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**The Employment Effects of Social Security Disability Insurance in the Past 25 Years:
A Study of Rejected Applicants Using Administrative Data**

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The Employment Effects of Social Security Disability Insurance in the Past 25 Years:

A Study of Rejected Applicants Using Administrative Data[1]

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Abstract

We use administrative longitudinal data on earnings, impairment, and mortality to replicate and extend Bound's seminal study of rejected applicants to federal Disability Insurance (DI). We confirm Bound's main result that rejected older male applicants do not exhibit substantial labor force participation. We show this result is stable over time, robust to more narrow control groups, and similar within gender, impairment, industry, and earnings groups. However, we also find that younger rejected applicants have substantial employment after application. To what extent this translates into potential employment for new beneficiaries depends on which group among them is considered "on the margin" of receiving DI. If we use initially rejected applicants – a large and growing fraction of new beneficiaries – the resulting counterfactual employment rate for younger applicants is low, too. We also find that rejected applicants bear signs of economically induced applicants. DI appears to induce a growing number of less successful workers to apply, an important fraction of which ends up without benefits and non-employed.

1. Introduction

There have been large and continuing increases in the number of individuals receiving federal Social Security Disability Insurance (DI) since the system was conceived in its current form in the 1950s and 1960s. During the same period, labor force participation of older and lower-skilled men has fallen steadily, with a slow-down only in the 1990s. These parallel developments have led to the recurring questions of whether the generosity of DI induces low-income workers to apply for and sometimes receive benefits, and whether these individuals would work in the absence of DI.[1] To obtain an estimate of the potential labor force attachment of new DI beneficiaries in the absence of DI, Bound (1989) suggested using employment of rejected DI applicants as a counterfactual. Bound's argument was that rejected applicants are more similar to new beneficiaries than the typical worker, but are also likely to be in better health; thus, their labor force attachment constitutes an upper bound for employment behavior of new beneficiaries. Using data covering the mid to late 1970s, Bound (1989) found that the employment rate of older male rejected DI applicants was quite low.[2] This suggests few new beneficiaries would be expected to work in the absence of DI.

Since Bound's seminal analysis, the federal DI system has undergone significant changes. Reforms of the process of determination of eligibility starting with the 1984 Amendments have made the screening process more favorable to applicants and made the system more accessible for individuals suffering mental health conditions. During the same period, the labor market prospects of low-skilled workers have declined. Partly as a result of these changes, the number of new beneficiaries has increased rapidly during the 1980s and 1990s; applicants and new beneficiaries have become younger, healthier, and more likely to suffer from back pain and mental health problems (e.g., Duggan and Imberman 2006). Similarly, we show that average earnings of applicants have

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[1] See, e.g., Bound and Burkhauser (1999) for a description of the trends in disability, DI receipt, and labor force participation, as well as a summary of the main recurring themes of the literature.
[2] Bound (1989) focuses on male applicants age 45-64 since this constituted the majority of applicants in the 1970s.

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fallen, especially during the mid-1980s. The question as to whether workers are induced to apply to DI because of economic conditions and perhaps leave the labor force as a result is thus more pressing than ever (e.g., Autor and Duggan 2006). However, the increasing heterogeneity within the group of applicants makes it more difficult to find an appropriate counterfactual for potential employment behavior of new beneficiaries. Similarly, the changing composition of applicants and the shifts in the DI system imply the original analysis by Bound (1989) needs to be updated.

In this paper, we replicate Bound's analysis for older male DI applicants for the 1980s and 1990s and extend it to encompass younger workers and women. We merge several administrative data sources providing us with detailed longitudinal information on earnings, impairments, and mortality of new DI beneficiaries, rejected DI applicants, and non-applicants covering the period from 1978 to 2004. The data allow us to deepen Bound's original analysis in several ways; we can assess whether our main comparison is robust to using workers with very similar characteristics to generate counterfactuals; we can study differences by key groups (e.g., impairment groups); and we can analyze earnings and employment dynamics before and after application. Access to administrative data also leads us to exploit institutional features of the application process to provide a tighter bound on labor force participation in the spirit of Bound (1989).

Our results confirm Bound's (1989) finding that rejected male applicants age 45-64 have weak labor force attachment; in fact, despite differences in the nature of the data, for the early 1980s our numbers are very similar to his. This finding is very stable over time despite large changes in the DI system. It also holds for female applicants and within impairment, industry, or earnings groups. Similarly, it is not altered when we control for the systematic ex-ante differences between new beneficiaries and rejected applicants that we find. If we were to use employment of rejected applicants as an upper bound, we would predict little labor force attachment in the absence of DI for the traditionally largest group of beneficiaries.

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We also find that younger rejected applicants, whether male or female, continue to have reduced but substantial labor force attachment after application to DI. Again, this result is stable over time and very robust across sub-groups. Since the average age of applicants and new beneficiaries has been declining over time, this finding has potentially important implications. To assess how high implied potential employment rates for younger new beneficiaries are, we can use our data to isolate the fraction of new beneficiaries whose application was initially rejected and use it as estimate of beneficiaries who were "on the margin" between receiving and not receiving DI.

A large and increasing fraction of applicants who are initially rejected in the administrative adjudication of their claim is later awarded benefits through judicial review. The loss in earnings potential and health condition of these applicants is not deemed to be sufficiently strong during the initial screening of their case. We show that the mortality rate of these new beneficiaries is very similar to that of finally rejected applicants and much lower than immediately accepted new beneficiaries. We argue it is this group to which the counterfactual employment behavior of rejected applicants is most likely to apply. If we apply Bound's counterfactual to the fraction of those new beneficiaries who were initially rejected, the potential employment rate of new beneficiaries is on the lower side for younger individuals as well.

Last, we find that the rejected applicants and to some extent initially rejected new beneficiaries bear some signs of workers who have been induced to apply to DI because of worsening economic conditions. The average earnings prior to application of both of these groups has been declining, especially in the early to mid 1980s; we also find average pre-application earnings and employment of rejected applicants is considerably lower than that of new beneficiaries; this gap widens significantly in the years just prior to application, especially for older applicants.

These findings contribute to two questions that have motivated an important and growing literature. First, our results speak to the question of whether a substantial fraction of new

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beneficiaries would be in the labor force in the absence of DI. We significantly extend Bound's original analysis to show that his results for older male applicants are stable over time, robust to the use of much more detailed control groups, and similar between impairment groups. However, we also show that the changing decomposition of DI applicants is likely to change Bound's original conclusion that DI is unlikely to reduce labor force participation. This answer will depend on potential employment behavior of younger new beneficiaries, and which among these are deemed more likely to be "on the margin" of working.

Second, our findings confirm that DI appears to induce some workers to apply because of adverse economic conditions (e.g., Stapleton and Rupp 1995, Autor and Duggan 2003). We are the first to study pre-application employment and earnings dynamics to show that rejected applicants bear characteristics of workers with difficult labor market status. Our results suggest for male applicants of all ages this pattern became stronger in the mid 1980s. Among new beneficiaries, especially those initially rejected but later allowed appear to be increasingly less economically successful and healthier. To better understand the labor market effects of federal DI, further examination of these groups is likely to yield important insights.

The outline of the paper is as follows. In the next section, we analyze employment and earnings of rejected older male DI applicants and contrast it to that of non-applicants; we first compare our results to that of Bound (1989), and then study the evolution of employment before and after application and over time; we also compare workers with very similar prior employment histories to assess the robustness of the results to pre-application differences in employment and earnings. In the third section, we replicate these results for younger workers and for women. In the fourth section, we study different earnings, industry, and impairment groups, while in the fifth we present regression results that control for prior earnings, age, and year effects. In the sixth section, we analyze characteristics of initially rejected new beneficiaries. We then use these workers to

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present alternative counterfactual employment rates. In section seven, we summarize the role of changes in the age-decomposition of new beneficiaries on the potential employment of DI recipients implied by Bound's counterfactual exercise. The last section concludes.

2.   Employment and Earnings of DI Applicants from 1978 to 2004 – Older Men

To study the economic outcomes of applicants to DI, we merged several administrative data sources. The first is a 1% sample of all initial applications to DI from 1978 onwards. This file contains information on the application (such as age, gender, education and impairment of the applicant) as well as information on the decision up to the reconsideration phase.[3] Since many applications are decided in later stages of the decision process, to obtain information on whether applicants actually received DI, we merged on final benefit receipt from SSA's Master Beneficiary Record (MBR).[4] This allows us to identify applicants who were awarded benefits immediately, those whose claims were finally rejected, and those who were initially rejected but eventually received benefits. Since the application status of the first two applicant groups is relatively unambiguous, we will limit our main analysis to initialyl allowed (termed "new beneficiaries") and finally rejected applicants.[5] We will return to the intermediate group below.[6]

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[3] The 831 File only contains information on all new applications to DI; there is no information on repeated applications or applications decided in the judicial part of the review process.

[4] The so-called 831 File was merged to the MBR, the MEF, and the Numident at the Social Security Administration using Social Security Numbers, gender, and age. For a more detailed description of these data sources and the merge see our longer predecessor paper Von Wachter, Song, and Manchester (2007a).

[5] This classification of rejected applicants comes close to that used by Bound (1989); he classifies as new beneficiaries individuals that are receiving DI benefits, and as rejected applicants those reporting to have at some point applied and that are currently not receiving benefits (see his footnote 12). Since on average workers in his data have applied to DI four years prior to the survey, the majority of rejected applicants are likely to be final rejections.

[6] Unfortunately, we do not know at which stage beyond the administrative reconsideration stage an initially rejected applicant eventually got awarded benefits; similarly, we do not know at which stage a denied applicant accepted the rejection. We define an application to be "rejected" if a worker does not receive benefits within ten years of his first application. For those rejected initially, we do not know whether they appealed their decision in the judicial phase of the reconsideration or whether they reapplied. Some of initially rejected applicants may thus return to work prior to reapplication.

The information on employment and earnings we use is derived from uncapped annual

salaries recorded on workers' W-2s and contained in SSA's Master Earnings File (MEF). A worker is

called employed if he or she has any positive earnings in a given calendar year. This is likely to

understate employment, since we miss non-W-2 sources of labor income, chiefly self-employment

income.[7] In Table 1, we use the merge between different administrative data sets to replicate as

closely as possible the main table of Bound's (1989) seminal analysis (his Table 2). The first columns

of Table 1 show our employment measure for workers applying to DI in 1982. To be comparable

with Bound, we limit ourselves to male applicants age 45 to 64 in 1982. The table also shows our

measure of employment for a 0.2% random sample of male workers in the same age range drawn

from the MEF.[8] Two years after application, only 40.4% of rejected applicants have any positive

earnings. Since we do not have information on hours worked, we also show the fraction of workers

with earnings above a minimal threshold (defined as one quarter's worth of full-time earnings at the

2000 minimum wage). Only 31.6% of rejected applicants have earnings beyond the minimal

threshold, compared to 70.2% of non-applicants.[9] These numbers are of similar magnitude as the

fraction of rejected applicants that were found working in Bound's study.[10]

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[7] For a detailed discussion of earnings information from the Master Earnings File see Kopzcuk, Saez, and Song (2007).

[8] We restricted applicants and non-applicants to be insured by DI. In addition, to ensure a minimal attachment to the labor force (chiefly for the non-applicants), we required all workers to have any amount positive earnings at least once in 1978 to 1981. This restriction has no bearing on our results, and mainly affects the employment level of non-applicants. The year 1982 was chosen to have a minimal amount of information on earnings prior to application. This also avoids using the MEF years 1978-1980 too heavily in our analysis, which have a high fraction of imputed values (see Kopzcuk, Saez, and Song 2007).

[9] In results not shown, we found that these patterns in Table 1 and Figure 3 hold if we exclude workers above age 54 and are thus not simply driven by retirement.

[10] An exact comparison is made difficult by the different nature of the data. In Bound's *1978 Survey of Disability and Work*, 69.3% of the population reported being employed at the survey date, whereas 86.7% reported having worked at some point in 1977; among rejected applicants, 28.7% reported being employed at the survey date, and 40.4% report having worked at some point in 1977. Since labor force participation rates for older men were falling during the period, the fraction with positive earnings in 1984 is expected to be lower than 86.7%, but perhaps not as low as 73.3% (given the small fraction of applicants, the fact that we use non-applicants instead of an estimate of the population has little bearing on the comparison). The understatement is likely due to the absence of self-employment earnings in our data. This may also lead us to understate somewhat employment of rejected applicants, but this is unlikely to affect our overall conclusions.

In addition to employment, Table 1 also shows average annual earnings and median positive earnings for rejected applicants. Median earnings of rejected applicants are an order of magnitude lower than that of non-applicants. As we will see below, this is in part due to significant earnings differences existing prior to application. However, the earnings loss for rejected applicants during application is still very high. Two years before to two years after application, the difference in average earnings is between 40% and 50% (not taking into account earnings trends for non-applicants).[11] The low earnings and large earnings losses confirm the results in Bound (1989) that rejected older male DI applicants have a low degree of labor force attachment, especially relative to non-applicants. The non-trivial amount of employment among initially rejected new beneficiaries fades and is likely to be due to our way of dating DI receipt (see the last section and Appendix figure 6).

In keeping with Bound (1989)'s main table, Table 1 also reports limited information on demographics available from the administrative data. Median age of rejected applicants is 55 years, slightly younger than new beneficiaries and older than non-applicants. Rejected applicants are more likely to be non-white, and less educated (available only starting in 1987).[12] As discussed at the outset, glancing across columns, the table confirms that from 1982 to 1992 applicants have become younger and are increasingly more likely to be non-white. This holds for all applicants, but also within the group of older men.

The administrative data do not contain information on the health status of applicants. However, we were able to merge individuals' date of death from the Numident file maintained by

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[11] See Figure 3 for average earnings including zeros, and Appendix figure 4 for the median of positive earnings. Note that in 2000 dollars, median 1977 earnings for the population in Bound's Table 2 would be $39,000 (using CPI inflation published by the Bureau of Labor Statistics), similar to what we find for non-applicants. The same figure is $14,840 for rejected applicants, which is higher than what we find. These differences could well be part of a secular decline in average (pre and post application) earnings we find for rejected applicants, and may arise from changes in the DI system during that period (see von Wachter, Song, and Manchester (2007a). The difference does not affect the overall similarity of our findings for older men with the results in Bound. The low incidence and amount of positive earnings we find for new beneficiaries is also close to that reported in Bound.
[12] Information on education is available only for DI applicants from the 831 file.

the Social Security Administration.[13] The evidence from death rates confirms Bound's conclusion

that rejected applicants are less healthy than the overall population; their death rate two years after

initial application to DI is a little less than double the rate for non-applicants. The lower health

status is not surprising since they are more likely to be drawn from a population with low earnings,

low education, and less likely to be white. However, as in Bound, the table also shows that they are

in much better health than new beneficiaries, among whom a large fraction dies within four years of

application. The annual mortality rate of rejected applicants increases smoothly with age.[14] Glancing

across columns, the table confirms evidence that mortality rates of applicants have been falling over

time, especially in the 1990s.

The difference in mortality between allowed and rejected applicants can be attributed in part

to differences in the distribution of impairments recorded on the DI application. In Table 1, we

grouped and listed information on the primary impairment code – available on a consistent basis

starting in the mid-1980s – to be as comparable as possible to the self-reported health conditions

reported in Bound.[15] The majority of applicants apply for DI due to health conditions in the

musculoskeletal system (e.g., back problems), circulatory system (e.g., cardiovascular diseases),

mental disorders, and neoplasms (e.g., cancer). Rejected applicants are much less likely to have

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[13] This file contains information on date of death for individuals with a valid Social Security number. Its coverage is considered reliable starting from the late 1970s and is better for men and older individuals (see Hill and Rosenwaike 2002).

[14] The difference in annual mortality rates between new beneficiaries and rejected applicants is high in the first five to six years after application and then fades (see Figure 6). As a benchmark, the annual mortality rates for male workers in Pennsylvania age 55 born around 1930 with stable attachment to the labor force from 1974 to 1979 is about 1% (von Wachter and Sullivan 2007). Over three years (from 1982 to 1984) this leads to a cumulated death rate of 3%. This is a bit lower than what we see in the first column of Table 1 for non-applicants with much weaker labor force attachment (whose average age is 54.6), but within the same ballpark.

[15] In contrast to Bound who allows multiple impairments per person, we only record the main impairment on the DI application (i.e., we do not use information from the secondary impairment code available in the administrative data). The advantage of the administrative data is that the impairment is presumably documented by medical examination and thus on more solid grounds. On the other hand, in response to administrative requirements it may not fully correspond to the actual health status of an individual. Comparing our impairment distribution to Bound's, the relative ranking is similar with the exception of conditions relating to the respiratory and digestive system; this may be due to the different time period (1986 vs. 1977) and because some of these conditions may be less frequent as primary impairment classes.

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cancer or circulatory problems, two impairments with high mortality rates. As further discussed below, beneficiaries who initially rejected are much more likely to have musculoskeletal conditions than applicants awarded benefits immediately, leading them to have much lower mortality rates as well.

Overall, a highly similar picture emerges for older men applying to DI in 1982 as found in Bound (1989) for the late 1970s. Rejected applicants have limited attachment to the labor force and low earnings. They are more likely to be nonwhite, are younger, and are less skilled than new beneficiaries. They are also healthier than the majority of new beneficiaries, but less healthy than the overall population. Thus, were employment and earnings of rejected applicants to be taken as an upper bound for the potential behavior of new beneficiaries in the absence of DI, their predicted labor force attachment would be at best weak.

However, as discussed at the outset, since the late 1970s there have been strong changes in the administration and rules governing federal DI; during the same time, the number of older men applying to DI has increased (Figure 1, Panel A), and they have become younger and healthier.[16] Using the longitudinal nature of our data we can also show that they have become poorer over time. Figure 2 (Panel A) displays average annual earnings in the five years before application for all applicants, all new beneficiaries, and finally rejected applicants. With the exception of a rebound during the DI retrenchment in the early 1980s, average earnings of DI applicants and in particular of rejected applicants has declined in the early to mid-1980s. It is natural to ask whether these changes in characteristics have had an impact on the employment behavior of rejected DI applicants.

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[16] Figure 1 displays the number of applicants, all new beneficiaries, and finally rejected applicants in our sample for men by age-group; the corresponding numbers for women are shown in Appendix Figure 3. Note that Figure 1 and 2 display age up until 54 for the older age-groups instead of age 64; the pattern are very similar once the older age-group is included (the figures were being generated when the working paper went into press for the RRC conference).

Table 1 shows our measures of employment and earnings after application for male applicants age 45-64 in 1987 and in 1992. The table suggests at best minor changes in the fraction of rejected applicants with any or minimal annual earnings that may be well be attributable to fluctuations in single calendar years. Median earnings of rejected applicants have declined from 1982 to 1987, and have since then remained essentially unchanged. The change is likely to correspond to the general trend in average pre-application earnings of rejected applicants noted in Figure 2, rather than reflecting a significant change in post-application labor force attachment. The *change* in employment and earnings at application has remained stable over time.

To abstract from fluctuations in single years and to show the entire dynamic pattern of employment and earnings before and after application, Figure 3 displays the evolution of average labor force attachment for workers applying in 1982-1987, 1987-1992, and 1992-1997, respectively.[17] Panels A and B focus on older men and contain several important results. First, averaging over multiple application cohorts confirms a low degree of employment and earnings for rejected applicants; at best, it appears evidence from single years in Table 1 tends to overstate participation. Second, employment and earnings after rejection are surprisingly stable over time. The most apparent change is the reduction in pre-application earnings of rejected DI applicants we already noted in Figure 2.[18] With this exception, employment and earnings of new beneficiaries and rejected applicants have remained virtually unchanged, at least since the early 1980s. The evidence in Bound suggests the pattern was similar in the late 1970s as well.

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[17] Again, we focus only on applicants that were either awarded benefits immediately or finally rejected, postponing the discussion of the more ambiguous initially rejected beneficiaries. The age restriction in the figures still refers to the baseline year (e.g., 1982, 1987, and 1992 for the three groups of application years, respectively). We maintain this restriction to be able to impose similar criteria for non-applicants in a regression analysis (preliminary results are discussed in von Wachter, Song, and Manchester 2007a). This implies the actual age at application lies above the stated age-ranges. Replicating the figures with age at application gives very similar results.

[18] More variability in earnings 8 to 5 years prior to application is to be expected, since for these years we have fewer observations.

Another important result of Figure 3 is the dynamic pattern before and after application. Employment and earnings of rejected applicants are lower than that of new beneficiaries prior to application; these workers seem to be less successful in the labor market to begin with. This impression is strengthened when we consider the evolution of earnings and employment before application. Rejected applicants experience particular declines in earnings and employment around the year of application. However, the gap between new beneficiaries and rejected applicants begins to widen three to four years prior to application in what appears to be a significant pre-application dip in labor market success. Almost two thirds of the decline in earnings appears to be completed prior to application. Employment and earnings for new beneficiaries falls very steeply around application (though some early trend in earnings is apparent for new beneficiaries as well).[19]

The differences in pre-application employment and earnings observed in Figures 1 and 3 raise the question of whether we are comparing apples and oranges. Rejected applicants may face very different labor market prospects than new beneficiaries prior to application; in this case, their employment experience after application may be less relevant as a counterfactual for potential employment patterns of new beneficiaries. One way to address the question to what extent the patterns in Table 1 and Figure 3 are driven by pre-application differences is to compare rejected applicants and new beneficiaries with similar employment histories. Within a more narrow group, rejected applicants are more likely to yield a relevant counterfactual or upper bound for the behavior of new beneficiaries.

Figure 4 shows the evolution of employment and earnings for allowed and rejected DI applicants who were employed at the same employer in the four years prior to the respective base

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[19] A small part of the pattern in Figure 3 can be attributable to aging and an overall economic trend. We will control for age and year effects in revision of this paper (for preliminary results see von Wachter, Song, and Manchester 2007a). There, we also discuss statistical significance of the displayed dynamic pattern.

period (e.g., for 1982, we required stable employment from 1978 to 1981, etc.).[20] For these workers,

initial employment rates are close to 100% by construction. Yet, even among this stable group of

workers, rejected applicants experience a stronger dip in employment prior to application than new

beneficiaries (Panel A). Similarly, employment rates post-application are again quite low. Annual

earnings prior to application are now similar (Panel B). Both groups experience a small pre-

application decline in earnings; however, post-application earnings of rejected applicants are as low

as for the full sample (Figure 3). As a result, rejected applicants with stable prior employment

experience much larger losses in earnings; we will return to this point when we analyze high-wage or

manufacturing workers in Section 4.

Overall, we believe it is fair to summarize our results for older male applicants to DI as

follows:

(1) rejected applicants do work, but little and at low earnings;

(2) these patterns have been stable for applicants in years 1982 to 1997;

(3) there is a pre-application dip in employment for rejected applicants, and a smaller pre-
application decline for earnings;

(4) the patterns we find do not appear to be driven by heterogeneity among allowed and
rejected applicants, but hold within more narrow groups of workers.

The evidence presented here is supportive of Bound's (1989) original assessment of the

work behavior of rejected DI applicants. If we follow Bound's claim that employment of rejected

applicants represents an upper bound for that of new beneficiaries, it appears unlikely that a majority

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[20] The MEF contains the Employer Identification Number (EIN) for each earnings amount recorded on the workers'
W-2. We chose the EIN from which a worker had the most earnings in any given year as the main EIN, and
classified workers as 'stable' if this EIN did not change in the four years prior to the relevant base period. Some
slippage arises for workers temporarily switching employers or for multiple job holders, but correcting for such
patterns affects job mobility rates only marginally (Von Wachter, Song, and Manchester 2007b). Appendix Figure 2
shows the fraction of so-defined 'stable' workers among all denied and allowed DI applicants over time for our three
baseline periods. As expected, new beneficiaries are more likely to have been employed at the same firm prior to the
base period. There is no strong time trend apparent from the figure, though a slight age-gradient is apparent.

of older male beneficiaries – the traditional target group for DI –would work in the absence of DI. However, our results also suggest that rejected applicants are worse off economically to begin with, and particularly so in the period immediately prior to application. With respect to our initial questions, it appears that a) it is unlikely that DI strongly reduces labor force participation among older men; and b), it is likely that DI attracts applications from workers in difficult economic times, thereby distorting incentives. The evidence presented here suggests that a substantial fraction may be screened out at application.

