

Earnings of Rejected Applicants to the Social Security Disability Insurance Program

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Abstract: Several studies bound the potential earnings of accepted disability applicants by the post-application earnings of rejected applicants, premised on the notion that the latter are healthier than the former. This study shows that, although rejected applicants are healthier, they also have lower educational attainment and earnings prior to application. To address these differences, this study weights the pool of rejected applicants to approximate the composition of accepted applicants. As shown, the post-application earnings of rejected applicants are similar regardless of weighting.

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1. Introduction

The growth of the Social Security Disability Insurance program has raised the concern that many enrollees can work.¹ In a seminal study by Bound (1989), the potential employment of accepted applicants is bounded by the observed employment of rejected applicants, premised on the notion that rejected applicants are healthier and therefore more capable of work. Using survey data from the 1970s, Bound finds that fewer than 50 percent of rejected applicants are employed, suggesting that fewer than half of accepted applicants could work had they been denied. Researchers von Wachter, Song and Manchester (2011) derive similar conclusions using similar methods, but using data from the 1980s, 1990s, and early 2000s.

An objection to this method, as Bound notes, is that factors other than health may account for the low employment of rejected applicants. In particular, although rejected applicants may be healthier, they may also be less educated or less motivated to work. If so, the earnings of rejected applicants may understate the potential earnings of accepted applicants.

To address this objection, Bound shows that education and pre-application earnings do not differ substantially between accepted and rejected applicants. However, the difference in pre-application earnings is greater among more recent applicants (Lahiri, Song and Wixon 2008; Giertz and Kubik 2011; Singleton 2011). **Figure 1** plots the final award rate by pre-application earnings using male SSDI applicants in 1994.² As shown, high pre-application earnings are associated with a greater likelihood of award, which ostensibly reflects poorer health at the time of application. The figure does not imply that accepted applicants could earn more than rejected applicants had the accepted been rejected, as pre-application earnings may pre-date disability

¹ Autor and Duggan (2006) discuss the growth in the Social Security Disability Insurance program.

² Throughout, pre-application earnings are the average earnings in years 1991, 1992 and 1993 expressed in real 1994 dollars.

onset; but the figure does imply that employment histories differ between accepted and rejected applicants. Thus, in the recent context, the question remains whether the earnings of rejected applicants understate the potential earnings of accepted applicants.

To address this issue, this study reweights the pool of rejected applicants to approximate the composition of accepted applicants.³ On one hand, the weighted earnings of rejected applicants may be greater than un-weighted earnings, as more weight is placed on higher education and pre-application earnings. On the other hand, the weighted earnings of rejected applicants may be lower, as education and pre-application earnings are associated with poorer health. As shown, these factors counteract each other, so that the weighted earnings of rejected applicants are similar, if not lower, than un-weighted earnings.

2. Materials

2.1 Data

Data on SSDI applications comes from the Social Security Administration's Disability Research File (DRF). The DRF contains information on claims at the initial and reconsideration levels - the latter being the first level of appeal – and limited demographic information about the applicant. The data also report annual earnings from 1980 to 2003 up to the social security taxable maximum, which was \$60,600 in 1994. Earnings data come from W-2 forms filed with the Internal Revenue Service.

The version of the DRF for this study contains a ten percent sample of disabled worker applications filed within the United States in 1994. Initially, the file contains 137,364 applications. Applications are excluded if denied due to collateral estoppel or ineligibility. The

³ This strategy differs from Chen and van der Klaauw (2008), who also attempt to derive more comparable groups, but must focus on appellants around 55 years of age.

data are also restricted to applicants aged 25 to 64, to applications that do not proceed to the Office of Hearings and Appeals level, and to applicants whose administrative records do not indicate death prior to application. The analysis focuses on male applicants, as related studies do, and to applications with administrative data on race. The analysis sample contains 50,117 applications.

2.2 Data Summary

The opportunity cost of benefit receipt includes the value of employment in the labor market. In a model of disability demand (Singleton 2010), the value of employment is a function of both health capital and human capital more generally. Both forms of capital increase the value of employment; the difference is that health capital is only useful in good health.⁴ The model predicts that, due to selection into the applicant pool, health and general capital are negatively correlated among applicants.

