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The Effect of the Disability Insurance Application Decision on the Employment of Denied Applicants[†]

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The literature focused on the interactions between social insurance programs and labor force participation (LFP) mostly analyzes the causal effect of benefits receipt of the Social Security Disability Insurance (SSDI). In these studies, denied applicants are of interest primarily as a control group. Bound (1989) pioneers the empirical approach of using the labor supply of denied SSDI applicants to estimate an upper bound on the potential labor supply of accepted applicants.

In the analytical approach of comparing the employment of accepted and denied SSDI applicants, there is an implicit assumption that the SSDI affects employment through the single causal pathway of receiving benefits. If the decision to go through the process of application itself affects the applicants—both the awarded and the denied—the negative effects of application on denied applicants is unaccounted for in such analysis. In this paper, I estimate the causal effect of the SSDI application on the labor supply of denied SSDI applicants.

Bound (1989, 1991) and Parsons (1991) discuss three ways in which the SSDI application process can influence the labor-market activity of denied applicants in the post-application period: (i) they may intentionally be out of the labor force as they plan to reapply; (ii) applicants who appeal their initial denial may intentionally be out of work while awaiting the decision of appeal in order to make their case stronger; or (iii) once the process is over, they may face increased difficulty in getting back to work due to human capital deterioration because they were out of the labor force for so long.

The estimate of the effect of SSDI application on employment that I provide in this paper is a combination of all these channels over the short run. Comparing the labor supply of the non-applicants of SSDI who are similar in observable characteristics to the denied SSDI applicants, I find that the employment of denied applicants at ages 50–58 is as much as 49 percentage points lower two to three years after the application. The causal effect is somewhat smaller: I estimate a 36 percentage point reduction using an instrumental variable approach that exploits the differential incentives for SSDI application across birth-cohorts and states. The loss of potential employment of the denied SSDI applicants is a welfare loss to the society that results due to their decision to go through the process of application.

I. Data and Sample Characteristics

A. *Data Compilation*

I use data from the Health and Retirement Study (HRS), a nationally representative longitudinal household survey of older Americans. Participants in the HRS are interviewed every two years. I use 11 waves of data from 1992 to 2012. The HRS has detailed self-reported information on SSDI application, award, reapplication, and appeal as well as a whole array of information on health, wealth, demographic and socioeconomic characteristics, and LFP status.

I merge the HRS with the Social Security Administration (SSA) administrative geographic identification data in order to determinate the state of residence of the individuals observed in the HRS. Using the SSDI allowance

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rate[1] data obtained from the SSA, each individual in my sample is matched to the appropriate SSDI allowance rate by geographic location, gender, and age.

B. *Selecting the Control Group*

I estimate the labor supply of workers of ages 50 to 58 two to three years from every integer age. As the unsuccessful applicants were denied because of putatively good health, the SSA essentially is treating them as capable of substantial gainful activity (SGA), like non-applicants in the labor force. Thus, all the non-applicants who have worked enough up to a given age to earn the work credit required to be insured under the SSDI program can be thought of as a control group for denied SSDI applicants—the treatment group in this paper.

However, researchers have provided evidence that some individuals with health shocks that may make them eligible for the SSDI benefits may not apply for it due to the "hassle cost" and "stigma cost" associated with the social insurance programs (Haveman, Jong, and Wolfe 1991; Benítez-Silva et al. 1999). I identify a subset of all insured non-applicants for SSDI who I argue have only slightly higher "hassle cost" and "stigma cost" at a given age than the denied SSDI applicants at that age.

The control group for the denied SSDI applicants filing applications at a given age between 50 and 58 comprises the individuals observed to be non-applicants of SSDI between the ages of 50 and 58, but who later filed SSDI applications for the first time on or after age 60. Researchers have shown that the employment and income of SSDI applicants start to decline as many as four to six years before the SSDI application (see, for example, von Watcher, Song, and Manchester 2011). Workers who eventually apply in their 60s are likely to have experienced health deterioration in their 50s, making them comparable to the denied SSDI applicants. This set of individuals in the control group have a "hassle cost" and "stigma cost" that is at least a little bit higher in their 50s, but not so high that application is never worthwhile, as they eventually applied in their 60s.