However, any assessment of DI based on older men must remain partial because of an increasing fraction of younger and female applicants. Even within the group of older workers, we are comparing individuals with very different impairments and labor force histories, raising the question of whether a statement based on the average rejected applicant is meaningful. We turn to these questions in Sections 3 and 4.

3.   The Employment Behavior of Rejected Younger and Female DI Applicants

Applicants and beneficiaries have become progressively younger over time; from Table 1, the share of men ages 30-44 among men above 30 doubled from 1982 to 1992, and has increased further since then (Appendix Figure 2). Particularly relevant for our purposes, a non-negligible and increasing share of rejected applicants tends to be younger – whereas men ages 30-44 constituted about 45% of rejected applicants in 1982, they were about 55% in 1992. Thus, especially when studying employment of rejected applicants, one has to include younger workers.

Table 2 replicates Table 1 for men age 30-44; the lower panels of Figure 3 show the dynamic pattern of employment and earnings.[21] The numbers in the table and figure imply the following findings; (1) the employment rate of rejected applicants after application is 50-60%, down from 70-

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[21] The choice of age 30 as a cut-off was mainly to ensure that we have a significant number of pre-application years to measure employment and to ensure that the majority of workers is covered by DI.

80% prior to application; (2) pre-application earnings of rejected applicants are lower than that of new beneficiaries, especially since the mid-1980s; (3) compared to pre-application earnings, average earnings after application and rejection decline; however, they remain considerably higher than that of older rejected applicants; (4) there is a clear widening of the gap between allowed and rejected applicants in pre-application employment (and somewhat for earnings); (5) these patterns are very stable over time, again with the exception of a drop in average earnings of rejected applicants in the mid-1980s (see also Figure 2, Panel B).

Since the comparison among all younger allowed and rejected applicants to DI may be difficult due to differential pre-earnings trends, we again replicated the pattern for workers with strong labor force attachment prior to application (Figure 4). While employment post-application for rejected applicants remains higher than for the full sample (70-80%), the decline in earnings is now larger.[22] While there is an apparent rebound in earnings in the years after application, it is partly due to a positive age-gradient common to all workers. The evolution of employment and earnings prior to application is now more similar, with less of a pre-application gap between groups. Again, with the noted exception the pattern are very stable over time.

Overall, we reach a different conclusion for young rejected DI applicants than we had for older men; their labor force attachment after application remains substantial despite significant losses in employment. Given that the age of applicants has continued to decline, this result will be important when assessing the potential work behavior of new beneficiaries and rejected applicants. The apparent stability in the pattern we find despite large changes in the number of young applicants and in the DI system suggests that current employment levels are a good guide for the future behavior of younger applicants.

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[22] If we only consider the median of positive earnings, workers in the full sample experience a full recovery, whereas those in the 'stable' sample suffer a loss of about 25-30% (see Appendix figure 4). However, this does not take into account counterfactual increases in earnings due to a common positive age-gradient.

The fraction of female applicants in our sample has increased steadily from 35% in the late 1970s to about 50% in the late 1990s (Appendix Figure 2). This increase mirrors a continuing increase in female labor force participation, leading to wider DI coverage among women. Female applicants may differ from men in a variety of ways, including their labor force history prior to application and the options they face in the labor market after an unsuccessful application to DI. Table 3 and 4 and Figure 5 replicate our analysis for older and younger women.

The analysis of women further helps to draw a consistent pattern of employment and earnings of allowed and rejected DI applicants during the period under study. Our results are best summarized considering Figure 5. First, rejected female applicants age 45-64 have low post-application employment and earnings (Panels A and B). Second, for older applicants there is a widening gap in employment and earnings between new beneficiaries and rejected applicants prior to application. Third, female applicants age 30-44 maintain a substantial amount of employment after rejection, albeit at reduced earnings. Though earnings are low, they are non-negligible, especially for those with positive earnings. Fourth, the patterns just described are very stable over time. It is worth noting that in contrast to men, rejected female applicants have not experienced a decline in earnings in the early to mid 1980s.[23]

Overall, our analysis confirms results in Bound (1989) regarding a limited labor force attachment for older DI applicants. However, a considerable fraction of younger male and female applicants continue to work. We also find that rejected applicants have lower pre-application employment and earnings, especially in the years prior to application. It appears that economically less successful male and female workers are drawn to DI.

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[23] This pattern, shown in Appendix Figure 3 (Panels C and D), is perhaps not surprising given increasing participation of women during this period (automatically increasing average earnings in the years prior to application). An increase in the gap between rejected female applicants and new beneficiaries starts to appear in the 1990s.

4. Employment and Earnings of Rejected DI Applicants by Earnings Class, Industry, and Impairment Group

Tables 1-4 reveal considerable heterogeneity among DI applicants. If this translates into different earnings after application, rejected applicants as a group may not yield a meaningful counterfactual for employment behavior. Similarly, it would be helpful to know whether there are exceptions to the general employment and earnings pattern we just described, or whether they are dominated by any particular sub-group of applicants. For this purpose, we exploited the sample size of our administrative data and replicated our analysis for several relevant sub-groups.[24]

The first sub-groups we considered were workers whose average annual earnings in the four year prior to the relevant baseline (1982, 1987, or 1992) were above or below the median. This is interesting because low-wage workers face higher replacement rates from DI, and lack of labor market opportunities is itself a criterion in the adjudication of DI claims. Figure 7 and Table 5 show earnings and employment before and after application for males; for ease of exposition, we take averages over application years spanning 1982 to 1997.[25] Considering Figure 7, we find that among rejected applicants, low-earners experience a larger pre-application decline in employment and earnings, especially for older men. On the other hand, rejected high-earners lose part of their earnings-premium vis-à-vis low-earners (all of it for older men). These patterns confirm that low-earning applicants may be driven to DI because of their economic situation. We also find that for both groups, labor force attachment of rejected applicants is quite low for older men, and reduced but non-negligible for younger men. This confirms that the patterns found in the main section are not driven by applicants coming from a particular range of the income distribution.

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[24] For the sake of brevity we limit our discussion to men. The patterns for women are summarized in Table 6.
[25] We take the average over application years 1982-1997, weighted by the group size. We have analyzed our three groups of application years separately as well, finding again that the pattern is stable over time. The only exception is an increase of employment and earnings for both groups in 1992-97.

Figure 8 shows the evolution employment and earnings for male applicants whose main employment prior to application to DI was in manufacturing or services.[26] The comparison is relevant because manufacturing is a traditionally high-wage sector with declining employment and used to be a employer of middle- and lower-skilled older men. Employment in the service sector has been growing, partly absorbing low-skill employment at lower wages. Despite these differences, the patterns are surprisingly similar between these sectors, and similar to what we found in the main analysis. Employment before and after application is largely the same; it falls more strongly prior to application for rejected applicants, and is low for older and non-negligible for younger rejected applicants after application. As expected, earnings levels prior to application are higher for both allowed and rejected applicants coming from manufacturing; again, this results in considerably larger earnings losses for high-wage applicants after an unsuccessful application. The overall picture is one of similarity between applicants from the two main industry groups, independently of whether we consider older or younger applicants.[27]

Perhaps the most interesting comparison is between applicants in different impairment groups; the current sample includes applicants whose different impairments suggest very different potential labor force attachment. For example, average health and ability to work may differ significantly between rejected applicants whose primary impairment was mental health or circulatory conditions. Similarly, adjudication of the severity of disability and a worker's potential gainful activity is much clearer in some groups (e.g., neoplasms) than in others (e.g., musculoskeletal conditions). This is reflected in the rejection rate and the rate at which rejected workers appeal, and is likely to

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[26] The classification we use is 1-digit 1980 Standard Industry Code (SIC). We analyzed the industry distribution among allowed and denied applicants and its evolution over time, and did not find noticeable differences or changes at the 1-digit level.

[27] We have analyzed changes over time as well without finding noticeable differences. This of course does not imply there may be important developments in more narrowly defined industries during particular time periods (e.g., Black, Daniel, and Sanders 2002).

have an impact on the average type of rejected claimants. How these different factors influence labor force attachment is hard to predict ex-ante.[28]

Figures 9 and 10 display the development of earnings and employment for male applicants in the most relevant impairment classes; Table 5 presents corresponding summary statistics. Figure 9 shows patterns for applicants with mental health and musculoskeletal conditions, the two most common impairments for all age-groups. Figure 10 shows the most common age-specific impairments – neoplasms and circulatory system for older applicants, injuries and circulatory system conditions for younger applicants.

To summarize, all the main patterns we have found so far are replicated within impairment classes. Especially among older applicants, the behavior of both allowed and rejected applicants between impairment codes is surprisingly similar, with at best nuanced differences. For younger applicants, we see some differences in overall earnings levels as might be expected; for example, rejected applicants with mental health conditions have lower average employment and earnings before and after application than applicants with musculoskeletal conditions (Figure 9, Panel D). Similarly, rejected workers applying to DI because of an injury fare better after application than, say, workers applying because of conditions affecting the circulatory system.

One of the factors behind reductions in employment after an unsuccessful application to DI may be the health status of rejected applicants. On average rejected applicants have substantially lower mortality rates after application than new beneficiaries, but higher mortality rates than non-applicants (Figure 6). However, this difference is unlikely to be large enough to explain employment gaps between rejected applicants and the overall population. Table 7 shows that there are some important differences in mortality by impairment class. On average, impairment groups with lower

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[28] On the one hand, those applicants rejected in an easy-to-screen impairment class such as neoplasms should be of better health than workers in hard-to-screen impairments (where the probability of mistake is higher); on the other hand, workers in the latter group might be more healthy to begin with, and the uncertainty in the screening process might further attract applications from healthier individuals.

mortality tend to have somewhat higher employment rates. However, the magnitude of the employment decline appears too large and too uniform across impairment groups to be explained by differential declines in health status. Instead, it is likely that once applicants have left the labor force and satisfied the work requirement of a DI application, an important fraction never returns to work.

5. Sensitivity Analysis – The Role of Age- and Year-Trends By Group

To fully assess the decline in employment and earnings rejected applicants experience after application, we need to take into account the *expected* evolution of their employment and earnings had they not exited the labor market and applied to the Disability Insurance program. In the absence of a group of individuals who exactly match the observed and unobserved characteristics of rejected applicants, in the following we use our administrative data to provide an approximate control group. Specifically, we compare the evolution of employment and earnings for rejected applicants to the career outcomes of a random sample of individuals not applying to SSDI who had similar prior average annual earnings, were of similar age, and worked in the same industry. This approach also allows us to control explicitly for the pre-application differences in average earnings, age, or industry between rejected and allowed applicants themselves.

To implement the comparison, we estimated a series of regression models similar to the dynamic difference-in-difference regressions estimated by Jacobson, Lalonde, and Sullivan (1993) for the event of job loss and by Krueger and Kruse (1995) for the event of spinal chord injury. Let y_{it} stand for either annual employment (a dummy for positive earnings in a given year) or annual earnings (in \$1000 deflated by the CPI at 2000 prices). Then we estimate the following distributed lag model

$$y_{it} = \alpha + \theta_t + \gamma X_{it} + \delta ALD_i + \beta DEN_i + \sum_{k \geq -8}^{\leq 10} \delta^k D_{it}^k ALD_i + \sum_{k \geq -8}^{\leq 10} \beta^k D_{it}^k DEN_i + u_{it} \qquad (1)$$

where i indexes individuals and t indexes calendar years; X_{it} captures individual characteristics; the dummies D_{it}^k indicate the k-th year before or after application to disability; and ALD_i and DEN_i are dummies for whether an individual i is an allowed or rejected disability applicant.[29] The parameter δ^k (β^k) measures the *change* in employment or earnings of allowed (rejected) applicants in the k-th year before and after application to DI relative to the baseline and *relative* to the change over time for non-applicants (captured by unrestricted year dummies θ_t). In addition, all of our models include a fourth order polynomial in both current age and average annual earnings during the baseline period. The models were estimated separately by gender and by broad age groups.

To address the concern that remaining heterogeneity among rejected applicants, new beneficiaries, and non-applicants may affect our comparison, we extended our base model in several ways. First, we included effects for two digit industry of the baseline job, effects for the employer of the baseline job, and effects for earnings class to make sure that the comparison is not affected by differences in economic background of allowed and rejected workers. Second, we replaced the single time trend by interactions of year-dummies with two digit baseline industry, earnings class, and earnings class-industry groups. This ensures that the comparison of the *evolution* of earnings and employment of allowed and rejected workers is made with workers in similar industry or earnings cells.

The estimates of δ^k and β^k for this final specification for older and younger men are shown in Figure 11.[30] The figures suggests that controlling for pre-application differences in earnings and age, and to a certain extent industry, sharpens our results in Sections 2 and 3 based on a simple comparison of averages. In particular, the regression results confirm that, with the exception of

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[29] The model is estimated using only finally rejected applicants, initially allowed applicants, and non-applicants. Including those applicants that were initially rejected and finally were awarded benefits did not substantially alter the results. This latter group is discussed in the next section.

[30] The results for older and younger women, shown in Figure 12, contain the same messages.

changes in pre-application earnings, the evolution of employment and earnings before and after application has been stable over time. The regression results also help to draw out more clearly the pre-application declines in employment and earnings for older rejected disability applicants.

Second, introducing a comparison group of non-applicants leads to the impression of a recovery in employment and earnings for older disability applicants. To explore what lies behind these patterns, Appendix Figure 7A displays annual employment rates and average earnings for non-applicants, rejected applicants, and initially allowed beneficiaries. The apparent recovery in Figure 11 can be attributed to a negative age-gradient in employment and earnings in the overall population, and is thus to a certain degree mechanical (e.g., the line for allowed applicants would slope upwards even if their employment were always zero).

Third, introducing a control group makes a more important difference for younger disability applicants. In particular, the recovery in average annual earnings for rejected applicants after application apparent from basic averages (Figure 3 or Appendix Figure 4 for positive earnings) disappears when we control for age and year trends of similar non-applicants. Thus, compared to individuals of similar age, gender, average earnings, and industry, rejected applicants bear substantial losses in both total annual earnings (Figure 11 or 12) and positive annual earnings (Appendix Figure 8). The upward earnings trend among non-applicants that delivers this result is shown in Appendix Figure 7B.

To summarize the regression results shown in the figures and display standard errors, we follow Jacobson et al. (1993) and Krueger and Kruse (1995) and impose a parsimonious but flexible functional form on the evolution of employment and earnings before and after application. This parameterization also gives us a convenient way to assess differences in the comparison between allowed and rejected workers across groups (e.g., by industry or education), and to test for the significance of these differences.

Specifically, we split the pattern into a dip prior to application, a drop during application, and a recovery following application. Thereby, the 'dip' is captured by a variable that is a linear trend -5 to -2 years prior to application and zero elsewhere; the 'drop' is captured by a dummy that is equal to one starting two years after application and zero before; the 'recovery' is captured by a variable that is linear starting three years after application and zero elsewhere. To obtain an estimate of the difference of allowed and rejected workers with respect to non-applicants, instead of a main effect we also include a dummy for the base period. If k indexes the years before and after application, we have

$$base^k = 1 \ if \ k < -6, \quad = 0 \ else$$

$$dip^k = -(k+6) \ if \ -5 \le k \le -2, \quad = 0 \ else$$

$$drop^k = 1 \ if \ k \ge 2, \quad = 0 \ else$$

$$rec^k = k - 2 \ if \ k \ge 2, \quad = 0 \ else$$

Our basic model can then be rewritten as

$$y_{it} = \alpha + \theta_t + \gamma X_{it} + \delta^0 base_{it}^k ALD_i + \delta^1 dip_{it}^k ALD_i + \delta^1 drop_{it}^k ALD_i + \delta^1 rec_{it}^k ALD_i +$$
$$\beta^0 base_{it}^k DEN_i + \beta^1 dip_{it}^k DEN_i + \beta^1 drop_{it}^k DEN_i + \beta^1 rec_{it}^k DEN_i + u_{it}$$

(2)

where we are particularly interested in the difference in the patterns of base, dip, drop, or recovery for allowed and rejected workers, over time, and across sub-samples of the population. These are captured by the two quadruplets of parameters $\left(\delta^0, \delta^1, \delta^2, \delta^3\right)$ and $\left(\beta^0, \beta^1, \beta^2, \beta^3\right)$.

Tables 8 and 9 display the parameter estimates and corresponding standard errors for the sample of older and younger men, respectively (Appendix Tables 1 and 2 show the corresponding results for older and younger women). To help assess the impact of the regression controls, the tables also display the effects without covariates. The estimated baseline differences relative to non-applicants clearly show the need to control for pre-application differences in employment and earnings among applicant groups and non-applicants. Once this is done, overall the numbers in the

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table confirm the results obtained from Figures 11 and 12 of estimates of annual dummies before and after application. We conclude that the results from the descriptive section are robust to including a control group of non-applicants and narrowing the comparison among groups of applicants with similar pre-application earnings and industry affiliation. However, we also find that ignoring age-related trends in earnings would risk misstating some of the pattern, especially for younger workers.

Finally, we extended the model in equation (2) by interacting the base dip, drop, and recovery coefficients with dummies indicating additional worker characteristics. For simplicity, we focus on binary sample characteristics; denote these by E_{it}^j, where j indexes a characteristic. Then the model we estimate is

$$
\begin{aligned}
y_{it} = \alpha + \theta_t + \gamma X_{it} &+ \left[\phi^0 base_{it}^k + \phi^2 dip_{it}^k + \phi^3 drop_{it}^k + \phi^4 rec_{it}^k\right] ALD_i + \\
&+ \left[\psi^0 base_{it}^k + \psi^1 dip_{it}^k + \psi^2 drop_{it}^k + \psi^3 rec_{it}^k\right] DEN + \\
&+ \left[\tilde{\phi}^0 base_{it}^k + \tilde{\phi}^2 dip_{it}^k + \tilde{\phi}^3 drop_{it}^k + \tilde{\phi}^4 rec_{it}^k\right] ALD_i E_{it}^j + \\
&+ \left[\tilde{\psi}^0 base_{it}^k + \tilde{\psi}^2 dip_{it}^k + \tilde{\psi}^3 drop_{it}^k + \tilde{\psi}^4 rec_{it}^k\right] DEN_i E_{it}^j + u_{it}
\end{aligned}
\tag{3}
$$

where the interactions between the characteristics and base, dip, drop, and recovery measures capture the difference in the comparison of allowed and rejected before and after application across groups. We include interactions with a dummy for non-white, for education beyond high school, for baseline earnings greater than the median, and for baseline industry equal to manufacturing or services. We first include each additional characteristic separately, and then pool all interactions in a single model. In the following, we only present results from the pooled model.

The results for the pooled model are shown in Tables 10 and 11. Table 10 shows the results for our sample of men age 45-64 at baseline when interactions with dummies for high education (more than high school), high earnings (more than median annual earnings at baseline), and

manufacturing (work in manufacturing at baseline) are included jointly in the regressions. Table 11 shows the same results for younger men.

A few notable results stand out. First, Table 10 confirms that both allowed and rejected high-earning applicants to DI have less of a drop in employment prior to application, and smaller drops in employment at the date of the application. However, they have larger pre-declines in earnings and much larger instant drops in earnings at the actual time of application. This difference is particularly pronounced for allowed workers until 1992, when the losses of allowed and rejected high earners are similar. These patterns are stable across years and robust to the inclusion of other interactions.[31] It appears high earners are less likely to lose their job before applying to DI, but are subject to substantial earnings losses prior to and at application. Second, a similar pattern of differential losses at application holds for highly educated applicants, albeit the differences are smaller and decline over time. In the years after 1987, rejected highly educated applicants do not experience significantly larger earnings losses (but keep an employment advantage). Third, workers applying from manufacturing have much smaller and barely significant advantages in terms of employment. Only the difference for allowed workers is significant, suggesting that workers previously working in manufacturing are more likely to engage in some form of activity once receiving benefits. Last, we have also estimated regression models for workers applying to DI in 1987-1992 and 1992-1997 where we included interactions between the DIP, DROP, and REC variables and the largest impairment groups (see Appendix Tables 3 and 4). Although the results are somewhat noisy, they tend to confirm the impression from the descriptive analysis that differences between impairment groups, although present, are not large. Once we condition on differences by earnings class or sector, hardly any of the differences are statistically significant.

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[31] We have also included interactions with a service dummy or a non-white dummy. The former showed no significant difference in the effects; the latter suggests earnings losses are lower but employment losses are higher for non-whites allowed applicants relative to the main effect (there is no differences for denied non-white applicants).

6.   The Characteristics of Initially Rejected New Beneficiaries

A large and growing fraction of individuals whose applications are initially rejected during the administrative phase of the disability review process are awarded benefits during the judicial review of their cases.[32] These are workers whose disability neither corresponds exactly nor is equivalent to a list of common impairments; they are also deemed to be able to find equivalent pre-disability employment during the initial screening. It is thus natural to ask whether these beneficiaries would be more likely to work in the absence of DI. In particular, finally rejected applicants might constitute a better counterfactual for these beneficiaries, since they can be more rightly considered "on the margin" of receiving DI or not. This section briefly discusses the characteristics of these "reversed" applicants, and discusses how they can be used to construct counterfactual employment figures for disability beneficiaries.

Tables 1 through 4 show that initially rejected new beneficiaries have much lower mortality rates than immediately allowed beneficiaries. Indeed, their mortality is much closer to (and sometimes lower than) that of rejected applicants. This derives partly from the fact that a high fraction applies for DI because of conditions affecting the musculoskeletal system. In fact, the majority of new beneficiaries with musculoskeletal conditions are initially rejected (e.g., Table 1). Appendix figure 5 shows that "reversals" have somewhat lower average earnings prior to application than regular new beneficiaries, especially during the 1990s. Yet, their earnings are always higher than that of finally rejected applicants. Similarly, their employment and earnings do not dip prior to application as in the case of rejected applicants (Appendix figure 6). Initially rejected new

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[32] The fraction of initially denied new beneficiaries was 30% (40%) for 30-44 (45-54) year old men in the early 1980s, and 40% (60%) from the late 1980s onwards (Appendix figure 5). The current figures for the older age group do not include 55-64 year olds, but the pattern including older workers are very similar (the figures were being generated when the working paper went into press for the RRC conference).

beneficiaries look more like regular new beneficiaries rather than finally rejected applicants in terms of their pre-application employment dynamics.[33]

Overall, the decline in average pre-application earnings and the low post-application mortality rate suggests that some initially rejected new beneficiaries may be economically motivated. Yet, they clearly distinguish themselves from finally rejected applicants in terms of both earnings level and employment dynamics prior to application. Thus, we believe it is fair to say that while the evidence is perhaps suggestive, we cannot say we have found a smoking gun indicating that a majority of initially rejected new beneficiaries are induced to apply to DI because of economic conditions.

6.1   A Counterfactual Exercise Based on Initially Rejected New Beneficiaries and Finally Rejected Applicants

Whatever the conclusion from the foregoing analysis, the fact that their applications of initially rejected new beneficiaries were rejected in the first stages of the disability review process implies that their health status and employment potential were deemed better than that of the typical new beneficiary. This and similar mortality rates indicate that the employment behavior of finally rejected applicants may be a better counterfactual for potential employment of initially rejected new beneficiaries than for regular new beneficiaries. Yet, if we attach at least some significance to the outcome of the judicial review, we can assume that the employment potential of the majority of initially rejected new beneficiaries is lower than that of finally rejected applicants.

