interfere with work as the starting point for the analysis. However, for men, the relationship between the state allowance rate and first application for SSDI benefits becomes more apparent. Appendix Table 6 shows that the difference in the mass of the distribution above the intersection is larger and statistically different at the 5 percent level of significance. For women, the difference is slightly smaller, but it is still statistically significant at the 10 percent level.

13. The tables using the year the health condition first began to interfere with workers as the year of onset yielded similar results. These tables are available from the authors upon request.

14. This specification is similar to that used in Burkhauser et al (Forthcoming) but adds the initial state allowance and the state unemployment rate to their specification. It

also includes an additional health measure for the presence of three or more conditions.

15. This suggests that there may be some unobserved systematic differences in the group of women who allowed their SSA records to be matched to the HRS data and those who did not. To examine the impact of differences between the sample of women who allowed their Social Security administrative records to be used and the sample that did not, we estimated a model using the sample that allowed their SSA earnings histories to be used. The sign of the coefficients were the same as those reported here and policy variables were statistically significant at the 5 percent level. The estimated marginal impacts were slightly larger using the sample that allowed their SSA records to be used. The results are available from the authors upon request.