[1] The allowance rate is the ratio of number of SSDI applicants awarded benefits over the total number of applicants.

The rest of the non-applicants, those who never applied for SSDI at any age, must either have experienced no significant work-limiting health shocks or have had adverse health shocks that did not outweigh a high "hassle cost" and "stigma cost." This group of people who never applied for SSDI is much less comparable to the treatment group than those who applied in their 60s.

C. *Primary Sample for Analysis*

The sample used for analysis includes individuals whose labor supply is observed in HRS from age 50 to 61. Age 62 is the earliest age for claiming the Old Age and Survivor Insurance (OASI) benefits. To eliminate the potential confounding effect of OASI benefits on employment, labor force status is limited to age 61 or earlier for the analysis.

In the sample, there are 322 individuals who applied for the SSDI for the first time at any age between 50 and 58 and did not eventually receive benefits. The control group consists of 347 individuals who filed an SSDI application for the first time in their 60s. The denied SSDI applicants appear in the sample only once, at the time of their first SSDI application. The individuals in the control group are observed multiple times starting from the first time they are interviewed in HRS on or after age 50 and then in two-year intervals as long as they are in their 50s. The primary sample of analysis has 1,231 observations.

II. Identification Strategy

I estimate a model of labor supply using denied SSDI applicants and non-applicants of ages 50 to 58 of the following form:

$$y_i = X_i\beta + \gamma DI_i + v_i, \tag{1}$$

where y_i is the employment status of individual i measured two to three years after a reference age; X_i includes individual observable characteristics that may influence labor supply; $DI_i = 1$ if individual applied for the SSDI for the first time at the reference age but never received benefits; v_i is an error term. The parameter of interest in this paper is γ, which measures the average of the effect of SSDI application on post-denial employment rates in the short run over the application ages of 50 to 58.

If some unobserved factors, such as the severity of health shocks or the low opportunity cost of SSDI application, affect both labor supply and SSDI application decisions, then inference is biased while using observational data for analysis. I can rewrite equation (1) as the following:

$$y_i = X_i\beta + \gamma DI_i - s_i + \varepsilon_i, \tag{2}$$

where s_i represents unobserved factors, which are uncorrelated with any remaining idiosyncratic element, ε_i. If, $E[s_i|DI_i] \neq 0$, then estimating equation (2) using ordinary least squares (OLS) gives a biased estimate of γ. If $\gamma < 0$ and if the unobserved characteristics are positively correlated with the SSDI application decision, then OLS overestimates the magnitude of the coefficient on DI_i and provides an upper bound of the potential employment loss of the denied SSDI applicants.

To identify the causal effect of SSDI application on employment, I use an instrumental variable (IV) approach. I exploit the variation in the full retirement age (FRA) across different birth-cohorts, brought about by the Social Security Amendments of 1983, and the allowance rate of SSDI applicants at the Disability Determination Services (DDS) level to instrument the application decision of denied SSDI applicants in the labor supply equation.

A. *The Instrumental Variables*

The earliest claiming age for OASI benefits is 62. The OASI benefits at 62 depend on the FRA along with other characteristics such as income history. The higher is the FRA, the higher is the Social Security reduction factor applied to the primary insurance amount (PIA) to reduce the benefits at 62. However, the SSDI benefit, if awarded, is equal to the PIA calculated at the disability onset date with no actuarial reduction. Therefore, the FRA extension makes the SSDI relatively more generous than OASI at any given age—even before 62 if the individuals are forward-looking.

Duggan, Singleton, and Song (2007), and Li and Maestas (2008) find that the SSDI application rate is significantly higher for birth cohorts with later FRAs of men and women between the ages of 45 and 64, which suggests that the variation in FRA is a sufficiently strong instrument for the SSDI application decision in this paper. The crucial identifying assumption is that the differences in employment of the different cohorts associated with different FRAs are only due to their heterogeneous incentives to apply for SSDI after controlling for observables.