Based on these considerations, in the following we treat the proportion of initially rejected new beneficiaries as an estimate of the fraction of all new beneficiaries that are "on the margin" of

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[33] For two to three years after application, their employment and earnings remain higher than that of immediately allowed new beneficiaries; this is likely to be due to the fact that our way of measuring final benefit receipt (through entries in the Master Beneficiary Record), is not able to exclude applicants who work after their first application is denied and then re-apply successfully in the course of a few years.

receiving DI; it is reasonable to assume that these beneficiaries are the ones most likely to exhibit some labor force attachment in the absence of DI. To predict employment in the absence of DI, we follow Bound (1989) and use the work behavior of finally rejected applicants as an upper bound for the employment rate of this group. The counterfactual employment rate of new beneficiaries in different age or gender groups is then easily calculated as

$$\begin{aligned} &\Pr\{\text{Working} \mid \text{New Beneficiary}\} \le \\ &\Pr\{\text{Working} \mid \text{Finally Rejected}\} \times \Pr\{\text{Initially Rejected} \mid \text{New Beneficiary}\} \end{aligned}.$$

For example, according to Appendix figure 5, in the 1990s about 40% of all new beneficiaries among men age 45-54 were initially rejected. Based on this fraction and average post-application employment of rejected applicants from Figure 3, the potential employment rate for this age-group would be at most 8% (20% times 40%). For younger male applicants, the comparable fraction would be at most 21% (30% times 70%). Clearly, these numbers can be no more than approximate, not least because a proper counterfactual would take into account pre-application differences in earnings and employment. Nevertheless, this exercise gives a useful indication of the orders of magnitude involved. Overall, the predicted potential employment rates of new beneficiaries appear very low for older workers; although an order of magnitude greater, they cannot be called large for younger applicants.

An obvious drawback and limitation of this approach is that it understates employment behavior of those new beneficiaries that were immediately awarded benefits. While these applicants were either of lower health or were deemed to not be able to pursue a substantial gainful activity, some of them may nevertheless be able to work. One approach to incorporate their employment into the counterfactual just constructed is to use the actually observed employment rate of initially

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awarded new beneficiaries. This is likely constitutes a *lower* bound of these beneficiaries' work potential.

$$\Pr\{\text{Working} \mid \text{New Beneficiary}\} \leq$$
$$\Pr\{\text{Working} \mid \text{Finally Rejected}\} \times \Pr\{\text{Initially Rejected} \mid \text{New Beneficiary}\}$$
$$+ \Pr\{\text{Working} \mid \text{Initially Accepted}\} \times \Pr\{\text{Initially Accepted} \mid \text{New Beneficiary}\}$$

Again eyeballing Figure 3, we would obtain as counterfactual employment rates

Men Age 45-64: (20% * 40%) + (10% * 60%) = 8% + 6.0% = 14%

Men Age 30-44: (30% * 70%) + (20% * 30%) = 21% + 6.0% = 27%

These numbers are higher than what we had before, but still relatively low. Given our treatment of initially awarded beneficiaries, these numbers should probably be treated as lower bounds. However, they are indicative of how the approximation introduced by Bound can be affected by disaggregating the group of new beneficiaries into more specific groups about whose potential labor force status additional information is available.

There are two ways to interpret these simple counterfactuals. First, they can be viewed as counterfactual employment for new beneficiaries in the absence of the DI system altogether; this would be in the spirit of Bound's (1989) original interpretation. Such an interpretation requires that the low employment rate of rejected applicant is due to bad health or due to generally low labor market prospects, but *not* due to factors associated with the application to DI itself. A second interpretation views the counterfactual as prediction of what would happen in the case of a rejection or termination of benefits of a new beneficiary. In this case, it does not matter what affects employment of rejected applicants; in particular, the application process itself could lower their employment prospects.

In the second case, counterfactual employment rates in the absence of DI altogether would likely be higher than what is predicted above for two reasons. First, counterfactual employment rates of new beneficiaries would probably be predicted to be higher had they never gone through the DI application process; given that the predicted fraction of new beneficiaries deemed "on the margin" is below 50% (Appendix figure 5), this is unlikely to make a very big difference.[34] Second, in this scenario in the absence of DI a higher fraction of rejected applicants would work as well. How big the effect of the application process for DI itself is on labor force participation is difficult to answer without more detailed information on health or random assignment of the decision to apply for DI.

The point of this discussion is twofold. First, because we only consider initially rejected new beneficiaries as an estimate of beneficiaries "on the margin" of working, in neither scenario is a high fraction of new beneficiaries likely to work. Due to this approach the counterfactual employment rates we presented are also lower than those implied by Bound (1989). Second, a full account of the employment effects of the DI system would benefit from a closer analysis of rejected applicants. On the one hand, it is likely that the DI application process itself imposes a significant cost on rejected workers and on society in terms of lost employment and earnings. On the other hand, it implies that the employment effects of DI could be reduced by inducing rejected applicants to return to the labor force. This may yield more cost-effective ways of limiting potential adverse effects of DI on employment rates of workers who would be in the labor force were it not for a potentially unsuccessful application to DI.

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[34] E.g., numbers in Figure 3 Panel B for younger male workers show that employment in prior to DI is about 85%, implying an employment rate of 25.5% (30% times 85%) in the absence of DI, an improvement of 4.5% relative to the previous counterfactual of 21%. From Panel A, for older male workers the new counterfactual upper-bound employment rate would be 36% (40% times 80%), an bigger increase vis-à-vis the initial counterfactual; however, this number does not take into account the negative age-gradient in employment rates during that period, and is still lower than Bound's original estimates.

7. Changes in Age-Composition and Potential Employment of New Beneficiaries

Although employment of single groups of rejected applicants appears roughly stable from the early 1980s to the mid-1990s, there has been a marked change in the characteristics of applicants. Among others, applicants have become younger and more affected by impairments with lower mortality, such as musculoskeletal conditions. Some of these composition changes imply that even though within each group of new beneficiaries' predicted employment – as approximated by employment of rejected applicants – is stable, predicted employment potential of new beneficiaries as a group may have been rising over time.

To see this directly, we can aggregate the Bound counterfactual for employment for each age-group g to a counterfactual for all new beneficiaries $\widetilde{e}_t$ using the shares of each age group $s_{gt}^{\text{New Beneficiaries}}$ among all new beneficiaries as weights,

$$\widetilde{e}_t \equiv \sum_g e_{gt}^{\text{Rejected Applicant}} \times s_{gt}^{\text{New Beneficiaries}} .$$

This decomposition highlights that both changes in group-specific shares and changes in group-specific employment rates will affect the counterfactual employment rate for new beneficiaries. The decomposition also suggests that a straightforward way to assess the role of changes in the age distribution over time is to recalculate the counterfactuals holding age shares constant at the level of the initial period ($\breve{e}_t \equiv \sum_g e_{gt}^{\text{Rejected Applicant}} \times s_{g0}^{\text{New Beneficiaries}}$). The difference between the two measures $\widetilde{e}_t$ and $\breve{e}_t$ indicates the role of changes in the age-distribution to potential employment of new beneficiaries.

To implement this decomposition, we calculated the fraction of years worked in the five years after application for rejected male applicants by year of application and age-group. We

then generated $\widetilde{e}_t$ and $\breve{e}_t$ as just explained. The shares in $\breve{e}_t$ are thereby held constant at the level in 1981. Figure 13 displays the results. The first line from the top is simply the average 5-year employment rate for all rejected applicants. It is higher than the second line $\widetilde{e}_t$ (representing the sum of age-group-specific employment rates weighted by the population age-shares among new beneficiaries) since on average new beneficiaries are older than rejected applicants, and older workers are predicted to work less (e.g., see Tables 1 and 2).

The third line from the top shows the same measure when we hold age-shares constant at their 1981 level ($\breve{e}_t$). It is lower than the second line ($\widetilde{e}_t$), since the fraction of young beneficiaries has been increasing over time. Not taking into account for this increase, we would underestimate potential employment of new beneficiaries according to the Bound approximation. The difference between the second and third line shows the degree of the underestimation. The difference is substantial, indicating that not taking into account of composition changes and only focusing on developments within groups one would miss an important part of the story. Were we to ignore changes in the age composition of new beneficiaries, we would conclude that potential employment behavior was roughly stable from the early 1980s to the early 1990s, and not rising until the mid to late 1990s. However, Figure 13 shows that changes in the age-composition have led to a rising potential employment rate already starting in the mid-1980s.

8.   Conclusion

We have used administrative data comprising earnings, impairment, and mortality information for a sample of DI applicants and non-applicants covering 1978 to 2004 to replicate and extend Bound's (1989) seminal analysis of rejected DI applicants. We confirm Bound's main result that the constituency typically served by DI – men age 45-64 – does not have substantial employment after rejection. This holds independently of gender, industry, prior wage or impairment

type. It also holds for workers with very similar prior employment history, and is thus unlikely to be driven by pre-application differences in earnings and employment. We also show that these patterns are very stable over time. Thus, with respect to older male applicants, Bound's original conclusion holds; it appears unlikely that their employment rate would rise significantly in the absence of federal DI.

However, our further results suggest one has to be careful not to generalize from this group to all new DI beneficiaries. An increasing fraction of DI applicants is younger than 45 and in better health. We show that these applicants maintain substantial labor force attachment after rejection, albeit at a lower rate than before application. Thus, for younger DI beneficiaries, we cannot exclude potentially substantial labor force attachment based on rejected applicants. If rejected applicants constitute an upper bound, this bound is substantial. Yet, we have also argued that the importance of this finding depends on who among new beneficiaries is deemed as most likely to be "on the margin" between receiving and not receiving DI. In the paper, we have exploited the institutional features of the process of determination of benefit eligibility to use the fraction of new beneficiaries who were initially rejected as an estimate of such "marginal" applicants. Even though a substantial and increasing fraction of new beneficiaries had their applications rejected initially, the resulting counterfactual for labor force participation of younger new beneficiaries is again low.

We also found signs that economically less successful workers are drawn to apply to DI. A substantial fraction of these workers appear to be screened out during the application process; this results in rejected applicants having lower pre-application earnings and employment than new beneficiaries. The gap increases in the years prior to application, and is larger for older applicants. This evidence appears to confirm that DI leads low-wage workers to leave the labor force and apply to DI. Since rejected applicants bear considerable losses in employment and earnings, this process imposes substantial costs on these workers and on society as a whole in terms of lost output.

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The large losses in average employment and earning at application that we find suggest that the application to DI in itself may be costly for workers. From a labor economics perspective, the temporary but substantial departure from the labor force that an application requires could well explain part of the substantial losses we find. In this case, using employment of rejected applicants as an upper bound makes a statement about counterfactual employment of new beneficiaries *were they rejected*, not of their employment in the absence of DI altogether. This also implies that the exclusive focus on new beneficiaries when trying to understand the employment effects of DI may miss part of the story. Those more at risk of being drawn out of the labor force by DI are workers on the margin between receiving and not receiving DI; our finding suggests many of these applicants end up rejected and without a job.

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Figure 1, Panel A: Number of Applicants to DI and Number of Allowed and Rejected Men Age 45–54
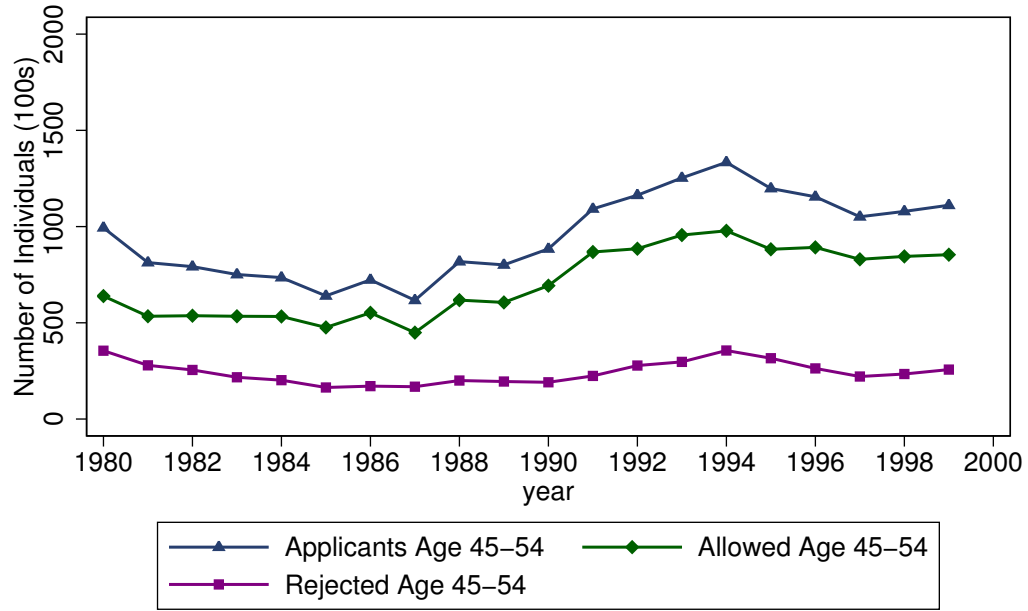
Source: 1% Files of Social Security administrative data (see text).

Figure 1, Panel B: Number of Applicants to DI and Number of Allowed and Rejected Men Age 30–44

Source: 1% Files of Social Security administrative data (see text).

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Figure 2, Panel A: Average Annual Earnings Pre–Application of All DI Applicants, Allowed, and Rejected Applicants, Men Age 45–54
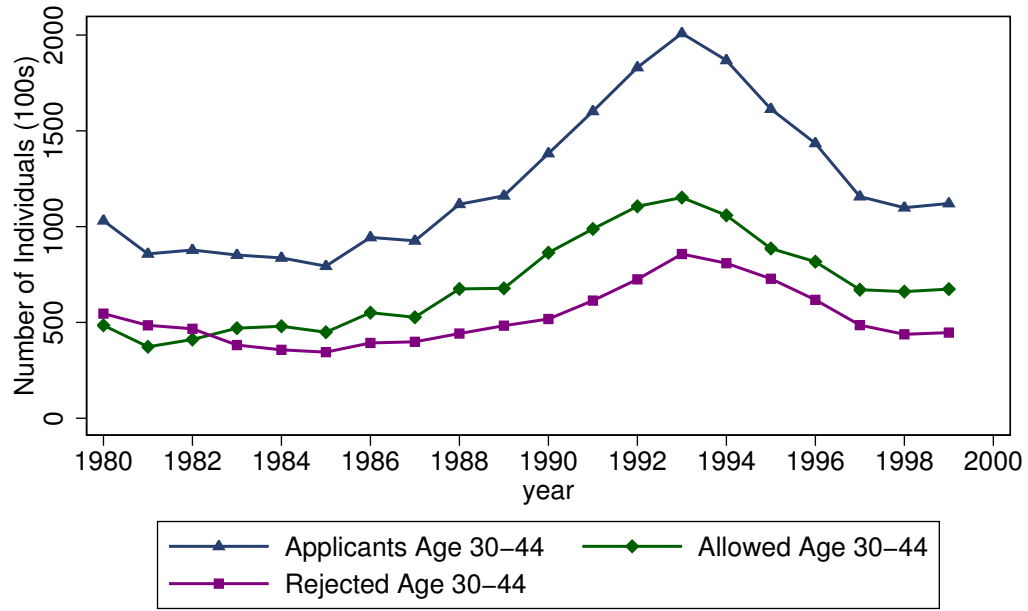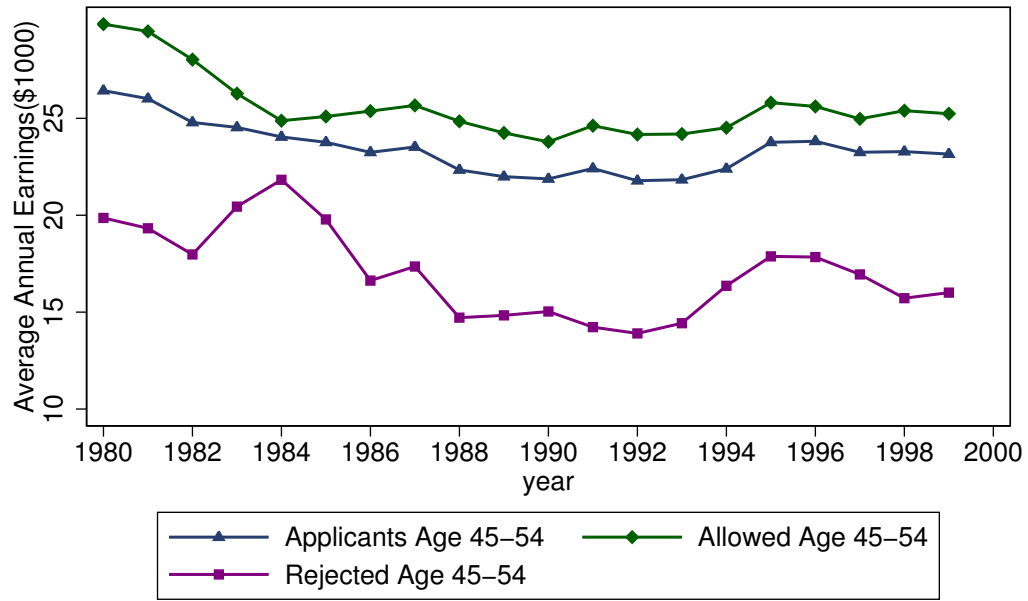
Source: 1% Files of Social Security administrative data (see text).

Figure 2, Panel B: Average Annual Earnings Pre–Application of All DI Applicants, Allowed, and Rejected Applicants, Men Age 30–44
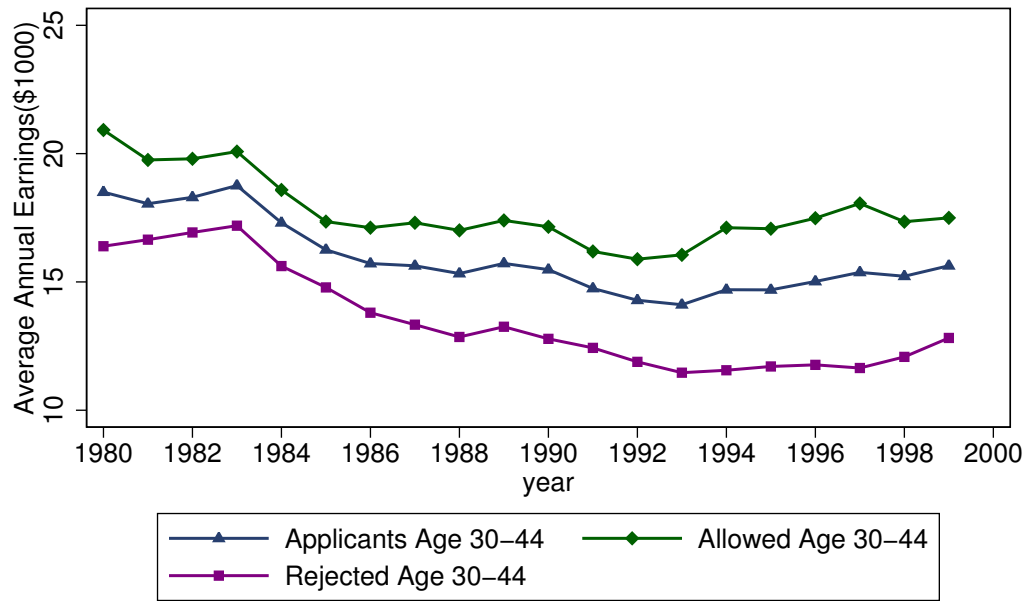
Source: 1% Files of Social Security administrative data (see text).

Figure 3: Average Annual Employment and Earnings for Allowed and Rejected Male DI Applicants Before and After Application for Disability Insurance

Panel A: Annual Fraction Employed Allowed and Rejected Applicants, Age 45–64
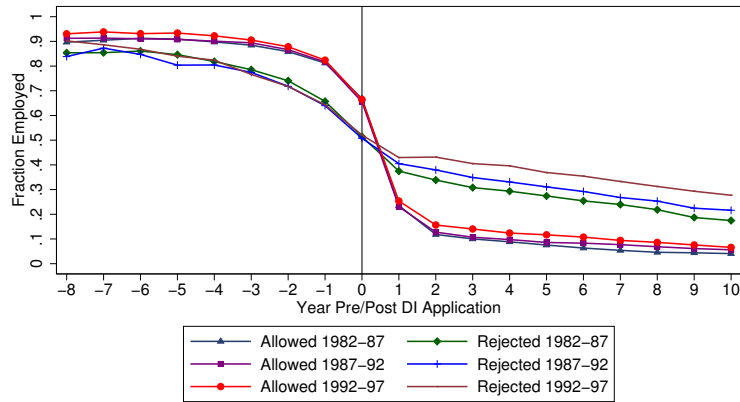
Panel B: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 45–64

Panel C: Annual Fraction Employed Allowed and Rejected Applicants, Age 30–44

Panel D: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 30–44

Source: 1% Files of Social Security administrative data (see text).

Figure 4: Average Annual Employment and Earnings for Allowed and Rejected Male DI Applicants Before and After Application for Disability Insurance Sample with Stable Employment Prior to Application

Panel A: Annual Fraction Employed Allowed and Rejected Applicants, Age 45–64

Panel B: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 45–64

Panel C: Annual Fraction Employed Allowed and Rejected Applicants, Age 30–44

Panel D: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 30–44

Source: 1% Files of Social Security administrative data (see text).

Figure 5: Average Annual Employment and Earnings for Allowed and Rejected Female DI Applicants Before and After Application for Disability Insurance

Panel A: Annual Fraction Employed Allowed and Rejected Applicants, Age 45–64

Allowed 1982–87		Rejected 1982–87
Allowed 1987–92		Rejected 1987–92
Allowed 1992–97		Rejected 1992–97

Panel B: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 45–64

Allowed 1982–87		Rejected 1982–87
Allowed 1987–92		Rejected 1987–92
Allowed 1992–97		Rejected 1992–97

Panel C: Annual Fraction Employed Allowed and Rejected Applicants, Age 30–44

Allowed 1982–87		Rejected 1982–87
Allowed 1987–92		Rejected 1987–92
Allowed 1992–97		Rejected 1992–97

Panel D: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 30–44

Allowed 1982–87		Rejected 1982–87
Allowed 1987–92		Rejected 1987–92
Allowed 1992–97		Rejected 1992–97
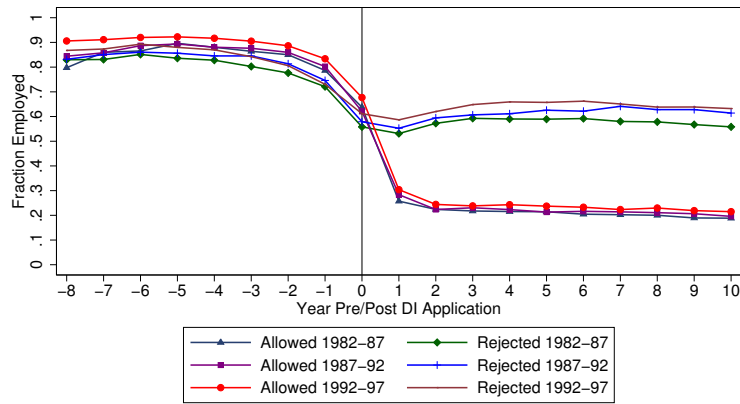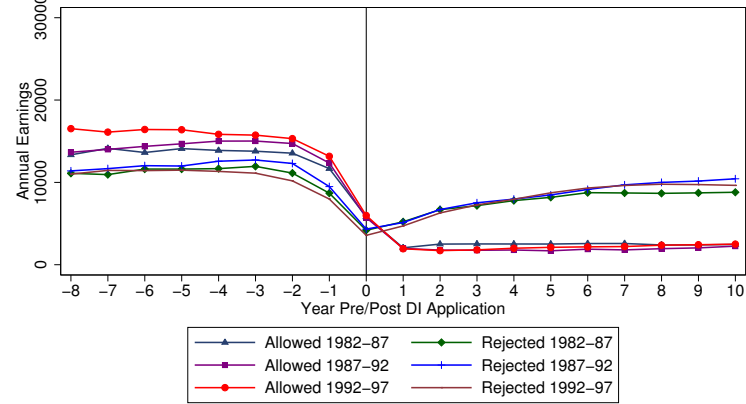
Source: 1% Files of Social Security administrative data (see text).