The negative correlation between health and general capital is evident in **Table 1**. Health and general capital are measured by mortality and education, respectively. (Only 86.7 percent of applications have information on education, but the summary statistics are similar between all applications and those with information on education.) As shown, applicants with a college are more likely to be deceased within two years after application, despite having higher earnings before application.⁵

The negative association between health and general capital among applicants suggests that accepted and rejected applicants differ in fundamental ways. In particular, while rejected applicants should be healthier, they should also have lower general capital. This pattern is

⁴ The relationship between health and general capital are discussed further in Charles (2003).

⁵ The positive relationship between education and mortality is robust to controls for age, its square, race, state-of-residence fixed effects and sixteen diagnostic-code fixed effects.

evident in **Table 2**, which presents summary statistics by the final award decision.⁶ As shown, while rejected applicants are less likely to be deceased within two years of application, they are also less educated and have lower pre-application earnings.

3. Methods, Results and Discussion

The differences between rejected and accepted applicants in **Table 2** suggest that rejected applicants are not directly comparable to accepted applicants. To address this issue, this study re-weights the pool of rejected applicants to approximate the composition of accepted applicants. The weights are positively associated with the likelihood of benefit award, which is estimated using a logit model. The model controls for age, its square, race (black and other relative to white), educational attainment (less than a high school diploma and a high school diploma relative to a college degree), pre-application earnings (an indicator of earnings greater than the 50th percentile), state-of-residence fixed effects and sixteen diagnostic-code fixed effects. The results (not shown) reveal that the likelihood of award increases with age and educational attainment and decreases with being non-white.

Based on specific assumptions, the predicted probabilities of award can be used to estimate the counterfactual earnings of accepted applicants had they been rejected.⁷ In particular,

$$E[Y_i^0 | A_i = 1] = E[w(x_i)Y_i | A_i = 0].$$

⁶ If applicable, the final decision reflects the decision at the reconsideration level rather than the initial level.

⁷ In this context, the assumptions are that benefit award is random conditional on covariates and that there is a comparable rejected applicant for every accepted applicant.

The left side represents the counterfactual earnings of accepted applicants, and the right side is the reweighting estimator using propensity score weights $w(x_i)$ (Kline 2011). The propensity score weight is given by:

$$w(x_i) = \frac{1 - \pi}{\pi} \frac{P(A_i = 1|x)}{1 - P(A_i = 1|x)}.$$

The term $\pi \equiv P(A_i = 1)$ is estimated from the full sample, and $P(A_i = 1|x)$ is estimated from the logit model of disability award.⁸

Figure 2 plots weighted and un-weighted earnings trends of rejected applicants during five years before and after disability application. Panel A plots the percent of applicants with any earnings; panel B plots earnings in levels. For comparison, the figure also plots earnings of accepted applicants. As expected, prior to application, the un-weighted earnings of rejected applicants are lower than the earnings of accepted applicants. Three years after application, in 1997, only 58.7 percent of rejected applicants had positive earnings.

There are two points to note about the earnings of rejected applicants once weighted. First, prior to application, the earnings are similar between rejected and accepted applicants, assuring that the weighted pool of rejected applicants is more comparable to accepted applicants. And second, after application, the earnings of rejected applicants are similar, if not lower, than the un-weighted earnings of rejected applicants. The results likely reflect that, although more weight is placed on higher general capital, higher general capital is associated with poorer health.

4. Conclusion

Due to selection in the applicant pool, the post-application earnings of rejected applicants may not be an appropriate upper bound for the earnings of accepted applicants. To derive an

⁸ In practice, the weights should be normalized to sum to one (Imbens 2004), which is done here.

alternative bound, this study re-weights the pool of rejected applicants to approximate the composition of accepted applicants. As shown, the post-application earnings of rejected applicants are similar regardless of weighting. Thus, although rejected and accepted applicants are different, an attempt to address these differences yields similar conclusions about the potential employment effects of the Social Security Disability Insurance program.