I define an indicator for more generous states by exploiting the variation of the aggregate allowance rates of SSDI across states and over time within a state that is exogenous to the labor supply of individuals. Assuming that people do not choose their state of residence on the basis of SSDI allowance rate of the DDS office of that state, I argue that the measure of generosity across states and over time within a state exogenously determines the outcome of SSDI application. The less stringent the state's DDS office is, the lower the probability that an applicant would be denied benefits (all else equal.)

To identify the causal estimate of γ, I instrument the indicator variable DI_i in equation (2) and estimate the model using two-stage least squares (2SLS) technique. The first stage of the two-stage instrumental variable model can be written as:

$$DI_i = \lambda X_i + \delta Z_i + \eta_i, \tag{3}$$

where Z_i includes a vector of indicators accounting for the gradual change in the FRA by birth cohorts as well as an indicator variable for individuals living and applying for SSDI in states that are less stringent in awarding the SSDI benefits. η_i is an idiosyncratic error.

III. Empirical Results

Table 1 presents the regression estimates of the labor supply model specified above using OLS, 2SLS, as well as the estimates of the first stage of the 2SLS. The estimates of the first stage show that compared to the birth-cohorts with FRA equal to 65, the cohorts with FRA more than 65 and less than 66 are 3 percentage points more likely to be denied SSDI applicants; however, the estimate is not statistically significant. Compared to those with the FRA at 65, cohorts with their FRA equal to or higher than 66 are 17 percentage points more likely to apply unsuccessfully to SSDI, an estimate that is significant at the 1 percent level. The estimated parameter of the indicator for relatively less stringent states is -0.02, which has the expected negative sign, but is not statistically significant. The first stage

Table 1—SSDI Application Decision and Effect on Employment

	First stage	OLS	2SLS
Denied SSDI applicant		−0.49	−0.36
		(0.03)	(0.20)
I(65 > FRA < 66)	0.03		
	(0.05)		
I(FRA ≥ 66)	0.17		
	(0.05)		
Less stringent state	−0.02		
	(0.03)		
Observations		1,231	
R^2	0.28	0.41	0.39
F-statistic of the weak identification test	9.84		
Critical value for max 10% bias of weak identification test	9.08		
Overidentification test (p-value)			0.57

Notes: Robust standard errors are in parentheses, which account for clustering at the individual level. The regression parameters represent marginal probabilities estimated using a linear probability model (LPM). The regressions include demographic, health, socioeconomic, and state level controls as well as age and state fixed effects.

is fairly strong, with 28 percent of the variation of SSDI application explained by the model. The results of the weak identification test show that I can reject the null that the first stage is weakly identified at the 10 percent level.

The OLS estimate in Table 1 represents the estimate of the upper bound of the effects on employment of SSDI application on denied applicants. It shows that the potential loss of employment of the denied SSDI applicants is at most 49 percentage points. The IV (2SLS) estimate of Table 1 represents the causal estimate of the effect on employment of the application decision of the denied SSDI applicants. It shows that the SSDI application decision causes a 36 percentage point decrease in the employment of denied SSDI applicants of ages 50 to 58 two to three years after filing the application. The p-value of the overidentification test is sufficiently large, implying that the null hypothesis, that the overidentification restrictions are valid, cannot be rejected.

IV. Conclusions

In the United States the denial rate of SSDI applications, combining at all adjudicative levels, has risen from 45 percent in 2000 to 72 percent in 2013. The denial rate for medical reasons at the medical adjudicative level has also risen from 38.3 percent to 49.6 percent during this time period. In absolute terms, the number of applicants has doubled during that time period; about 1.8 million applicants were denied the SSDI benefits in 2013 (SSA 2015). More people than ever are applying for disability benefits, removing themselves from the labor market for months or even years, and then being forced to re-enter when they are denied enrollment.

I find that the post-application employment of denied SSDI applicants of ages 50 to 58 is reduced by 36 percentage points in the short run. The findings of this paper suggest that the process of SSDI application causes a substantial loss of employment potential to the denied applicants. Given that the number of SSDI applicants who are ineligible for the program is increasing over the years, the employment loss to society is growing as a result. The magnitude of the effect is so significant that it suggests that policymakers revisit the disability determination process to make it shorter and make reforms to reduce the work disincentives that occur when applying and waiting for SSDI determination.

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