Figure 6: Fraction Dying After Application for Disability Insurance Allowed and Rejected First Time Disability Applicants
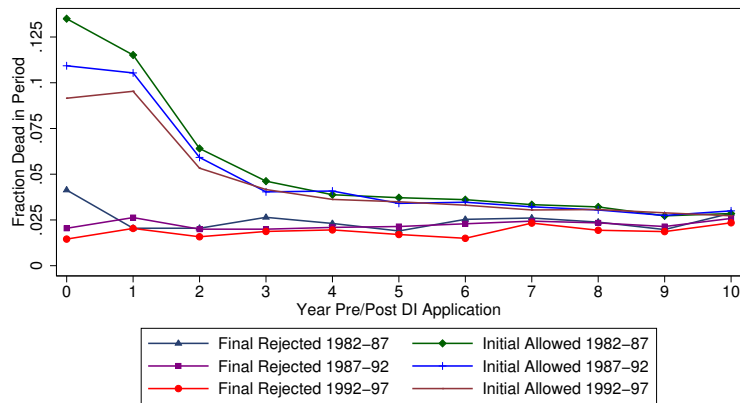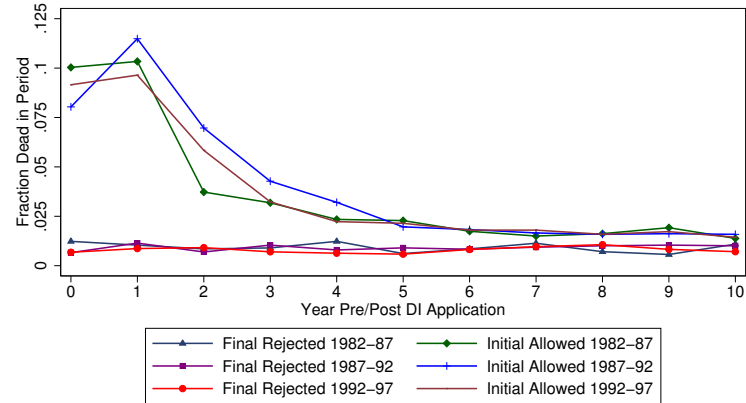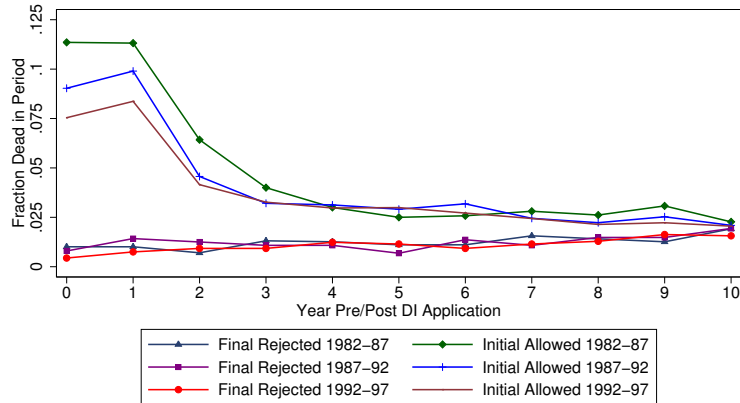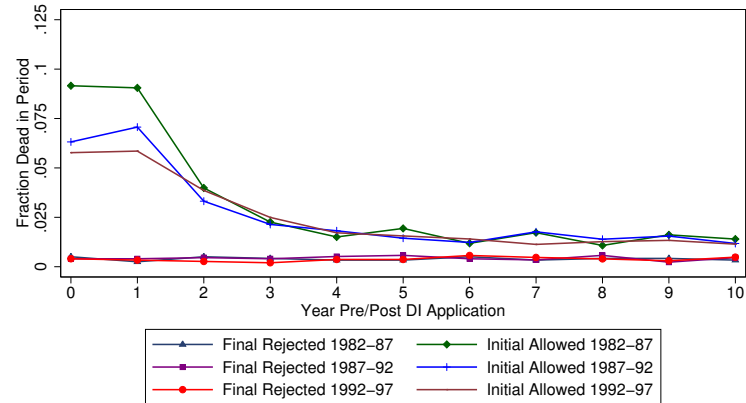
Source: 1% Files of Social Security administrative data (see text).

Figure 7: Average Annual Employment and Earnings for Allowed and Rejected Male DI Applicants Before and After Application for Disability Insurance
Low vs. High Average Annual Earnings Prior to Application

Panel A: Annual Fraction Employed Allowed and Rejected Applicants, Age 45–64
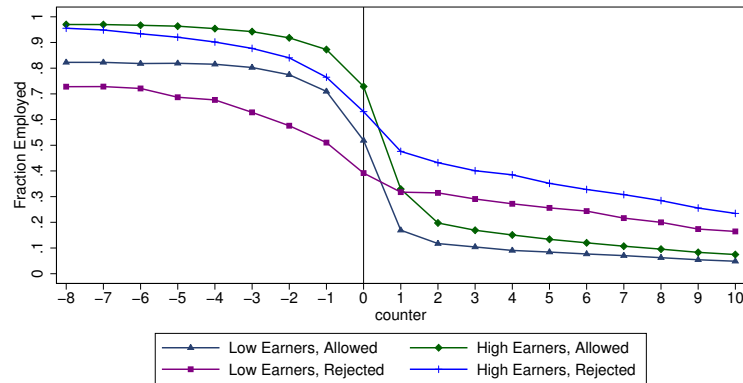
Panel B: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 45–64
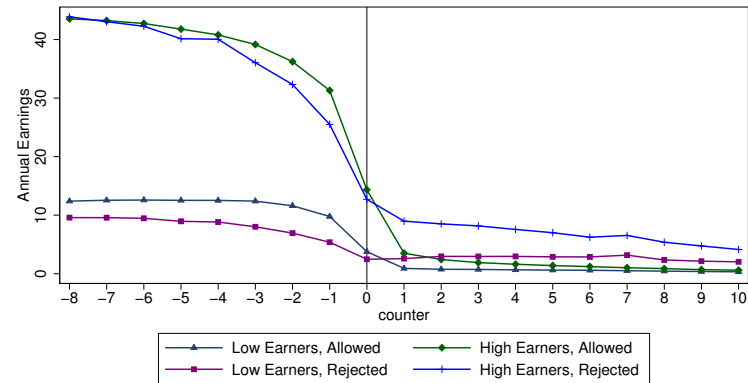
Panel C: Annual Fraction Employed Allowed and Rejected Applicants, Age 30–44
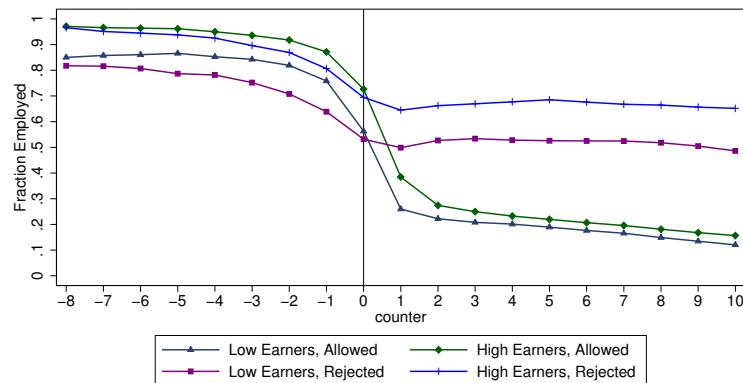
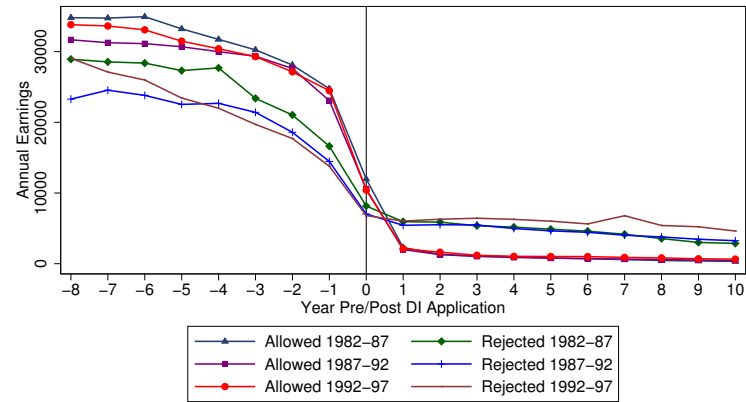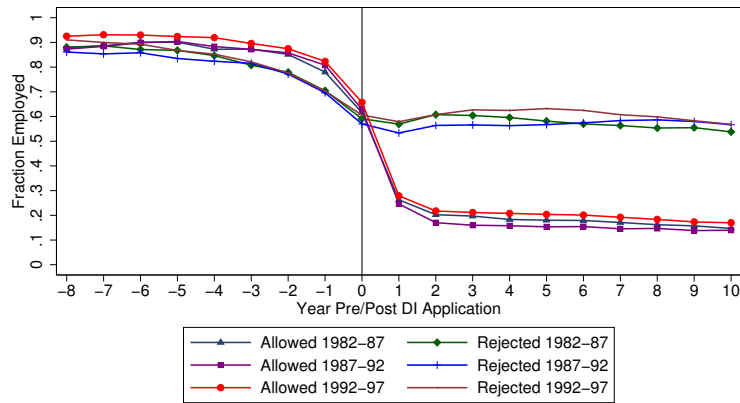Panel D: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 30–44
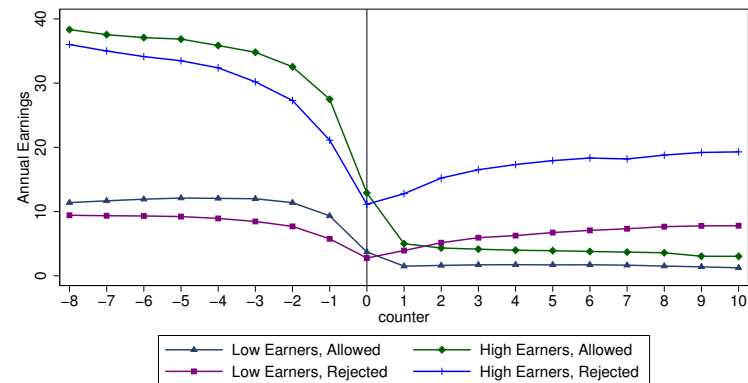
Source: 1% Files of Social Security administrative data (see text).

Figure 8: Average Annual Employment and Earnings for Allowed and Rejected
Male DI Applicants Before and After Application for Disability Insurance
Employed in Manufacturing or Services Prior to Application

Source: 1% Files of Social Security administrative data (see text).

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Figure 9: Average Annual Employment and Earnings for Allowed and Rejected Male DI Applicants Before and After Application for Disability Insurance By Broad Impairment Class of Disability

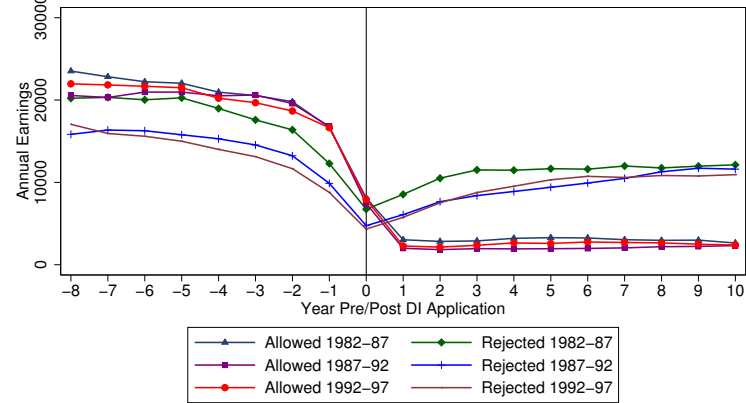Panel A: Annual Fraction Employed Allowed and Rejected Applicants, Age 45–64

Panel B: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 45–64

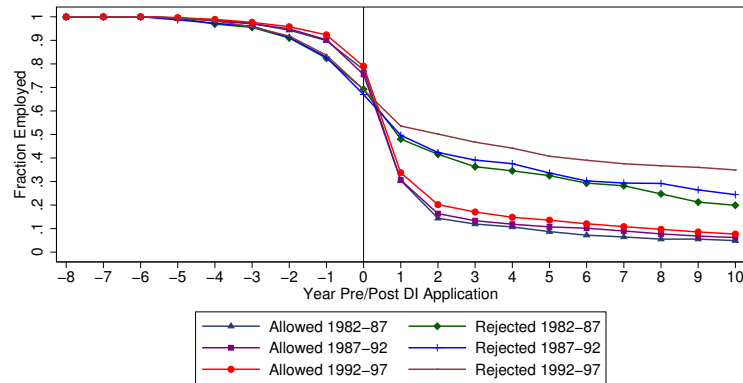Panel C: Annual Fraction Employed Allowed and Rejected Applicants, Age 30–44

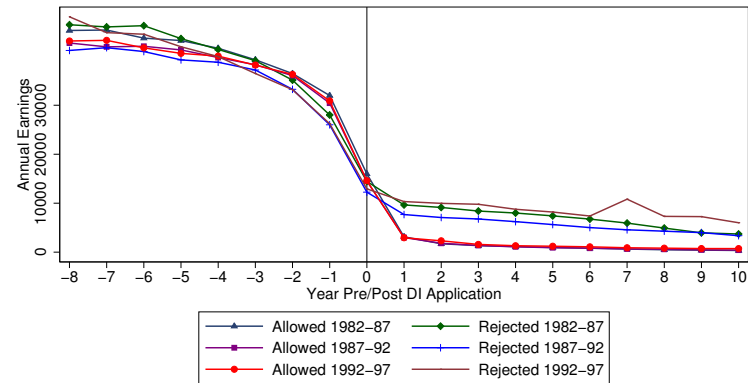Panel D: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 30–44

Legend (Panels A & C):
- Mental/Nervous, Allowed
- Mental/Nervous, Rejected
- Muscuskeletal System, Allowed
- Muscuskeletal System, Rejected
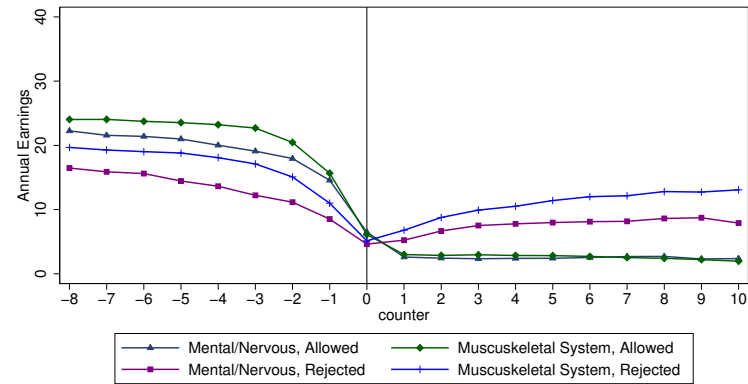
Source: 1% Files of Social Security administrative data (see text).

Figure 10: Average Annual Employment and Earnings for Allowed and Rejected
Male DI Applicants Before and After Application for Disability Insurance
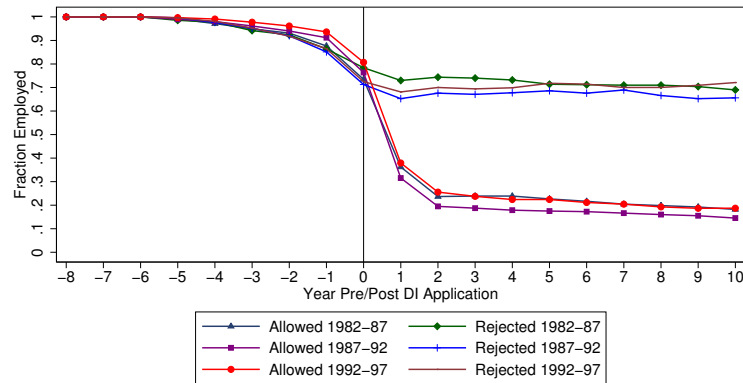By Broad Impairment Class of Disability

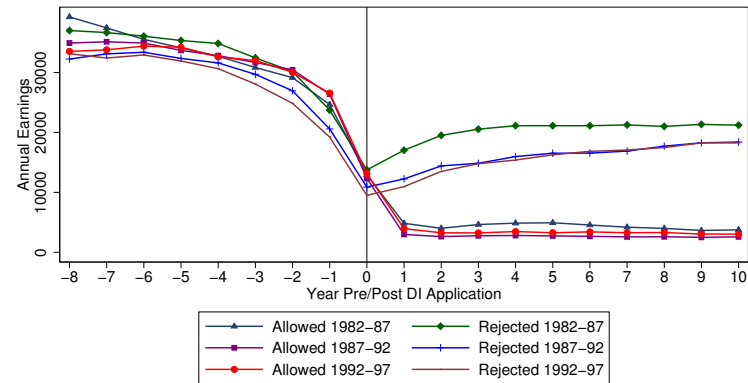Panel A: Annual Fraction Employed Allowed and Rejected Applicants, Age 45–64
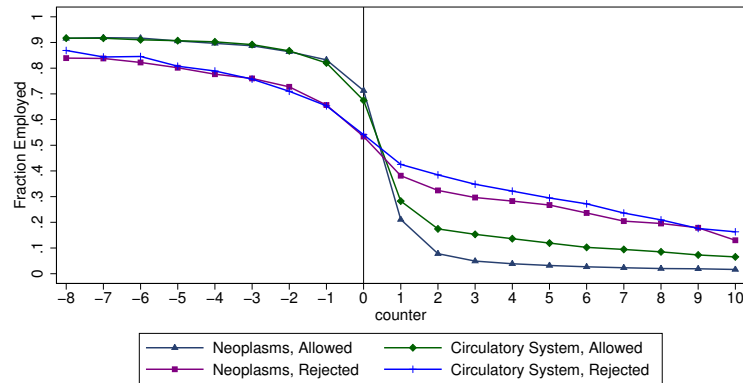
Panel B: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 45–64
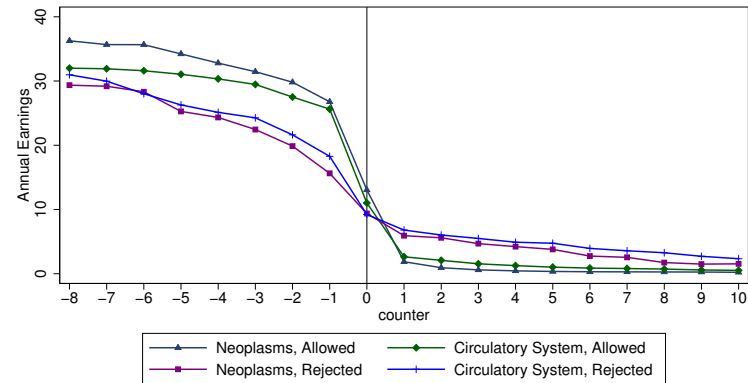
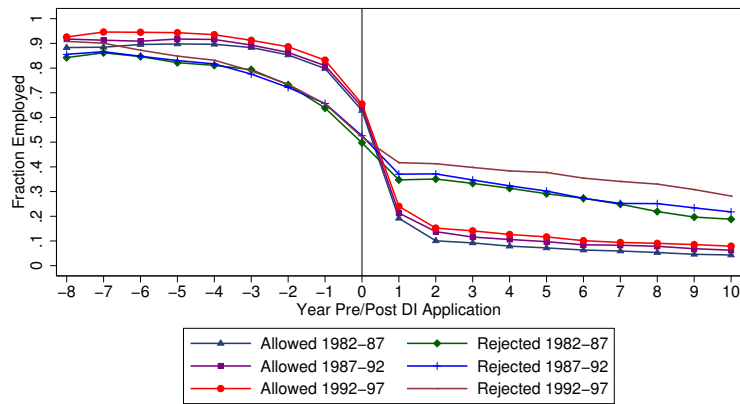Panel C: Annual Fraction Employed Allowed and Rejected Applicants, Age 30–44

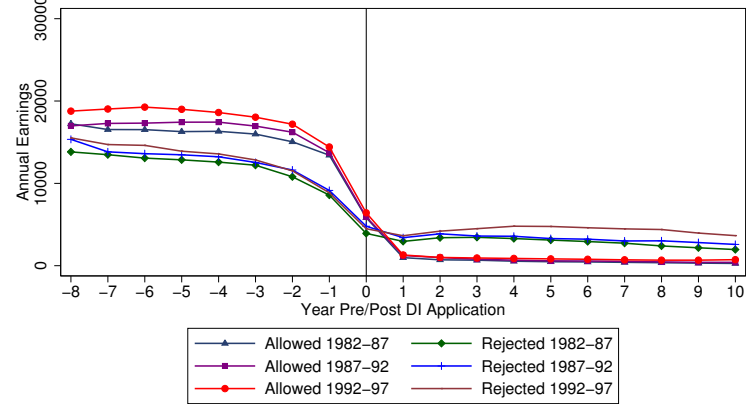Panel D: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 30–44
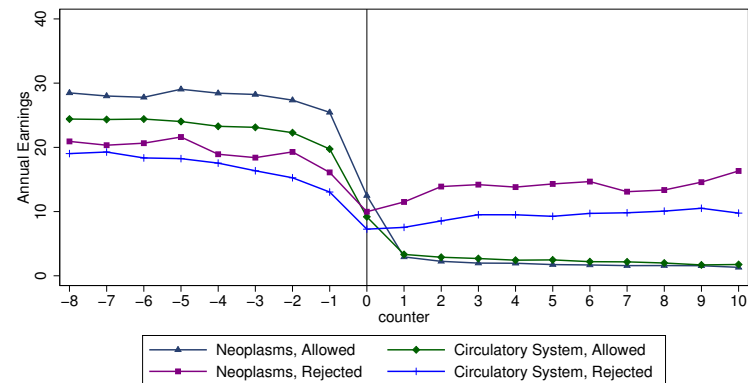
Source: 1% Files of Social Security administrative data (see text).