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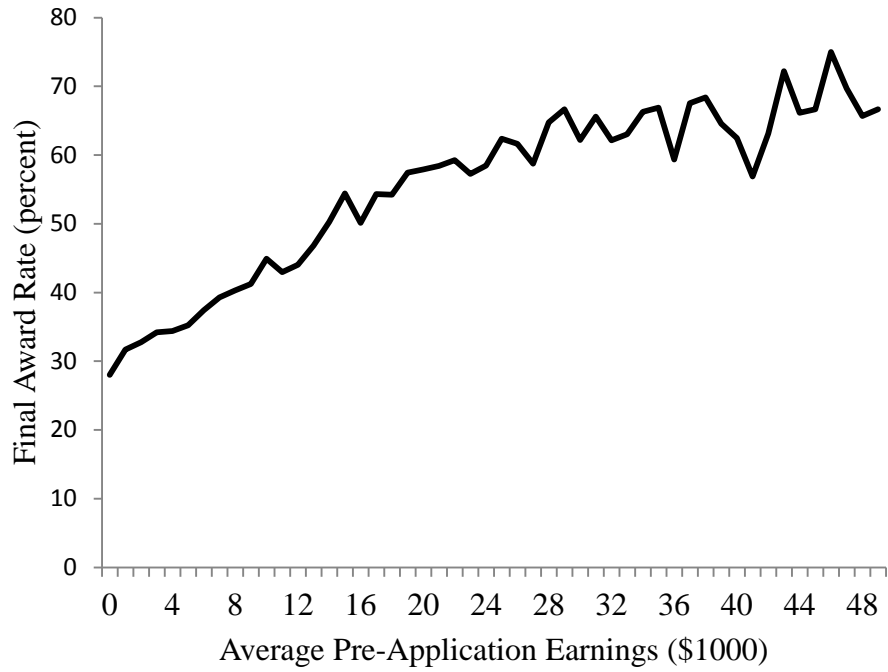
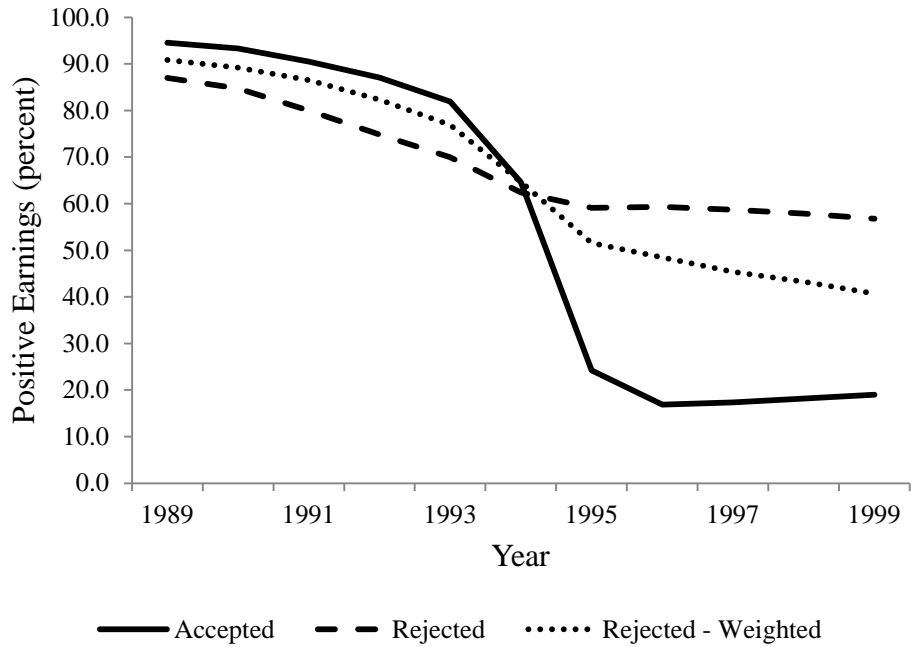
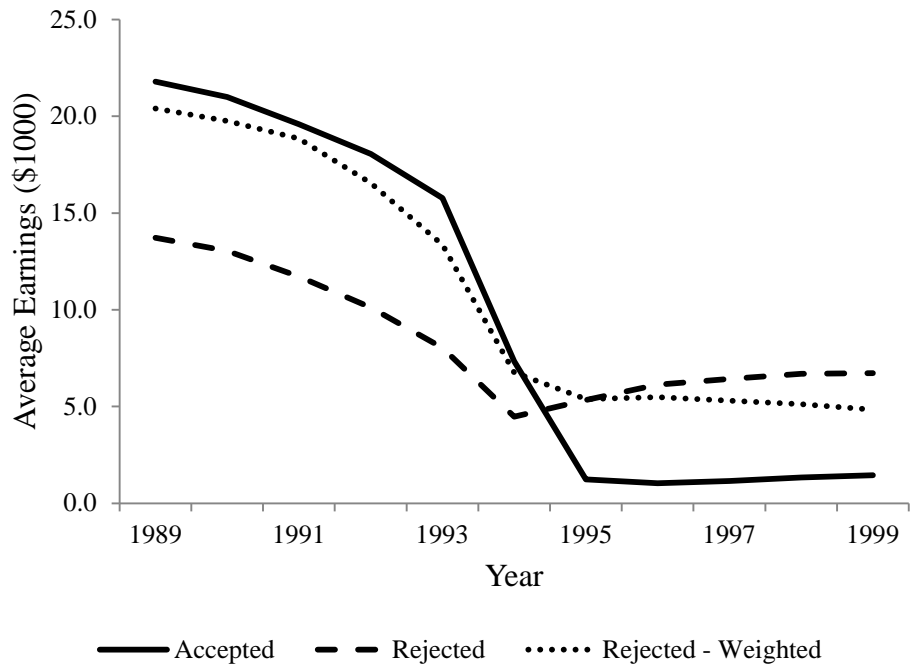