Figure 11: Difference in Employment and Earnings Between Allowed or Rejected and Non−Applicants Before and After DI Application, Men, Full Regression Specification

Panel A: Difference in Fraction Employed Relative to Non−Applicants, Age 45−64
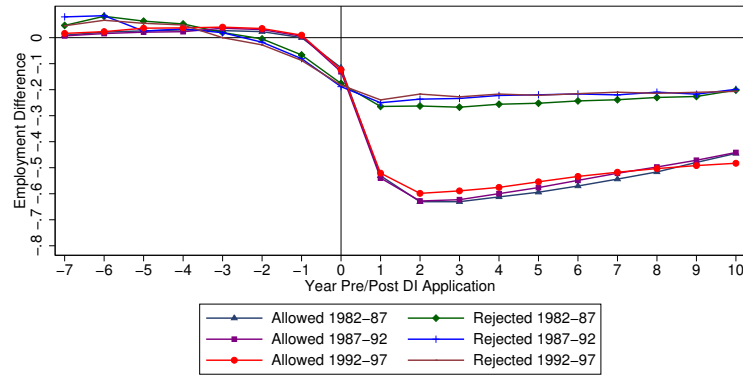
Panel B: Difference in Annual Earnings ($1000) Relative to Non−Applicants, Age 45−64

Panel C: Difference in Fraction Employed Relative to Non−Applicants, Age 30−44
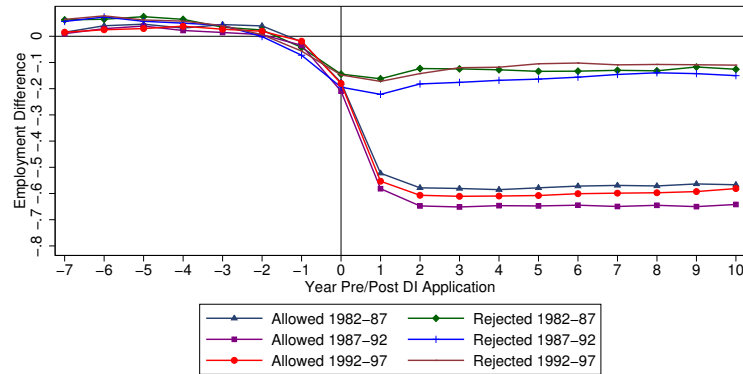
Panel D: Difference in Annual Earnings ($1000) Relative to Non−Applicants, Age 30−44
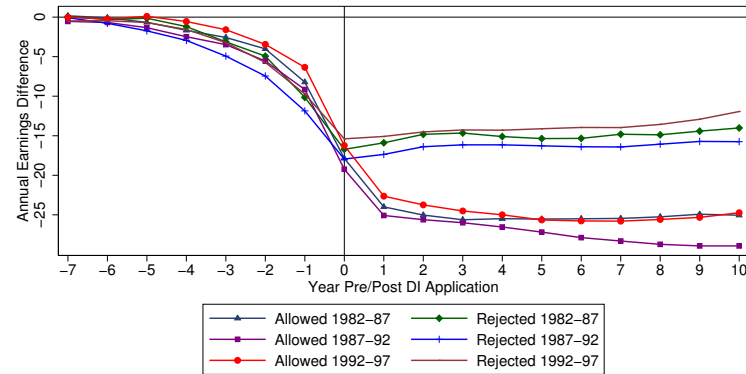
Source: 1% Files of Social Security administrative data (see text). Regression specification includes a quartic in age, a quartic in baseline average annual earnings, and year dummies interacted with ten dummies for earnings class prior to application and twelve industry dummies (see text for details).

Figure 12: Difference in Employment and Earnings Between Allowed or Rejected and Non−Applicants Before and After DI Application, Women, Full Regression Specification

Panel A: Difference in Fraction Employed Relative to Non−Applicants, Age 45−64

Panel B: Difference in Annual Earnings ($1000) Relative to Non−Applicants, Age 45−64

Allowed 1982−87	Rejected 1982−87
Allowed 1987−92	Rejected 1987−92
Allowed 1992−97	Rejected 1992−97

Panel C: Difference in Fraction Employed Relative to Non−Applicants, Age 30−44

Panel D: Difference in Annual Earnings ($1000) Relative to Non−Applicants, Age 30−44

Allowed 1982−87	Rejected 1982−87
Allowed 1987−92	Rejected 1987−92
Allowed 1992−97	Rejected 1992−97

Source: 1% Files of Social Security administrative data (see text). Regression specification includes a quartic in age, a quartic in baseline average annual earnings, and year dummies interacted with ten dummies for earnings class prior to application and twelve industry dummies (see text for details).

Figure 13: Employment of New Male DI Beneficiaries Predicted by Employment of Rejected Applicants, Age Shares of Rejected Applicants ('Original') or Age Shares of New Beneficiaries (Current or Constant at 1981 Value)
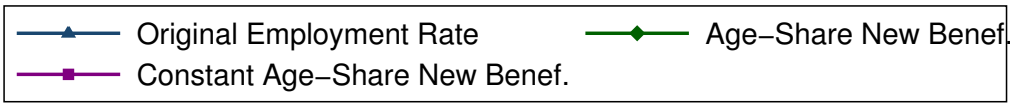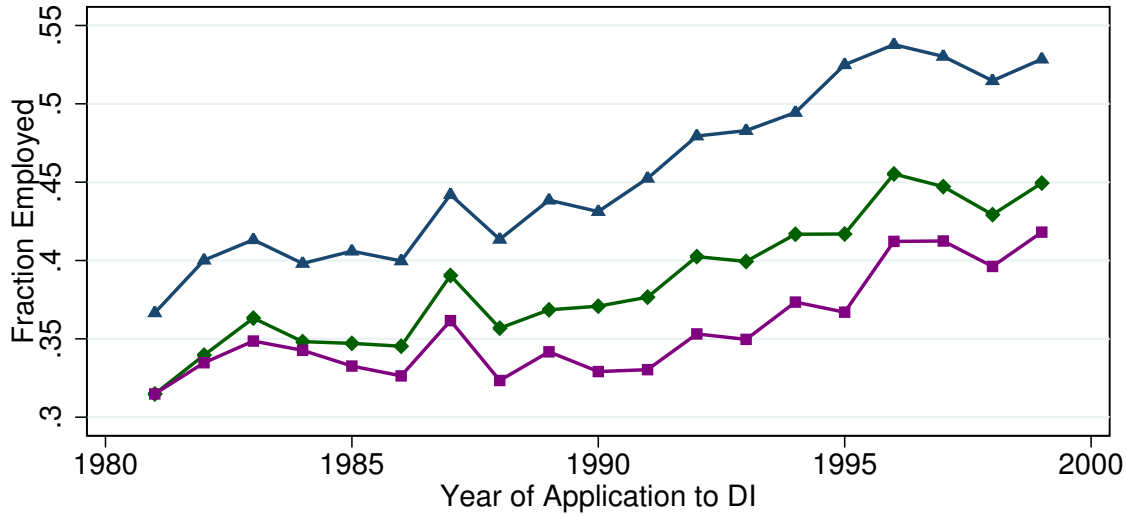
Appendix Figure 1: Total Number of Applicants, New Beneficiaries and Rejected
Our Samples, All Applicants (SSA), and Samples of Initial Applicants (831 File)

Panel A: Total Number of Applicants
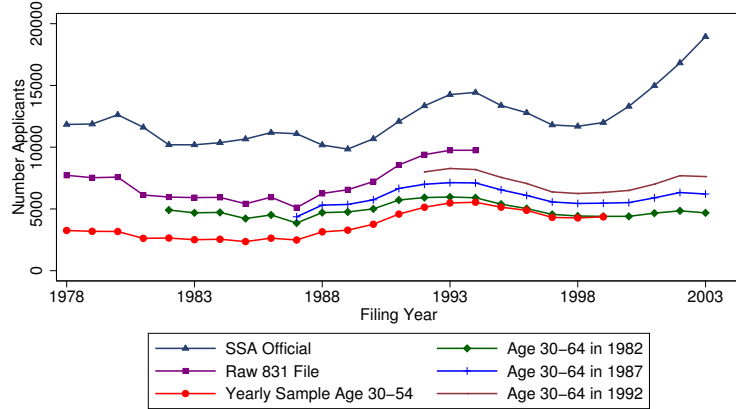
Panel B: Total Number of New Beneficiaries (Allowed)
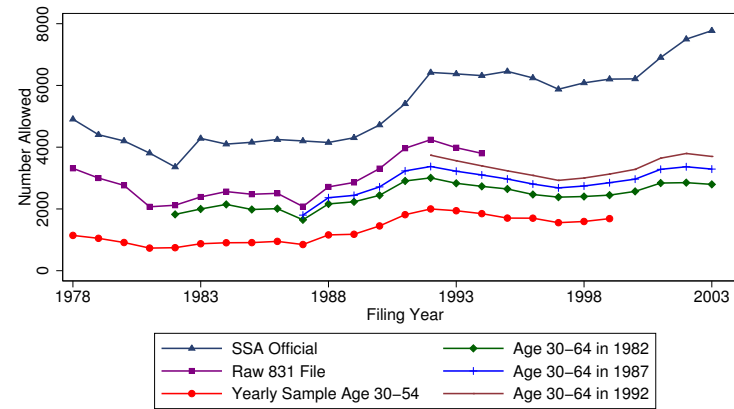
Panel C: Total Number of Rejected Applicants
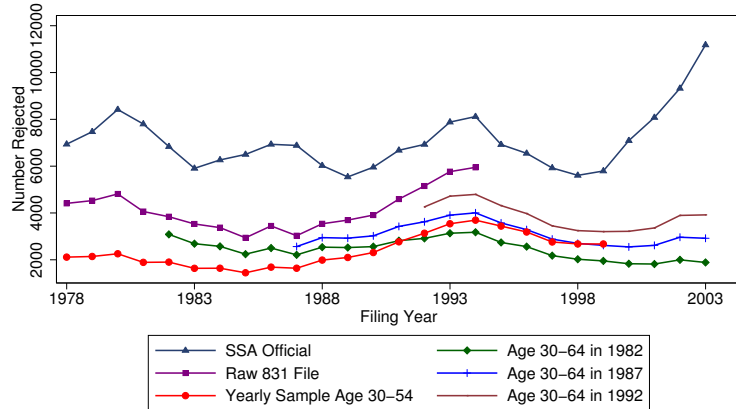
Source: 1% Files of Social Security administrative data (see text). Numbers from 831 File only refer to initial applicants.

Appendix Figure 2: Average Characteristics of Allowed and Rejected Applicants By Application Year, Cohorts Age 30–64 in 1982, 1987, and 1992
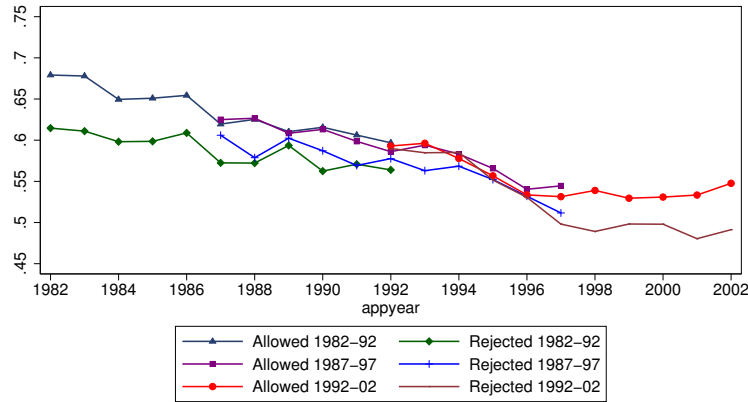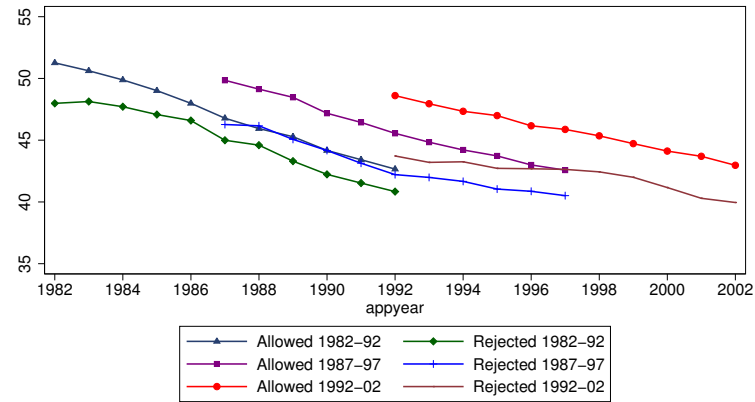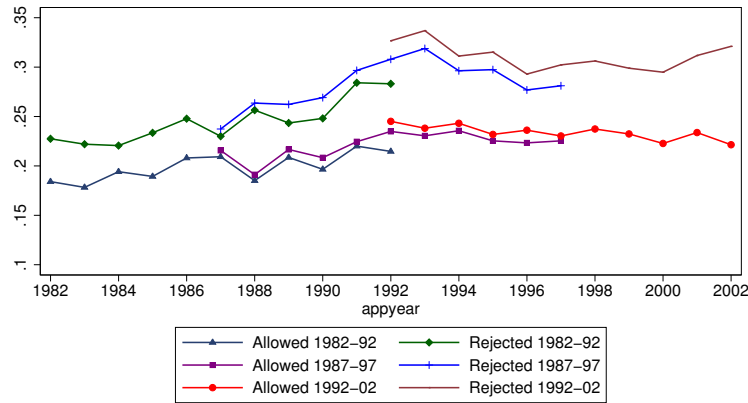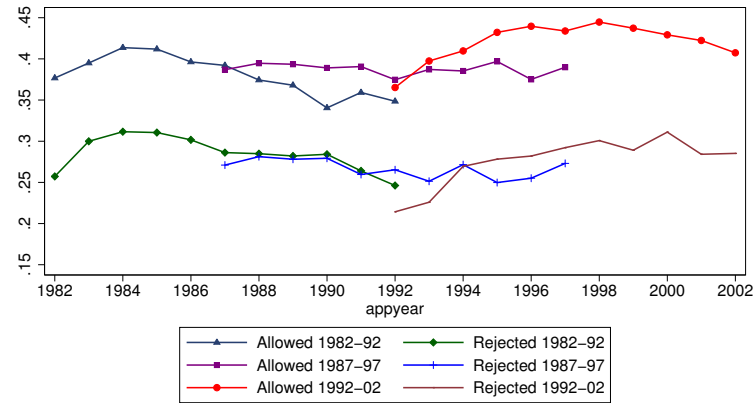
Source: 1% Files of Social Security administrative data (see text).

Appendix Figure 3: Number of Applicants and Average Annual Earnings Before Application Female DI Applicants, New Beneficiaries and Finally Rejected Applicants

Panel A: Number of Applicants to DI and Number of Allowed and Rejected
WoWomen Age 45–54
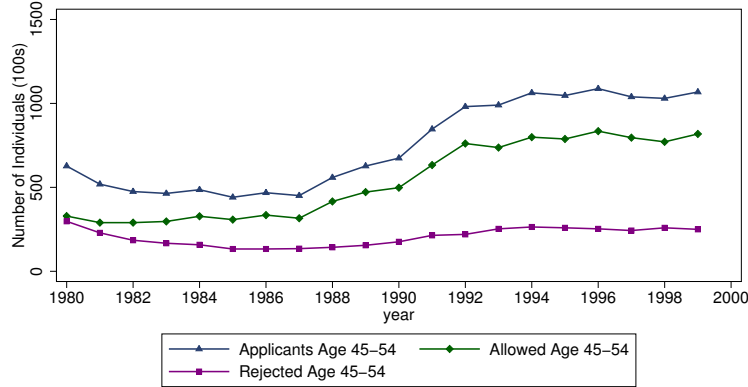
Panel B: Number of Applicants to DI and Number of Allowed and Rejected
Women Age 30–44
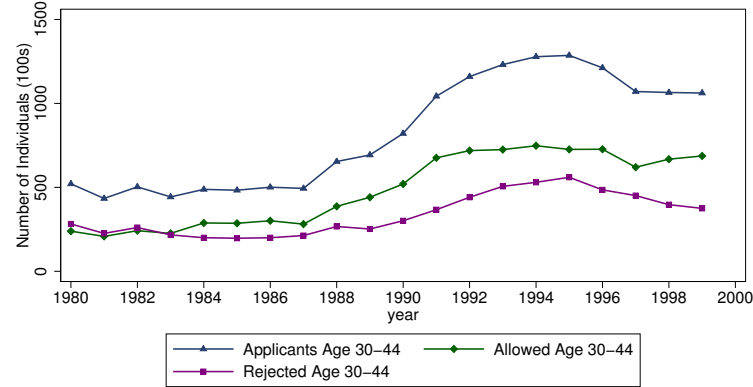
Panel C: Average Annual Earnings Pre–Application of All DI Applicants,
Allowed, and Rejected Applicants, Women Age 45–54
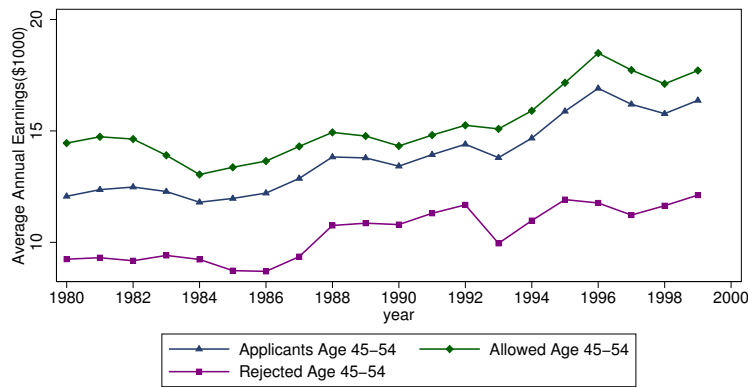
Panel D: Average Annual Earnings Pre–Application of All DI Applicants,
Allowed, and Rejected Applicants, Women Age 30–44
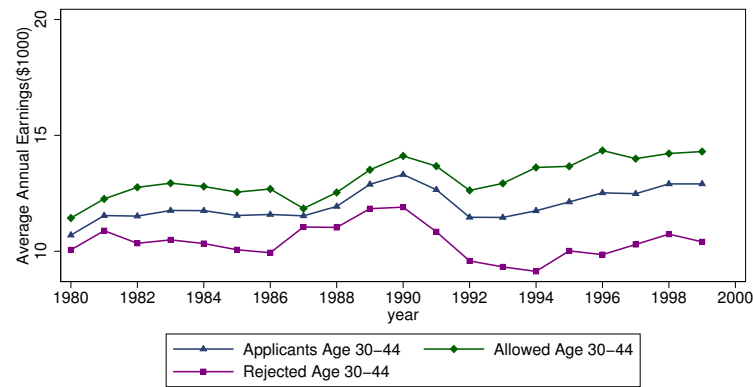
Source: 1% Files of Social Security administrative data (see text).

Appendix Figure 4: Median Positive Annual Earnings for Initial Allowed and Final Rejected Male DI Applicants Before and After Application for Disability Insurance
Sample with Stable Employment Prior to Application

Panel A: Allowed and Rejected Applicants, Age 45–64
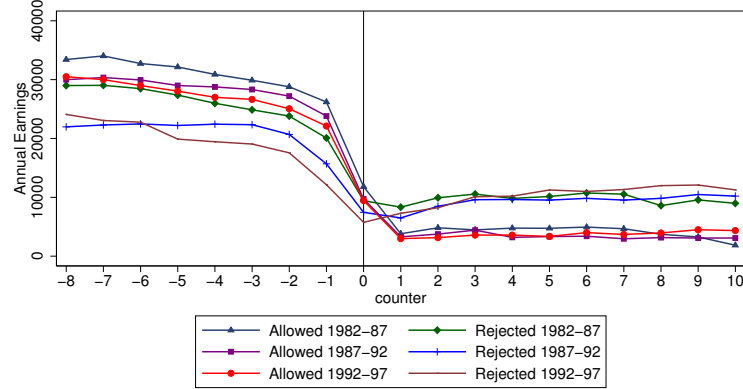
Panel B: Allowed and Rejected Applicants, Age 30–44
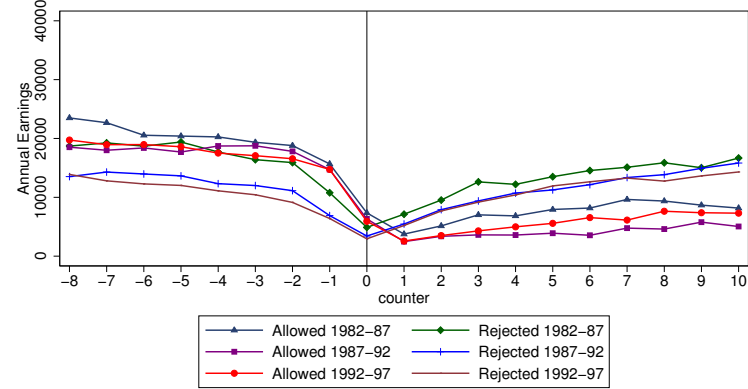
Panel C: Allowed and Rejected Applicants with Stable Employment in Baseline, Age 45–64
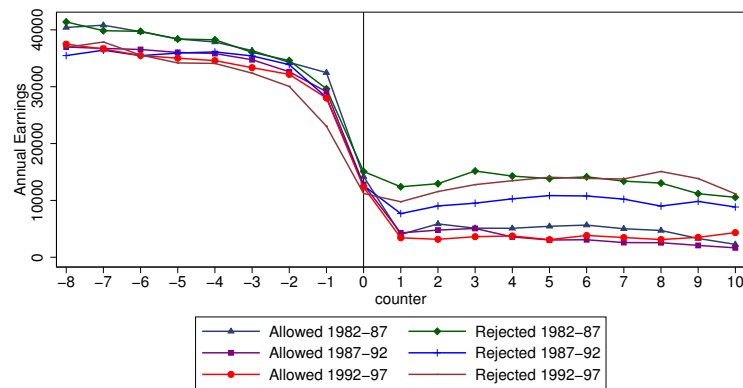
Panel D: Allowed and Rejected Applicants with Stable Employment in Baseline, Age 30–44
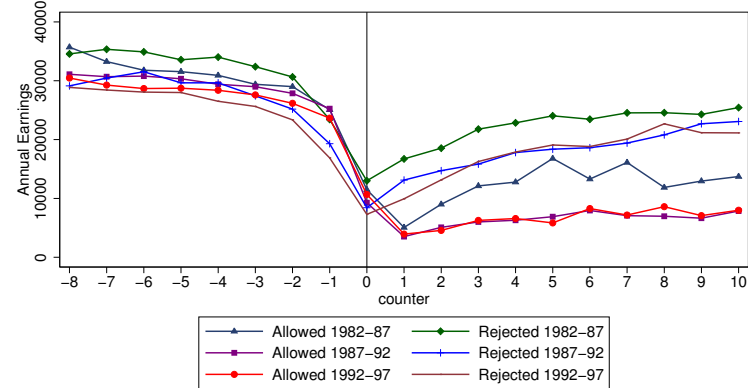
Source: 1% Files of Social Security administrative data (see text).

Appendix Figure 5: Role of Initially Rejected and Later Allowed Applicants, Fraction of Total and Average Earnings Five Years Before and After Application to DI

Panel A: Fraction of Applicants Initially Rejected and Later Allowed (Reversals), Age 45–54
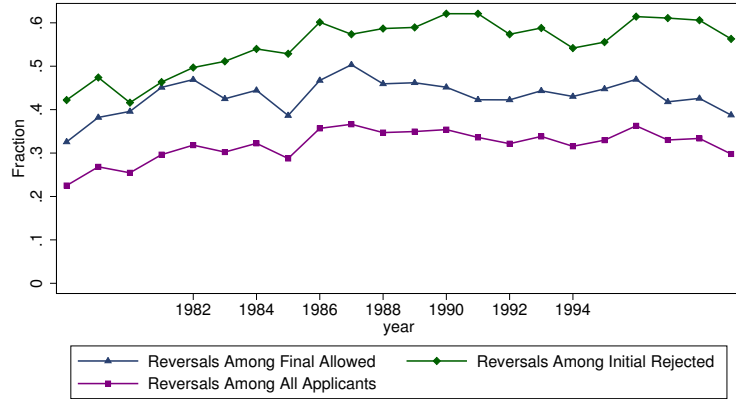
Panel B: Annual Earnings ($1000) for Init. Rejected and Later Allowed (Reversals), Age 45–54
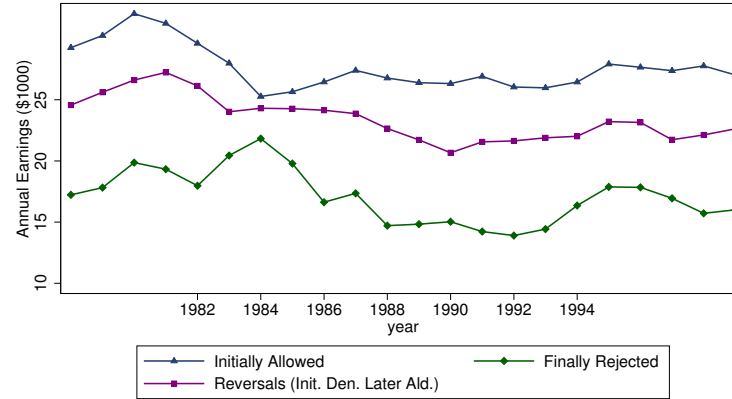
Panel C: Fraction of Applicants Initially Rejected and Later Allowed (Reversals), Age 30–44
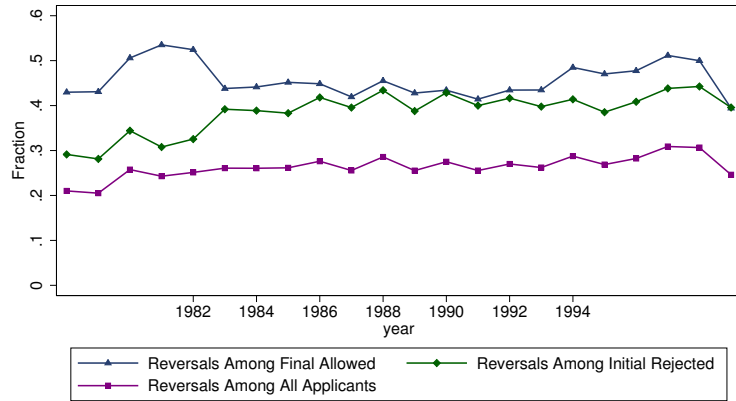
Panel D: Annual Earnings ($1000) for Init. Rejected and Later Allowed (Reversals), Age 30–44
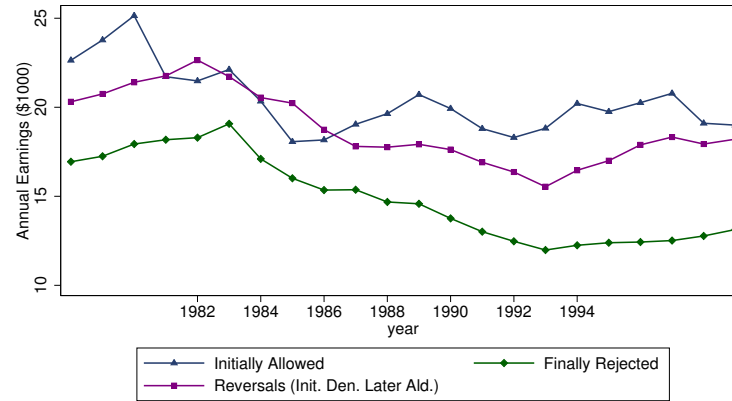
Source: 1% Files of Social Security administrative data (see text).

Appendix Figure 6: Average Annual Employment and Earnings for Allowed and Rejected Male DI Applicants, Including Initially Rejected but Finally Allowed Applicants

Panel A: Annual Fraction Employed Allowed and Rejected Applicants, Age 45–64
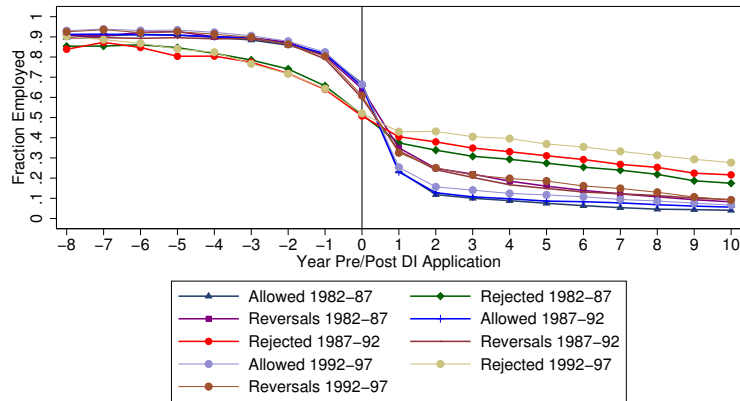
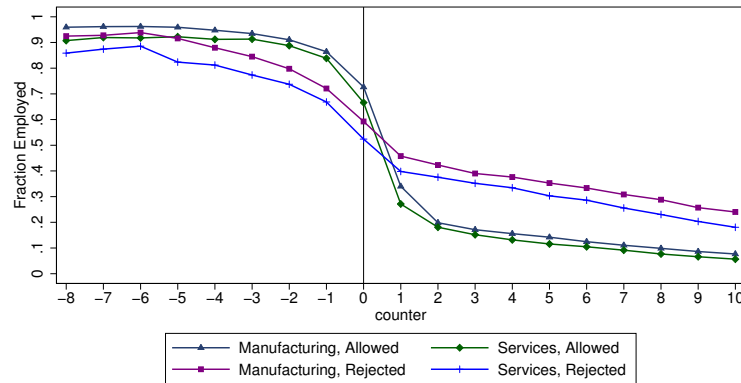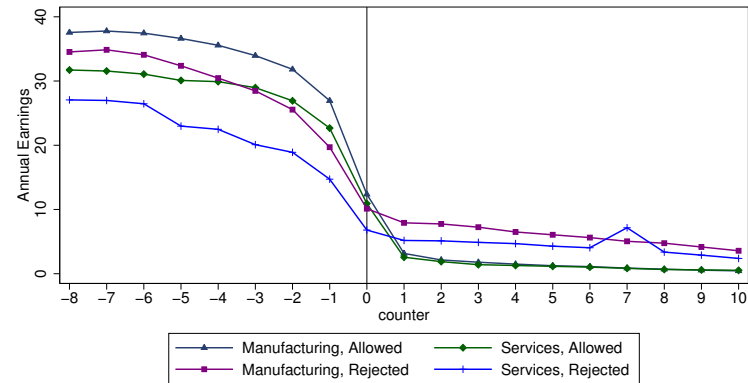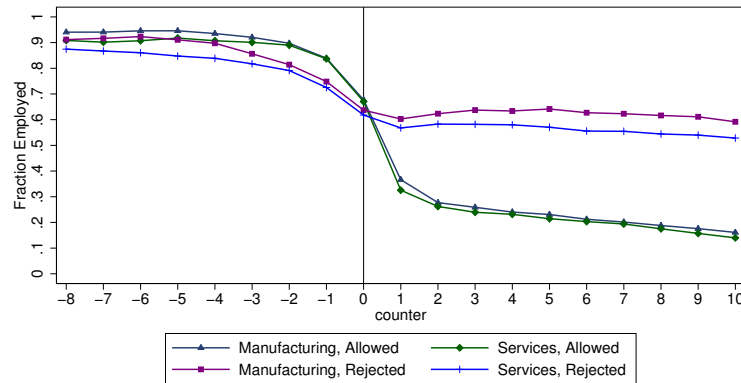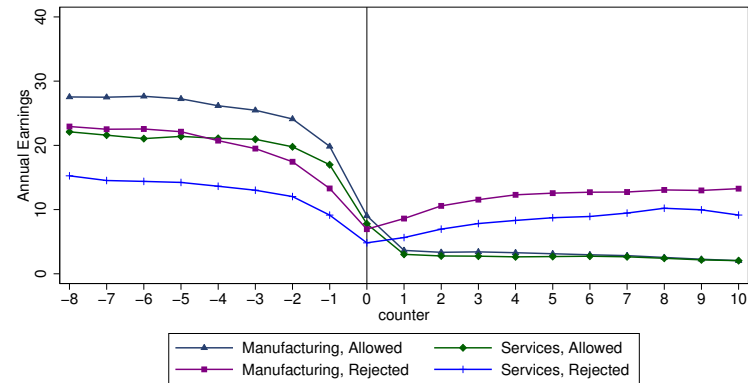Panel B: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 45–64
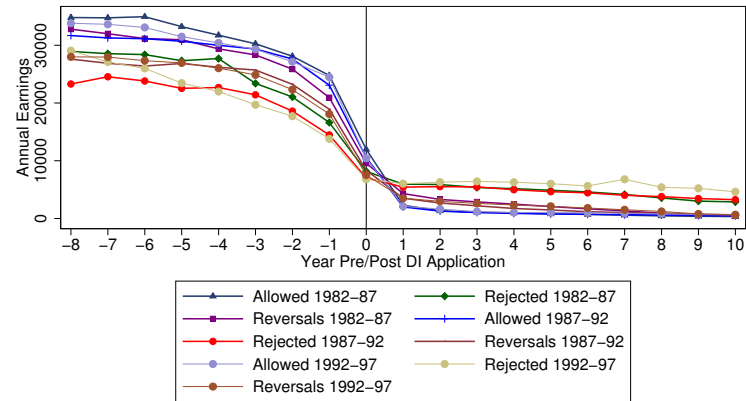
Panel C: Annual Fraction Employed Allowed and Rejected Applicants, Age 30–44
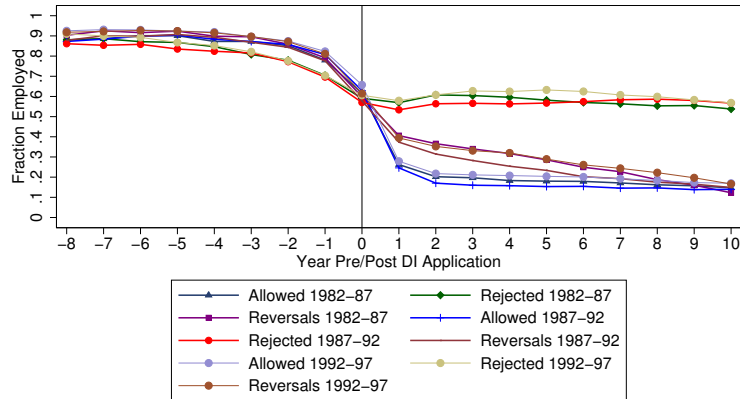
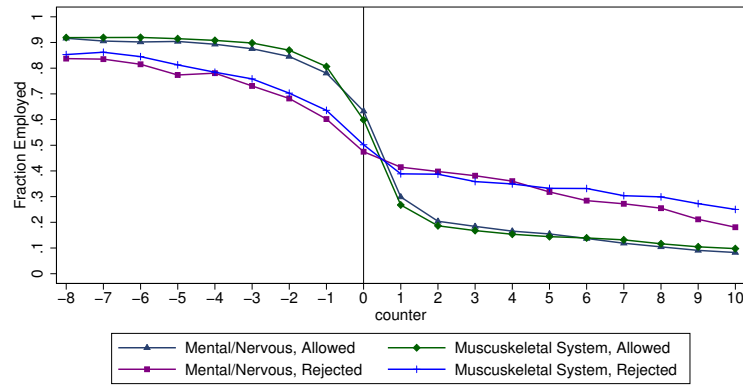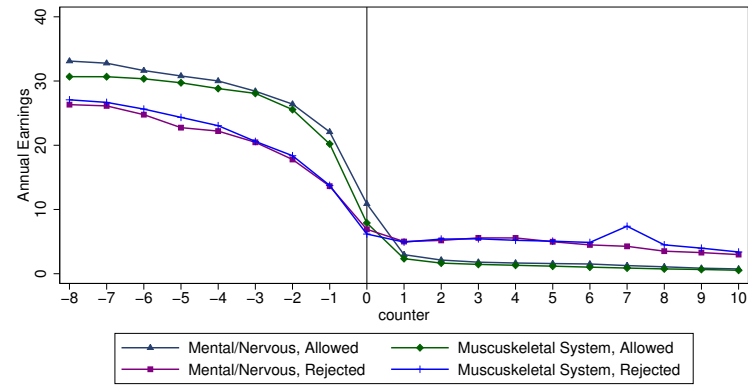Panel D: Annual Earnings ($1000) Allowed and Rejected Applicants, Age 30–44
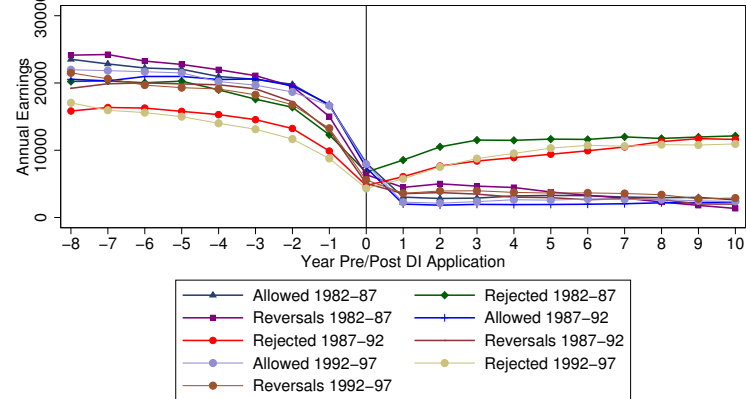
Source: 1% Files of Social Security administrative data (see text).

Appendix Figure 7A: Trends in Employment and Earnings for Men Age 45–64 Initially Allowed Beneficiaries, Rejected Applicants, and Non–Applicants Selected Application Years

Panel A: Annual Fraction Employed by Year
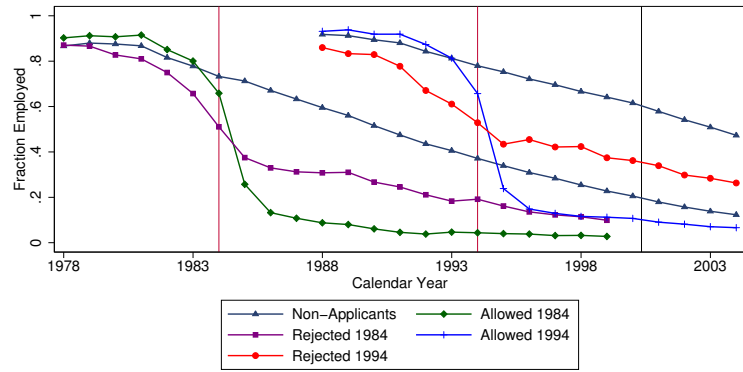
Panel B: Average Annual Earnings by Year
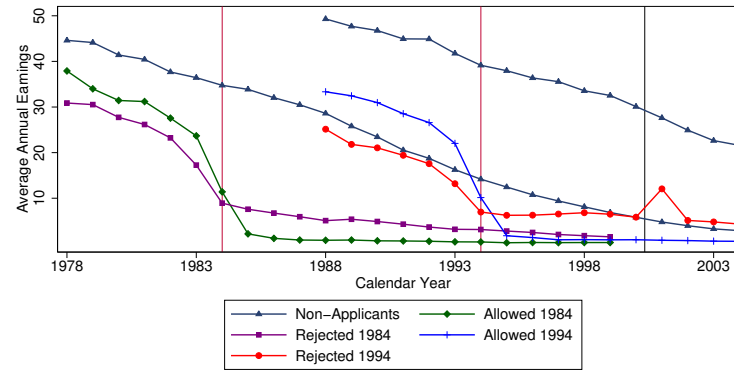
Panel C: Average Annual Positive Earnings by Year
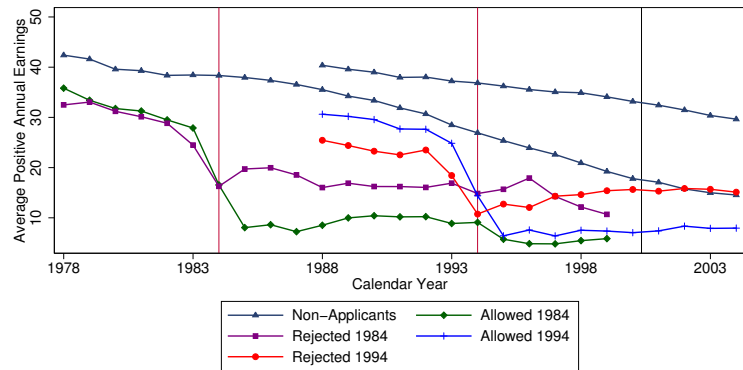
Source: 1% Files of Social Security administrative data (see text). The figure shows two lines for non–applicants, corresponding to two cohorts in the relevant age–range in 1982 and 1992.

Appendix Figure 7B: Trends in Employment and Earnings for Men Age 30–44 Initially Allowed Beneficiaries, Rejected Applicants, and Non–Applicants Selected Application Years

Panel A: Annual Fraction Employed by Year
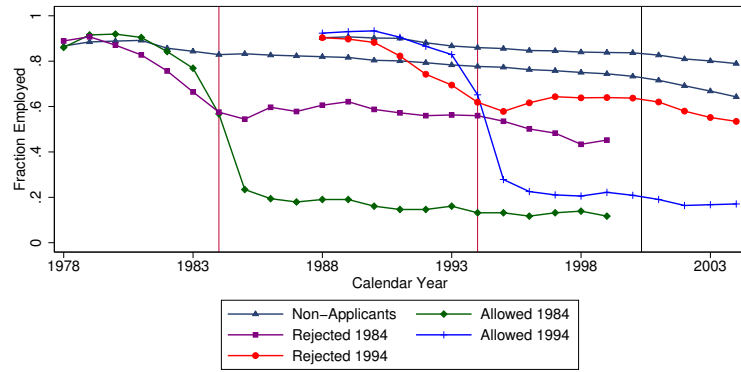
Panel B: Average Annual Earnings by Year
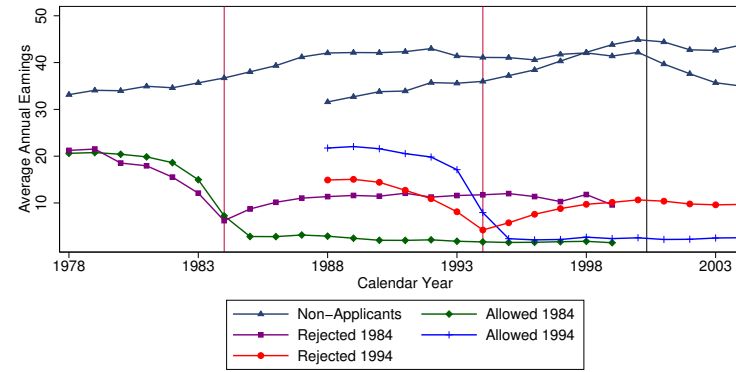
Panel C: Average Annual Positive Earnings by Year
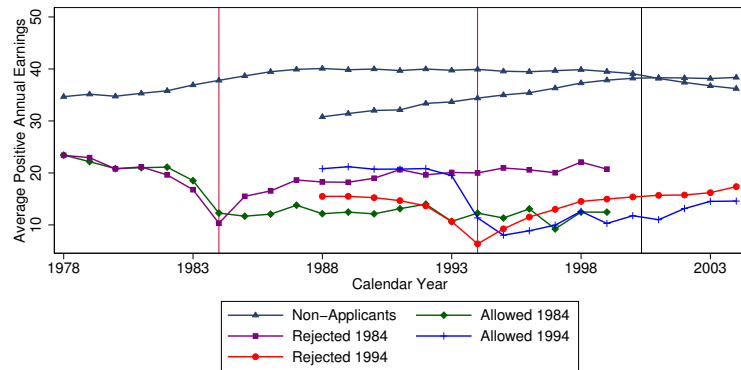
Source: 1% Files of Social Security administrative data (see text). The figure shows two lines for non–applicants, corresponding to two cohorts in the relevant age–range in 1982 and 1992.

Appendix Figure 8: Difference in Positive Earnings Between Allowed or Rejected and Non−Applicants Before and After DI Application, Full Regression Specification

Panel A: Difference in Positive Annual Earnings ($1000) Relative to Non−Applicants
Male Applicants Age 45−64

Panel B: Difference in Positive Annual Earnings ($1000) Relative to Non−Applicants
Male Applicants Age 30−44

Allowed 1982−87	Rejected 1982−87
Allowed 1987−92	Rejected 1987−92
Allowed 1992−97	Rejected 1992−97
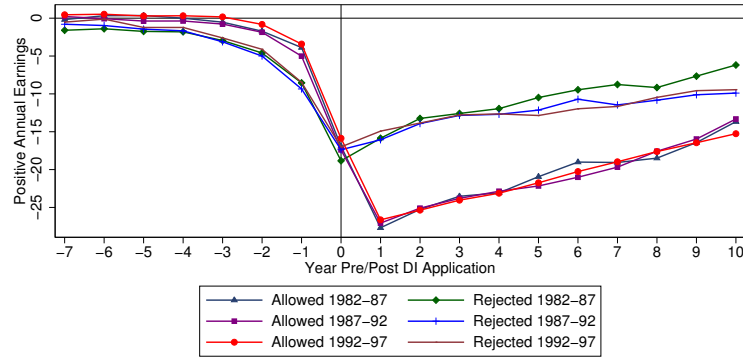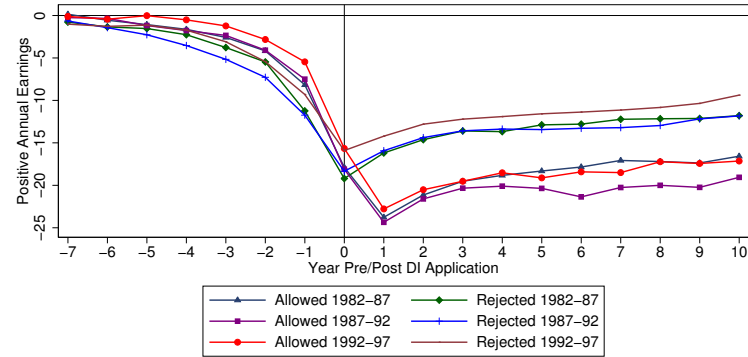
Panel C: Difference in Positive Annual Earnings ($1000) Relative to Non−Applicants
Female Applicants Age 45−64

Panel D: Difference in Positive Annual Earnings ($1000) Relative to Non−Applicants
Female Applicants Age 30−44

Allowed 1982−87	Rejected 1982−87
Allowed 1987−92	Rejected 1987−92
Allowed 1992−97	Rejected 1992−97
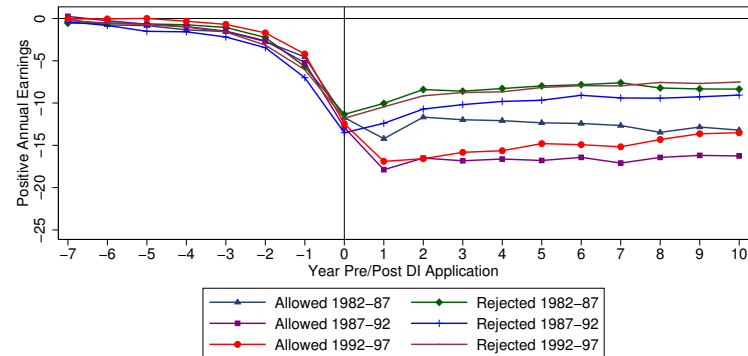
Source: 1% Files of Social Security administrative data (see text). Regression specification includes a quartic in age, a quartic in baseline average annual earnings, and year dummies interacted with ten dummies for earnings class prior to application and twelve industry dummies (see text for details).