Figure 1: Final SSDI Award Rate by Average Pre-Application Earnings: Males Ages 25 to 64



Panel A: Positive Earnings



Panel B: Earnings

Figure 2: Earnings Trends of SSDI Applicants by Final Award: Males Ages 25 to 64
The weights used to construct the “Rejected – Weighted” trend are positively associated with the likelihood of award.

Table 1**Summary Statistics of SSDI Applicants by Education: Males Ages 25 to 64**

	Education				
	All	All	Less Than High School	High School Diploma	College Degree
Death in two years	11.2	10.9	8.9	11.3	18.9
Award initial	44.7	44.1	42.6	43.2	59.7
Award final	49.9	49.9	48.3	49.1	65.8
Age 45 to 64	53.5	53.7	58.4	49.1	65.8
Race: Black	21.7	21.7	24.7	20.9	10.5
Race: Other	7.5	7.1	8.8	5.9	6.6
Pre-application earnings (\$1000)	13.8	13.9	10.7	14.8	24.5
Musculoskeletal	20.1	20.2	21.8	20.4	10.2
Cardiovascular	13.2	13.5	14.7	12.6	14.7
Mental Disorder	20.7	20.7	20.5	20.7	22.2
Infectious Disease	5.6	5.2	3.0	6.0	11.3
Observations	50,117	43,464	16,561	24,030	2,873

Source: Author's calculations using the Disability Research File.

Note: The data are restricted to male disabled worker applicants who filed in 1994 within the fifty United States. The figures exclude applications that were denied due to collateral estoppel or a technicality or that do not report race. Figures are in percent unless otherwise noted. Pre-application earnings are average earnings in years 1991, 1992 and 1993 expressed in 1994 dollars.

Table 2**Summary Statistics of SSDI Applicants by Final Award: Males Ages 25 to 64**

	Rejected	Accepted
Death in two years	2.1	19.7
Age 45 to 64	38.9	68.6
Race: Black	26.5	16.8
Race: Other	9.3	4.8
Less than High School Diploma	39.3	36.9
High School Diploma	56.2	54.4
College Degree	4.5	8.7
Pre-application earnings (\$1000)	10.0	17.8
Musculoskeletal	27.4	13.1
Cardiovascular	9.6	17.5
Mental Disorder	20.4	21.0
Infectious Disease	2.2	8.2
Observations	21,779	21,685

Source: Author's calculations using the Disability Research File.

Note: The data are restricted to male disabled worker applicants who filed in 1994 within the fifty United States. The figures exclude applications that were denied due to collateral estoppel or a technicality or that do not report race. Figures are in percent unless otherwise noted. Pre-application earnings are average earnings in years 1991, 1992 and 1993 expressed in 1994 dollars.