Table 1: Employment, Earnings, and Other Characteristics of Rejected Disability Insurance Applicants, New Beneficiaries, and Non-Applicants (Men, Age 45-64)

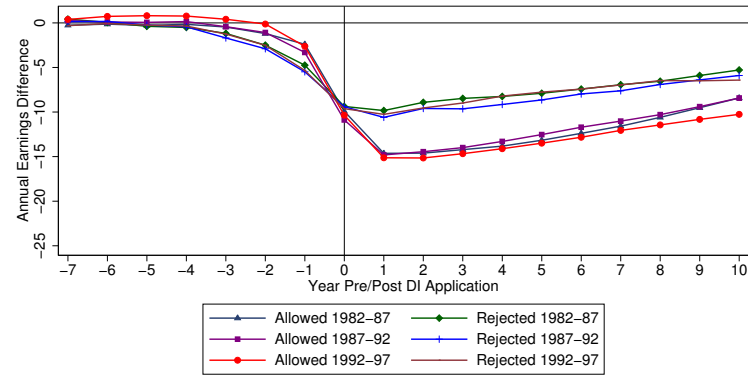| Application Year	1982				1987				1992			
Application Status	Non-Applicants	Rejected Applicants	New Beneficiaries	Initially Denied Beneficiaries	Non-Applicants	Rejected Applicants	New Beneficiaries	Initially Denied Beneficiaries	Non-Applicants	Rejected Applicants	New Beneficiaries	Initially Denied Beneficiaries
Labor Supply and Earnings 2 Years After Application												
Percent Positive Covered Earnings	73.3	*40.4*	9.6	25.4	75.9	*48.1*	12.9	27.3	78.0	*44.8*	14.8	28.0
Percent Earnings Above Minimum Amount[a]	70.2	*31.6*	6.3	18.4	72.4	*38.4*	8.7	20.7	73.6	*36.6*	8.6	19.4
Average Annual Earnings	34759	*6672*	1254	3785	38888	*8367*	1287	4099	39153	*5838*	1470	3284
Median Positive Annual Earnings	37000	*10000*	4500	8000	37000	*8000*	5000	9000	35000	*8000*	4000	5000
Demographics												
Median Age at Application	52	*55*	56	52	52	*54*	56	51	50	*52*	55	50
Percent Non-White	11.1	*20.6*	14.3	17.8	12.0	*16.6*	17.8	19.4	14.9	*26.8*	18.9	19.9
Median Years of Schooling	--	*--*	--	--	--	*11*	12	10	--	*12*	12	12
Percent with Health Condition												
Muscuskeletal System	--	*--*	--	--	--	*27.2*	9.9	29.9	--	*32.2*	18.0	38.5
Circulatory System	--	*--*	--	--	--	*20.8*	28.7	28.6	--	*16.7*	24.6	19.2
Mental Disorders/Nervous System	--	*--*	--	--	--	*15.0*	15.5	11.5	--	*14.3*	18.1	13.5
Respiratory System	--	*--*	--	--	--	*7.2*	8.5	5.9	--	*4.5*	7.5	5.0
Digestive System	--	*--*	--	--	--	*3.2*	2.3	1.8	--	*3.1*	1.7	1.7
Genitourinary System	--	*--*	--	--	--	*0.6*	1.2	0.0	--	*0.0*	1.6	0.3
Neoplasms	--	*--*	--	--	--	*2.6*	22.7	2.8	--	*2.3*	17.7	3.1
Metabolic	--	*--*	--	--	--	*5.5*	4.3	3.8	--	*5.2*	2.6	3.3
Infectuous Diseases	--	*--*	--	--	--	*1.2*	0.4	0.0	--	*0.9*	3.2	0.3
Injuries	--	*--*	--	--	--	*7.8*	3.7	7.9	--	*11.7*	3.3	8.1
Other, Missing	--	*--*	--	--	--	*9.0*	2.9	7.7	--	*6.8*	1.8	6.8
Fraction Dead 2 Years After Application	4.5	*7.6*	34.8	4.4	3.9	*8.3*	33.3	2.3	3.1	*4.9*	24.3	2.9
Fraction Dead 4 Years After Application	6.1	*11.9*	42.9	9.7	5.4	*12.0*	40.6	8.4	4.4	*8.0*	33.0	7.6
Number of Obsevations	151945	*582*	961	472	153600	*349*	751	392	170520	*426*	1465	578

Source: 1% Files of Social Security administrative data (see text).

Notes: Earnings are in 2000 dollars adjusted by the CPI. Applications refer to initial application to receive benefits from Social Security Disability Insurance (DI). "Rejected applicants" are those applicants that are rejected in the administrative stage of the screening process and do not receive benefits within ten years of initial applicatoin. "New Beneficiaries" are those applicants that are awarded benefits in the administrative stage of the screening process. "Initially Rejected New Beneficiaries" are those applicants that are rejected in the administrative stage of the screening process but receive benefits within ten years of

Table 2: Employment, Earnings, and Other Characteristics of Rejected Disability Insurance Applicants, New Beneficiaries, and Non-Applicants (Men, Age 30-44)

Application Year	1982				1987				1992			
Application Status	Non-Applicants	Rejected Applicants	New Beneficiaries	Initially Denied Beneficiaries	Non-Applicants	Rejected Applicants	New Beneficiaries	Initially Denied Beneficiaries	Non-Applicants	Rejected Applicants	New Beneficiaries	Initially Denied Beneficiaries
Labor Supply and Earnings 2 Years After Application												
Percent Positive Covered Earnings	82.9	*59.8*	25.0	41.4	86.7	*70.9*	20.2	35.9	86.0	*59.7*	22.0	30.8
Percent Earnings Above Minimum Amount[a]	79.5	*50.7*	13.8	25.6	83.5	*55.8*	9.9	25.3	82.2	*44.6*	12.4	21.0
Average Annual Earnings	36725	*10393*	2702	5541	39333	*10751*	1933	3512	35997	*6387*	1940	3712
Median Positive Annual Earnings	37000	*10000*	2000	5000	36000	*9000*	2000	5000	32000	*6000*	3000	6000
Demographics												
Median Age at Application	33	*34*	35	36	34	*33*	35	36	34	*34*	35	36
Percent Non-White	17.9	*28.4*	24.5	20.0	20.0	*29.9*	24.4	26.7	23.9	*39.5*	36.1	30.8
Median Years of Schooling	--	*--*	--	--	--	*12*	12	12	--	*12*	12	12
Percent with Health Condition												
Muscuskeletal System	--	*--*	--	--	--	*31.3*	5.1	38.7	--	*37.5*	4.8	41.4
Circulatory System	--	*--*	--	--	--	*3.0*	8.7	8.0	--	*3.1*	5.4	5.3
Mental Disorders/Nervous System	--	*--*	--	--	--	*25.5*	40.8	21.7	--	*22.3*	38.5	19.7
Respiratory System	--	*--*	--	--	--	*0.8*	1.3	1.4	--	*2.5*	0.4	1.5
Digestive System	--	*--*	--	--	--	*2.2*	2.6	2.8	--	*1.9*	1.9	2.4
Genitourinary System	--	*--*	--	--	--	*0.0*	2.6	0.5	--	*0.1*	3.6	0.4
Neoplasms	--	*--*	--	--	--	*2.4*	10.6	3.3	--	*1.1*	7.6	0.4
Metabolic	--	*--*	--	--	--	*1.4*	9.3	1.4	--	*2.1*	3.4	2.8
Infectuous Diseases	--	*--*	--	--	--	*0.5*	8.7	0.5	--	*1.8*	27.4	4.6
Injuries	--	*--*	--	--	--	*23.9*	4.5	14.2	--	*15.9*	5.2	11.8
Other, Missing	--	*--*	--	--	--	*9.0*	5.8	7.5	--	*11.7*	1.6	9.6
Fraction Dead 2 Years After Application	1.3	*3.6*	23.5	4.2	1.1	*2.2*	26.3	1.4	1.1	*1.5*	25.0	1.7
Fraction Dead 4 Years After Application	1.7	*4.9*	28.6	7.0	1.5	*3.8*	31.4	3.7	1.5	*2.9*	33.2	6.1
Number of Obsevations	189920	*450*	196	215	229060	*371*	312	217	271080	*719*	668	458

Source: 1% Files of Social Security administrative data (see text).

Notes: Earnings are in 2000 dollars adjusted by the CPI. Applications refer to initial application to receive benefits from Social Security Disability Insurance (DI). "Rejected applicants" are those applicants that are rejected in the administrative stage of the screening process and do not receive benefits within ten years of initial applicatoin."New Beneficiaries" are those applicants that are awarded benefits in the administrative stage of the screening process. "Initially Rejected New Beneficiaries" are those applicants that are rejected in the administrative stage of the screening process but receive benefits within ten years

[a] The minimum earnings threshold used corresponds to earnings from three months of full time employment at 2000 minimum wages.

Table 3: Employment, Earnings, and Other Characteristics of Rejected Disability Insurance Applicants, New Beneficiaries, and Non-Applicants (Women, Age 45-64)

Application Year	1982				1987				1992			
Application Status	Non-Applicants	Rejected Applicants	New Beneficiaries	Initially Denied Beneficiaries	Non-Applicants	Rejected Applicants	New Beneficiaries	Initially Denied Beneficiaries	Non-Applicants	Rejected Applicants	New Beneficiaries	Initially Denied Beneficiaries
Labor Supply and Earnings 2 Years After Application												
Percent Positive Covered Earnings	68.2	*33.9*	6.4	34.1	73.6	*43.1*	15.7	29.6	75.8	*44.2*	15.4	24.7
Percent Earnings Above Minimum Amount[a]	62.2	*24.9*	5.1	24.8	67.7	*30.3*	10.5	22.3	69.9	*32.3*	9.3	16.3
Average Annual Earnings	14187	*3177*	550	3152	16601	*4412*	1109	3292	18827	*5074*	988	1828
Median Positive Annual Earnings	18000	*6000*	5000	6000	19000	*7000*	5000	7000	20000	*7000*	3000	4000
Demographics												
Median Age at Application	52	*55*	55	52	51	*54*	55	52	50	*51*	53	50
Percent Non-White	12.5	*18.2*	19.0	21.1	13.5	*20.2*	19.5	27.1	15.2	*25.6*	20.3	25.4
Median Years of Schooling	--	*--*	--	--	--	*12*	12	11	--	*12*	12	12
Percent with Health Condition												
Muscuskeletal System	--	*--*	--	--	--	*32.2*	15.7	36.7	--	*37.2*	17.0	40.2
Circulatory System	--	*--*	--	--	--	*16.1*	17.7	17.6	--	*12.1*	14.1	13.0
Mental Disorders/Nervous System	--	*--*	--	--	--	*8.6*	17.7	14.5	--	*16.2*	24.9	14.9
Respiratory System	--	*--*	--	--	--	*4.5*	8.6	5.2	--	*3.8*	7.7	4.6
Digestive System	--	*--*	--	--	--	*2.6*	0.7	0.7	--	*1.6*	1.1	1.3
Genitourinary System	--	*--*	--	--	--	*1.9*	0.9	0.7	--	*1.3*	2.7	1.1
Neoplasms	--	*--*	--	--	--	*4.9*	26.4	2.8	--	*2.7*	20.7	2.5
Metabolic	--	*--*	--	--	--	*7.1*	4.8	8.0	--	*6.7*	6.7	6.1
Infectuous Diseases	--	*--*	--	--	--	*0.0*	0.2	0.0	--	*0.8*	0.7	0.4
Injuries	--	*--*	--	--	--	*10.1*	2.3	6.6	--	*5.1*	2.0	6.9
Other, Missing	--	*--*	--	--	--	*12.0*	5.0	7.3	--	*12.4*	2.5	9.0
Fraction Dead 2 Years After Application	1.8	*3.1*	35.2	3.3	1.7	*4.1*	25.5	2.4	1.4	*2.4*	20.2	1.7
Fraction Dead 4 Years After Application	2.6	*5.6*	41.9	6.5	2.5	*6.0*	31.6	5.8	2.1	*4.3*	27.3	3.6
Number of Obsevations	128465	*413*	389	246	136040	*267*	440	291	160560	*371*	915	523

Source: 1% Files of Social Security administrative data (see text).

Notes: Earnings are in 2000 dollars adjusted by the CPI. Applications refer to initial application to receive benefits from Social Security Disability Insurance (DI). "Rejected applicants" are those applicants that are rejected in the administrative stage of the screening process and do not receive benefits within ten years of initial applicatoin."New Beneficiaries" are those applicants that are awarded benefits in the administrative stage of the screening process. "Initially Rejected New Beneficiaries" are those applicants that are rejected in the administrative stage of the screening process but receive benefits within ten years of

[a] The minimum earnings threshold used corresponds to earnings from three months of full time employment at 2000 minimum wages.

Table 4: Employment, Earnings, and Other Characteristics of Rejected Disability Insurance Applicants, New Beneficiaries, and Non-Applicants (Women, Age 30-44)

Application Year	1982				1987				1992			
Application Status	Non-Applicants	Rejected Applicants	New Beneficiaries	Initially Denied Beneficiaries	Non-Applicants	Rejected Applicants	New Beneficiaries	Initially Denied Beneficiaries	Non-Applicants	Rejected Applicants	New Beneficiaries	Initially Denied Beneficiaries
Labor Supply and Earnings 2 Years After Application												
Percent Positive Covered Earnings	76.3	*61.1*	21.3	35.9	82.5	*63.7*	30.1	39.7	82.6	*62.1*	24.8	36.0
Percent Earnings Above Minimum Amount[a]	69.6	*42.7*	17.6	23.4	76.4	*47.8*	15.4	25.0	76.5	*44.9*	14.5	20.2
Average Annual Earnings	16897	*6634*	2275	2854	20226	*7915*	2219	2864	20695	*5793*	1596	2579
Median Positive Annual Earnings	19000	*7000*	9000	3500	21000	*7500*	2000	4000	20000	*5000*	3000	3000
Demographics												
Median Age at Application	33	*35*	35	36	34	*35*	36	35	34	*35*	36	36
Percent Non-White	17.8	*25.2*	21.3	30.5	19.4	*29.4*	19.1	30.9	22.9	*33.2*	27.9	31.5
Median Years of Schooling	--	*--*	--	--	--	*12*	12	12	--	*12*	12	12
Percent with Health Condition												
Muscuskeletal System	--	*--*	--	--	--	*30.2*	6.6	28.7	--	*33.3*	7.9	36.6
Circulatory System	--	*--*	--	--	--	*8.5*	5.9	8.1	--	*3.5*	4.3	5.0
Mental Disorders/Nervous System	--	*--*	--	--	--	*16.1*	42.6	25.0	--	*26.7*	50.0	27.8
Respiratory System	--	*--*	--	--	--	*6.5*	0.7	2.9	--	*3.8*	2.1	1.3
Digestive System	--	*--*	--	--	--	*3.5*	2.9	2.9	--	*2.1*	1.9	2.2
Genitourinary System	--	*--*	--	--	--	*0.5*	3.7	1.5	--	*1.4*	1.9	0.9
Neoplasms	--	*--*	--	--	--	*1.5*	19.1	2.9	--	*1.7*	13.1	2.2
Metabolic	--	*--*	--	--	--	*4.5*	5.9	7.4	--	*2.4*	8.8	6.6
Infectuous Diseases	--	*--*	--	--	--	*0.5*	2.9	2.2	--	*0.9*	4.0	1.9
Injuries	--	*--*	--	--	--	*15.6*	2.9	9.6	--	*10.6*	2.4	5.7
Other, Missing	--	*--*	--	--	--	*12.6*	6.6	8.8	--	*13.7*	3.6	9.8
Fraction Dead 2 Years After Application	0.4	*0.0*	23.1	2.3	0.4	*1.0*	21.3	2.2	0.4	*1.4*	13.6	1.3
Fraction Dead 4 Years After Application	0.6	*0.9*	28.7	4.7	0.6	*1.5*	22.1	4.4	0.6	*1.9*	16.9	1.6
Number of Obsevations	163415	*234*	108	128	207075	*201*	136	136	248120	*425*	420	317

Source: 1% Files of Social Security administrative data (see text).

Notes: Earnings are in 2000 dollars adjusted by the CPI. Applications refer to initial application to receive benefits from Social Security Disability Insurance (DI). "Rejected applicants" are those applicants that are rejected in the administrative stage of the screening process and do not receive benefits within ten years of initial applicatoin."New Beneficiaries" are those applicants that are awarded benefits in the administrative stage of the screening process. "Initially Rejected New Beneficiaries" are those applicants that are rejected in the administrative stage of the screening process but receive benefits within ten years of

[a] The minimum earnings threshold used corresponds to earnings from three months of full time employment at 2000 minimum wages.

Table 5: Employment and Earnings of Rejected Disability Insurance Applicants and New Beneficiaries by Characteristics and Different Age-Groups (Men)

Application Status	Fraction Positive Annual Earnings				Median of Positive Annual Earnings			
	New Beneficiaries		Rejected Applicants		New Beneficiaries		Rejected Applicants	
Before/After Application	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Panel A: Male Workers Age 45-64								
Average Earnings Prior to Application								
High (Above Median)	94.7	13.4	90.0	41.4	32749	4515	30940	13286
Low (Below Median)	60.7	8.6	50.3	24.3	9349	4149	6373	7553
Primary Health Condition at Application								
Muscuskeletal System	86.1	14.8	75.0	39.1	27496	4097	22311	11220
Circulatory System	84.0	11.8	73.2	30.0	27827	4386	25221	10532
Mental Disorders/Nervous System	83.5	15.4	69.6	33.4	25802	4140	16956	9883
Respiratory System	85.1	8.4	67.1	19.0	26054	3394	17005	8442
Neoplasms	83.9	3.5	71.9	27.7	30465	6800	23394	9711
Infectuous Diseases	84.4	7.3	62.7	26.8	23336	5498	15866	11352
Injuries	84.0	15.0	77.4	46.1	24494	5804	20428	14723
Industry of Employment Prior to Application								
Manufacturing	94.5	15.3	88.9	42.0	33033	3896	28654	12205
Services	89.6	12.9	81.2	36.3	23678	4292	16979	10522
Panel B: Male Workers Age 30-44								
Average Earnings Prior to Application								
High (Above Median)	95.1	22.4	92.4	67.9	26107	8248	24946	17950
Low (Below Median)	79.7	21.0	73.8	52.7	7863	4130	5931	7867
Primary Health Condition at Application								
Muscuskeletal System	89.1	23.1	84.8	62.4	19838	7702	15857	13713
Circulatory System	89.8	18.8	82.4	53.9	18357	5489	13736	12172
Mental Disorders/Nervous System	86.7	26.2	79.7	56.7	14569	3977	9716	9377
Respiratory System	88.1	19.0	80.5	48.3	14669	8297	8808	9113
Neoplasms	87.6	10.0	81.5	59.4	22633	13895	17439	17371
Infectuous Diseases	88.7	11.1	81.6	41.1	17073	4783	8517	8151
Injuries	88.2	26.6	84.9	65.6	17296	9215	13888	13686
Industry of Employment Prior to Application								
Manufacturing	92.6	23.5	89.6	65.8	21157	6609	17310	13654
Services	90.2	23.9	84.1	58.5	15152	5322	9533	9721

Notes: Earnings are in 2000 dollars adjusted by the CPI. Applications refer to initial application to receive benefits from Social Security Disability Insurance (DI). "Rejected applicants" are those applicants that are rejected in the administrative stage of the screening process and do not receive benefits within ten years of initial applicatoin."New Beneficiaries" are those applicants that are awarded benefits in the administrative stage of the screening process. "Initially Rejected New Beneficiaries" are those applicants that are rejected in the administrative stage of the screening process but receive benefits within ten years of application.

Table 6: Employment and Earnings of Rejected Disability Insurance Applicants and New Beneficiaries by Characteristics and Different Age-Groups (Women)

Application Status	Fraction Positive Annual Earnings				Median of Positive Annual Earnings			
	New Beneficiaries		Rejected Applicants		New Beneficiaries		Rejected Applicants	
Before/After Application	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Panel A: Female Workers Age 45-64								
Average Earnings Prior to Application								
High (Above Median)	96.2	16.0	91.7	41.5	23229	4514	22209	11218
Low (Below Median)	80.7	11.4	64.0	29.6	8650	3568	7100	6795
Primary Health Condition at Application								
Muscuskeletal System	89.2	15.7	78.6	37.2	15772	4054	12723	8254
Circulatory System	89.2	12.0	73.7	25.3	15217	3856	11708	6599
womental Disorders/Nervous System	86.9	17.1	72.3	37.0	15403	3841	12119	9061
Respiratory System	88.5	8.7	68.0	26.3	15223	3509	11701	6902
Neoplasms	89.1	5.6	76.8	33.9	17629	5970	14582	11447
Infectuous Diseases	87.7	17.1	59.0	27.3	19435	7028	19363	13842
Injuries	89.9	17.5	84.4	47.6	15180	4576	13077	9782
Industry of Employwoment Prior to Application								
Manufacturing	93.9	13.6	87.5	37.7	17889	4188	15231	9067
Services	91.6	15.1	85.0	39.8	15666	4337	12200	8396
Panel B: Female Workers Age 30-44								
Average Earnings Prior to Application								
High (Above Median)	96.1	27.5	93.6	72.5	23614	6048	22334	16464
Low (Below Median)	84.1	24.0	78.4	58.8	7442	4073	5982	7617
Primary Health Condition at Application								
Muscuskeletal System	89.9	24.1	85.3	64.3	12835	5456	10241	10132
Circulatory System	90.7	25.4	82.7	53.4	12155	4594	7688	8654
womental Disorders/Nervous System	88.0	28.6	81.2	61.6	12113	3949	8926	8741
Respiratory System	85.9	18.9	84.4	54.0	9934	4100	7871	8560
Neoplasms	89.1	12.1	86.4	75.0	15573	11609	11893	17081
Infectuous Diseases	87.0	17.6	71.5	52.3	13282	5125	6549	7150
Injuries	88.8	30.4	86.4	70.0	11538	5210	9750	10758
Industry of Employwoment Prior to Application								
Manufacturing	92.3	24.3	89.2	66.3	14871	4893	13240	10695
Services	90.2	27.4	86.5	66.1	12405	4955	8670	9725

Notes: Earnings are in 2000 dollars adjusted by the CPI. Applications refer to initial application to receive benefits from Social Security Disability Insurance (DI). "Rejected applicants" are those applicants that are rejected in the administrative stage of the screening process and do not receive benefits within ten years of initial applicatoin."New Beneficiaries" are those applicants that are awarded benefits in the administrative stage of the screening process. "Initially Rejected New Beneficiaries" are those applicants that are rejected in the administrative stage of the screening process but receive benefits within ten years of application.

Table 7: Fraction Dead 10 Years After Application, Rejected Disability Insurance Applicants and New Beneficiaries by Characteristics, Different Age-Groups

Application Status	Men		Women	
	Beneficiaries	Applicants	Beneficiaries	Applicants
Panel A: Male Workers Age 45-64				
Average Earnings Prior to Application				
High (Above Median)	16.3	9.3	12.2	5.1
Low (Below Median)	16.5	13.1	11.5	7.1
Primary Health Condition at Application				
Muscuskeletal System	8.4	6.3	5.7	3.6
Circulatory System	21.5	13.8	18.1	9.2
Mental Disorders/Nervous System	15.2	10.6	9.2	5.6
Respiratory System	29.9	16.5	26.7	10.8
Neoplasms	11.2	16.5	13.1	10.9
Infectuous Diseases	16.1	12.8	11.4	10.5
Injuries	11.8	6.5	8.6	4.9
Industry of Employment Prior to Application				
Manufacturing	16.7	9.6	10.3	5.5
Services	17.1	11.8	11.9	5.4
Panel B: Male Workers Age 30-44				
Average Earnings Prior to Application				
High (Above Median)	8.7	3.6	5.7	1.1
Low (Below Median)	10.0	5.0	5.5	2.6
Primary Health Condition at Application				
Muscuskeletal System	3.8	2.5	2.0	1.3
Circulatory System	13.9	5.5	9.6	4.5
Mental Disorders/Nervous System	7.8	5.5	4.2	2.3
Respiratory System	8.4	5.4	9.8	0.9
Neoplasms	9.7	4.7	11.1	4.9
Infectuous Diseases	18.9	12.1	12.0	8.2
Injuries	5.6	2.5	3.6	1.6
Industry of Employment Prior to Application				
Manufacturing	8.6	4.0	4.5	1.5
Services	10.4	5.3	5.9	2.2

Notes: Earnings are in 2000 dollars adjusted by the CPI. Applications refer to initial application to receive benefits from Social Security Disability Insurance (DI). "Rejected applicants" are those applicants that are rejected in the administrative stage of the screening process and do not receive benefits within ten years of initial applicatoin."New Beneficiaries" are those applicants that are awarded benefits in the administrative stage of the screening process. "Initially Rejected New Beneficiaries" are those applicants that are rejected in the administrative stage of the screening process but receive benefits within ten years of application.

Table 8: Employment and Earnings Differences Before and After Application to SSDI Relative to Non-Applicants, Effects for Initially Allowed Beneficiaries and Rejected Applicants, Men Age 45-64

	Application During 1982-1987				Application During 1987-1992				Application During 1992-1997			
	No Covariates		Full Model		No Covariates		Full Model		No Covariates		Full Model	
	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary
A. Employment												
Baseline Difference vs. Non-Applicants	**0.094**	0.113	**0.089**	0.043	**0.058**	0.118	**0.061**	0.041	**0.049**	0.069	**0.090**	0.056
	(0.031)	(0.027)	**(0.033)**	(0.024)	**(0.033)**	(0.021)	**(0.026)**	(0.015)	**(0.024)**	(0.019)	**(0.022)**	(0.014)
Dip Before Application	**-0.003**	0.032	**0.013**	0.025	**-0.010**	0.030	**0.019**	0.028	**-0.032**	0.021	**0.003**	0.025
	(0.011)	(0.008)	**(0.009)**	(0.007)	**(0.010)**	(0.007)	**(0.007)**	(0.005)	**(0.008)**	(0.005)	**(0.006)**	(0.004)
Drop at Application	**-0.294**	-0.674	**-0.162**	-0.633	**-0.370**	-0.650	**-0.212**	-0.565	**-0.366**	-0.666	**-0.227**	-0.616
	(0.044)	(0.026)	**(0.037)**	(0.026)	**(0.040)**	(0.026)	**(0.032)**	(0.022)	**(0.031)**	(0.021)	**(0.025)**	(0.019)
Recovery After Application	**-0.002**	-0.004	**0.005**	0.005	**-0.004**	-0.008	**-0.005**	-0.005	**0.000**	-0.008	**-0.001**	-0.008
	(0.006)	(0.003)	**(0.008)**	(0.005)	**(0.005)**	(0.003)	**(0.006)**	(0.004)	**(0.005)**	(0.003)	**(0.005)**	(0.004)
B. Annual Earnings ($1000)												
Baseline Difference vs. Non-Applicants	**-13.340**	-5.195	**-0.952**	2.404	**-20.165**	-9.910	**0.199**	-0.169	**-18.919**	-12.717	**-0.019**	-0.299
	(3.805)	(4.439)	**(1.196)**	(1.304)	**(2.371)**	(2.386)	**(0.821)**	(0.558)	**(2.562)**	(2.482)	**(0.589)**	(0.552)
Dip Before Application	**-5.245**	-4.030	**0.036**	-0.310	**-7.493**	-4.153	**-0.747**	-0.367	**-8.350**	-4.845	**-1.007**	-0.283
	(1.100)	(1.012)	**(0.283)**	(0.355)	**(0.702)**	(0.718)	**(0.220)**	(0.243)	**(0.641)**	(0.670)	**(0.199)**	(0.174)
Drop at Application	**-26.515**	-37.591	**-12.202**	-28.826	**-31.472**	-37.169	**-11.834**	-24.380	**-33.338**	-39.198	**-17.050**	-29.292
	(3.322)	(2.572)	**(1.638)**	(1.915)	**(1.894)**	(1.653)	**(1.035)**	(1.383)	**(1.775)**	(1.561)	**(1.530)**	(1.784)
Recovery After Application	**0.160**	0.004	**0.484**	0.643	**0.122**	-0.009	**-0.306**	-0.010	**0.323**	-0.026	**-0.146**	-0.391
	(0.192)	(0.046)	**(0.336)**	(0.351)	**(0.135)**	(0.047)	**(0.203)**	(0.262)	**(0.187)**	(0.054)	**(0.289)**	(0.351)

Notes: Authors' calculations from 1% Files of Social Security administrative data (see text). The sample consists of non-applicants, finally rejected applicants, and applicants that were awarded benefits during the first stages of review (see text). For definitions of baseline, dip, drop, and recovery see equation (2) in the text. The full model includes a quartic in age, and a quartic in average earnings in the four years prior to the base year; in addition, the model includes year effects interacted with ten dummies for earnings class prior to application and twelve industry dummies. Standard errors clustered at the year-earnings class-industry level are in parentheses.

Table 9: Employment and Earnings Differences Before and After Application to SSDI Relative to Non-Applicants, Effects for Initially Allowed Beneficiaries and Rejected Applicants, Men Age 30-44

	Application During 1982-1987				Application During 1987-1992				Application During 1992-1997			
	No Covariates		Full Model		No Covariates		Full Model		No Covariates		Full Model	
	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary
A. Employment												
Baseline Difference vs. Non-Applicants	**0.070** (**0.008**)	0.083 (0.007)	**0.055** (**0.007**)	0.050 (0.007)	**0.036** (**0.006**)	0.066 (0.006)	**0.061** (**0.007**)	0.052 (0.005)	**0.064** (**0.005**)	0.095 (0.005)	**0.068** (**0.005**)	0.049 (0.005)
Dip Before Application	**0.000** (**0.002**)	0.019 (0.002)	**0.016** (**0.002**)	0.028 (0.002)	**-0.007** (**0.002**)	0.016 (0.002)	**0.016** (**0.002**)	0.024 (0.002)	**-0.007** (**0.002**)	0.020 (0.001)	**0.017** (**0.002**)	0.025 (0.002)
Drop at Application	**-0.198** (**0.010**)	-0.606 (0.009)	**-0.098** (**0.008**)	-0.526 (0.011)	**-0.257** (**0.009**)	-0.655 (0.007)	**-0.131** (**0.007**)	-0.567 (0.010)	**-0.203** (**0.007**)	-0.615 (0.007)	**-0.097** (**0.007**)	-0.549 (0.009)
Recovery After Application	**-0.009** (**0.001**)	-0.007 (0.001)	**-0.004** (**0.001**)	-0.001 (0.002)	**0.002** (**0.001**)	-0.004 (0.001)	**0.000** (**0.001**)	-0.004 (0.002)	**-0.005** (**0.001**)	-0.006 (0.001)	**-0.002** (**0.001**)	-0.002 (0.002)
B. Annual Earnings ($1000)												
Baseline Difference vs. Non-Applicants	**-17.295** (**0.708**)	-14.738 (0.761)	**0.230** (**0.230**)	0.565 (0.244)	**-20.936** (**0.578**)	-16.488 (0.646)	**0.018** (**0.141**)	-0.068 (0.152)	**-19.560** (**0.629**)	-13.771 (0.677)	**0.065** (**0.133**)	0.139 (0.185)
Dip Before Application	**-6.528** (**0.207**)	-5.623 (0.222)	**-0.552** (**0.074**)	-0.306 (0.076)	**-7.552** (**0.180**)	-5.601 (0.193)	**-0.982** (**0.074**)	-0.569 (0.080)	**-7.478** (**0.189**)	-5.275 (0.204)	**-0.536** (**0.056**)	-0.136 (0.062)
Drop at Application	**-26.427** (**0.658**)	-34.375 (0.615)	**-12.675** (**0.561**)	-23.310 (0.851)	**-29.310** (**0.535**)	-35.311 (0.488)	**-13.549** (**0.534**)	-23.187 (0.901)	**-27.126** (**0.571**)	-33.164 (0.556)	**-12.380** (**0.604**)	-22.626 (0.995)
Recovery After Application	**0.146** (**0.048**)	-0.020 (0.047)	**-0.226** (**0.105**)	-0.237 (0.156)	**0.528** (**0.052**)	0.056 (0.025)	**-0.267** (**0.099**)	-0.672 (0.167)	**0.405** (**0.047**)	0.037 (0.025)	**-0.159** (**0.117**)	-0.539 (0.212)

Notes: Authors' calculations from 1% Files of Social Security administrative data (see text). The sample consists of non-applicants, finally rejected applicants, and applicants that were awarded benefits during the first stages of review (see text). For definitions of baseline, dip, drop, and recovery see equation (2) in the text. The full model includes a quartic in age, and a quartic in average earnings in the four years prior to the base year; in addition, the model includes year effects interacted with ten dummies for earnings class prior to application and twelve industry dummies. Standard errors clustered at the year-earnings class-industry level are in parentheses.

Table 10: Differences Before and After Application to SSDI Relative to Non-Applicants, Difference for Different Groups of Allowed and Rejected Applicants, Men Age 45-64 at Application within Five Years of Baseline, Interactions Included Jointly

	Employment				Annual Earnings ($1000)			
	Difference at Baseline	Dip Before Application	Drop at Application	Recovery After Application	Difference at Baseline	Dip Before Application	Drop at Application	Recovery After Application
Panel A: 1982-1987								
Main Effect Allowed	0.122	0.051	**-0.481**	0.004	0.37	0.46	**-12.19**	0.12
	(0.021)	(0.006)	**(0.021)**	(0.002)	(1.05)	(0.35)	**(1.17)**	(0.16)
Main Effect Rejected	0.151	0.024	**-0.105**	0.004	1.43	-0.14	**-6.19**	-0.07
	(0.020)	(0.006)	**(0.027)**	(0.004)	(1.04)	(0.33)	**(1.26)**	(0.15)
High Earner Allowed	-0.108	-0.042	**-0.184**	-0.001	2.69	-0.85	**-25.68**	0.05
	(0.018)	(0.006)	**(0.025)**	(0.003)	(0.96)	(0.39)	**(1.49)**	(0.17)
High Earner Rejected	-0.136	-0.021	**-0.006**	-0.003	0.82	-0.23	**-11.95**	-0.19
	(0.020)	(0.006)	**(0.031)**	(0.004)	(0.97)	(0.38)	**(1.85)**	(0.19)
High Education Allowed	0.150	0.020	**0.101**	-0.001	14.50	4.45	**9.63**	0.04
	(0.029)	(0.010)	**(0.039)**	(0.005)	(1.46)	(0.48)	**(1.45)**	(0.12)
High Education Rejected	0.134	0.043	**0.165**	-0.011	12.81	4.69	**9.85**	0.44
	(0.033)	(0.010)	**(0.051)**	(0.008)	(1.48)	(0.53)	**(2.25)**	(0.27)
Manufacturing Allowed	-0.011	-0.003	**0.018**	-0.006	1.37	-0.24	**-1.29**	-0.02
	(0.018)	(0.006)	**(0.028)**	(0.003)	(1.27)	(0.51)	**(1.83)**	(0.18)
Manufacturing Rejected	-0.034	0.001	**-0.003**	0.001	0.48	0.24	**0.67**	0.17
	(0.020)	(0.007)	**(0.033)**	(0.005)	(1.24)	(0.45)	**(1.95)**	(0.19)
Panel B: 1987-1992								
Main Rejected	0.103	0.042	**-0.516**	0.002	-1.36	-0.89	**-12.07**	-0.10
	(0.017)	(0.005)	**(0.015)**	(0.002)	(0.72)	(0.24)	**(0.88)**	(0.09)
Main Allowed	0.112	0.027	**-0.140**	-0.001	-0.45	-0.62	**-6.12**	0.16
	(0.019)	(0.006)	**(0.024)**	(0.003)	(0.71)	(0.24)	**(0.93)**	(0.13)
High Earner Allowed	-0.091	-0.035	**-0.198**	-0.007	2.31	-0.42	**-26.31**	0.01
	(0.015)	(0.005)	**(0.019)**	(0.002)	(0.68)	(0.28)	**(1.08)**	(0.06)
High Earner Rejected	-0.083	-0.026	**-0.089**	0.000	1.92	-0.68	**-16.46**	-0.09
	(0.017)	(0.006)	**(0.030)**	(0.004)	(0.68)	(0.30)	**(1.27)**	(0.18)
High Education Allowed	0.109	0.025	**0.160**	-0.005	14.66	5.36	**11.11**	-0.25
	(0.018)	(0.006)	**(0.026)**	(0.003)	(0.93)	(0.33)	**(1.39)**	(0.10)
High Education Rejected	0.108	0.027	**0.228**	-0.009	16.02	4.56	**14.23**	0.05
	(0.028)	(0.008)	**(0.034)**	(0.006)	(1.10)	(0.38)	**(1.49)**	(0.18)
Manufacturing Allowed	0.029	0.002	**0.009**	0.005	0.53	0.52	**0.96**	-0.02
	(0.015)	(0.005)	**(0.022)**	(0.003)	(1.01)	(0.38)	**(1.40)**	(0.08)
Manufacturing Rejected	-0.014	-0.004	**0.008**	0.006	0.31	-0.23	**0.02**	-0.19
	(0.020)	(0.007)	**(0.031)**	(0.005)	(0.98)	(0.36)	**(1.36)**	(0.15)
Panel C: 1992-1997								
Main Rejected	0.105	0.045	**-0.553**	-0.006	-0.86	-0.02	**-10.37**	-0.19
	(0.019)	(0.005)	**(0.019)**	(0.003)	(0.84)	(0.24)	**(0.99)**	(0.13)
Main Allowed	0.099	0.008	**-0.172**	0.000	-0.86	-0.26	**-7.21**	0.70
	(0.020)	(0.006)	**(0.024)**	(0.004)	(0.73)	(0.23)	**(1.06)**	(0.37)
High Earner Allowed	-0.077	-0.032	**-0.133**	0.000	2.69	-0.08	**-26.29**	0.03
	(0.017)	(0.005)	**(0.022)**	(0.003)	(0.65)	(0.24)	**(1.12)**	(0.10)

High Earner Rejected	-0.098	-0.009	**-0.016**	0.007	4.25	-0.12	**-14.84**	-0.07
	(0.017)	(0.006)	**(0.031)**	(0.005)	(0.64)	(0.26)	**(1.83)**	(0.29)
High Education Allowed	0.096	0.027	**0.186**	-0.008	13.92	3.95	**8.67**	-0.40
	(0.021)	(0.006)	**(0.030)**	(0.004)	(1.48)	(0.32)	**(1.42)**	(0.18)
High Education Rejected	0.146	0.038	**0.171**	-0.007	13.94	3.79	**11.73**	0.26
	(0.023)	(0.007)	**(0.037)**	(0.007)	(1.24)	(0.38)	**(2.04)**	(0.32)
Manufacturing Allowed	-0.038	-0.007	**0.032**	0.002	-3.01	-1.02	**-4.40**	-0.08
	(0.018)	(0.005)	**(0.026)**	(0.004)	(1.24)	(0.42)	**(1.56)**	(0.12)
Manufacturing Rejected	-0.004	-0.003	**-0.003**	-0.002	-3.92	-1.34	**-2.51**	-0.50
	(0.020)	(0.007)	**(0.033)**	(0.005)	(1.20)	(0.41)	**(1.72)**	(0.26)

Notes: Authors' calculations from 1% Files of Social Security administrative data (see text). The sample consists of non-applicants, finally rejected applicants, and applicants that were awarded benefits during the first stages of review (see text). Each panel reports results from a single regression estimated for applicants applying in the respective year-group. Variables included in the model were year-dummies, a quartic in age at the baseline year, a quartic in average annual earnings in the four year prior to the baseline year, a dummy for whether the individual is non-white and classified as a high earner, and dummies for whether the 1-digit industry of the individual's main job prior to application. For applicants, we also include a dummy for high educated. For definitions of baseline, dip, drop, and recovery see equation (2) and (3) in the text. Interactions of the baseline, dip, drop, and recovery variables with services are included in the model but not reported. Standard errors in parentheses are clustered at the individual level.

Table 11: Differences Before and After Application to SSDI Relative to Non-Applicants, Difference for Different Groups of Allowed and Rejected Applicants, Men Age 30-44 at Application within Five Years of Baseline, Interactions Included Jointly

	Employment				Annual Earnings ($1000)			
	Difference at Baseline	Dip Before Application	Drop at Application	Recovery After Application	Difference at Baseline	Dip Before Application	Drop at Application	Recovery After Application
Panel A: 1982-1987								
Main Effect Allowed	0.138	0.046	**-0.469**	0.004	2.16	0.52	**-12.34**	-0.36
	(0.019)	(0.005)	**(0.024)**	(0.003)	(0.88)	(0.31)	**(0.89)**	(0.10)
Main Effect Rejected	0.098	0.030	**-0.057**	-0.011	1.89	0.54	**-5.51**	-0.51
	(0.017)	(0.004)	**(0.021)**	(0.003)	(0.84)	(0.25)	**(0.89)**	(0.11)
High Earner Allowed	-0.115	-0.030	**-0.144**	0.003	0.07	-0.92	**-21.11**	-0.07
	(0.018)	(0.005)	**(0.032)**	(0.004)	(0.94)	(0.38)	**(1.43)**	(0.14)
High Earner Rejected	-0.088	-0.019	**-0.136**	0.017	1.18	-1.00	**-15.54**	0.33
	(0.016)	(0.005)	**(0.029)**	(0.004)	(0.90)	(0.35)	**(1.51)**	(0.16)
High Education Allowed	0.073	0.026	**0.055**	-0.002	10.21	3.65	**6.86**	0.06
	(0.026)	(0.008)	**(0.037)**	(0.004)	(0.97)	(0.39)	**(1.27)**	(0.12)
High Education Rejected	0.113	0.029	**0.095**	0.010	11.27	3.54	**9.64**	0.41
	(0.026)	(0.008)	**(0.034)**	(0.006)	(0.95)	(0.32)	**(1.36)**	(0.18)
Manufacturing Allowed	-0.015	-0.014	**0.027**	-0.010	0.61	0.10	**0.90**	-0.17
	(0.020)	(0.006)	**(0.033)**	(0.004)	(0.89)	(0.34)	**(1.37)**	(0.16)
Manufacturing Rejected	-0.009	-0.012	**0.031**	0.000	0.31	-0.10	**0.17**	0.19
	(0.020)	(0.006)	**(0.029)**	(0.004)	(0.85)	(0.30)	**(1.24)**	(0.13)
Panel B: 1987-1992								
Main Rejected	0.092	0.039	**-0.525**	0.000	2.60	0.29	**-11.13**	-1.08
	(0.013)	(0.004)	**(0.016)**	(0.002)	(0.73)	(0.25)	**(0.81)**	(0.11)
Main Allowed	0.089	0.022	**-0.100**	0.000	3.59	0.40	**-4.20**	-0.75
	(0.013)	(0.004)	**(0.018)**	(0.003)	(0.76)	(0.27)	**(0.89)**	(0.14)
High Earner Allowed	-0.069	-0.034	**-0.151**	-0.001	-1.92	-1.49	**-24.55**	0.33
	(0.012)	(0.004)	**(0.021)**	(0.003)	(0.82)	(0.35)	**(1.20)**	(0.11)
High Earner Rejected	-0.054	-0.022	**-0.096**	0.006	-1.26	-2.51	**-19.34**	0.70
	(0.012)	(0.004)	**(0.025)**	(0.004)	(1.07)	(0.42)	**(1.45)**	(0.24)
High Education Allowed	0.109	0.027	**0.133**	-0.006	10.39	3.95	**9.74**	0.10
	(0.019)	(0.006)	**(0.026)**	(0.003)	(0.90)	(0.30)	**(1.10)**	(0.18)
High Education Rejected	0.093	0.031	**0.140**	-0.001	11.30	4.03	**12.71**	0.54
	(0.022)	(0.007)	**(0.029)**	(0.005)	(0.83)	(0.30)	**(1.17)**	(0.33)
Manufacturing Allowed	-0.008	-0.008	**-0.001**	-0.002	0.23	0.07	**0.41**	-0.12
	(0.015)	(0.005)	**(0.024)**	(0.003)	(0.85)	(0.34)	**(1.20)**	(0.12)
Manufacturing Rejected	-0.023	-0.002	**0.003**	0.005	-0.84	0.09	**-0.52**	-0.03
	(0.016)	(0.005)	**(0.026)**	(0.004)	(0.78)	(0.29)	**(1.08)**	(0.15)
Panel C: 1992-1997								
Main Rejected	0.125	0.032	**-0.520**	0.003	1.44	0.06	**-13.14**	-0.62
	(0.011)	(0.003)	**(0.014)**	(0.002)	(0.50)	(0.15)	**(0.60)**	(0.08)
Main Allowed	0.117	0.016	**-0.086**	0.001	2.07	0.02	**-6.27**	-0.36
	(0.010)	(0.003)	**(0.014)**	(0.002)	(0.45)	(0.14)	**(0.57)**	(0.09)
High Earner Allowed	-0.092	-0.021	**-0.145**	-0.004	-1.06	-0.91	**-23.53**	-0.03
	(0.010)	(0.003)	**(0.019)**	(0.003)	(0.53)	(0.20)	**(0.95)**	(0.10)

High Earner Rejected	-0.089	-0.019	**-0.084**	0.000	-0.97	-1.45	**-16.49**	0.35
	(0.009)	(0.003)	**(0.019)**	(0.003)	(0.52)	(0.21)	**(0.95)**	(0.14)
High Education Allowed	0.037	0.013	**0.137**	-0.003	9.73	3.65	**7.62**	-0.02
	(0.017)	(0.005)	**(0.024)**	(0.004)	(0.74)	(0.26)	**(1.01)**	(0.15)
High Education Rejected	0.068	0.033	**0.115**	0.002	10.27	3.74	**9.57**	0.40
	(0.016)	(0.005)	**(0.022)**	(0.004)	(0.81)	(0.28)	**(1.08)**	(0.17)
Manufacturing Allowed	-0.032	-0.002	**0.016**	-0.003	0.62	0.62	**0.31**	-0.11
	(0.013)	(0.004)	**(0.022)**	(0.003)	(0.67)	(0.24)	**(0.97)**	(0.09)
Manufacturing Rejected	-0.013	0.000	**0.022**	-0.005	0.23	0.13	**-0.44**	-0.12
	(0.012)	(0.004)	**(0.019)**	(0.003)	(0.62)	(0.22)	**(0.83)**	(0.10)

Notes: Authors' calculations from 1% Files of Social Security administrative data (see text). The sample consists of non-applicants, finally rejected applicants, and applicants that were awarded benefits during the first stages of review (see text). Each panel reports results from a single regression estimated for applicants applying in the respective year-group. Variables included in the model were year-dummies, a quartic in age at the baseline year, a quartic in average annual earnings in the four year prior to the baseline year, a dummy for whether the individual is non-white and classified as a high earner, and dummies for whether the 1-digit industry of the individual's main job prior to application. For applicants, we also include a dummy for high educated. For definitions of baseline, dip, drop, and recovery see equation (2) and (3) in the text. Interactions of the baseline, dip, drop, and recovery variables with services are included in the model but not reported. Standard errors in parentheses are clustered at the individual level.

Appendix Table 1: Employment and Earnings Differences Before and After Application to SSDI Relative to Non-Applicants, Effects for Initially Allowed Beneficiaries and Rejected Applicants, Women Age 45-64

| | Application During 1982-1987 | | | | Application During 1987-1992 | | | | Application During 1992-1997 | | | |
| | No Covariates | | Full Model | | No Covariates | | Full Model | | No Covariates | | Full Model | |
	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary	Finally Rejected	Initially Allowed Beneficiary
A. Employment												
Baseline Difference vs. Non-Applicants	**0.114** (0.043)	0.129 (0.039)	**0.034** (0.042)	0.046 (0.042)	**0.133** (0.032)	0.133 (0.026)	**0.060** (0.028)	0.019 (0.018)	**0.050** (0.030)	0.111 (0.019)	**0.022** (0.027)	0.031 (0.013)
Dip Before Application	**0.005** (0.014)	0.054 (0.009)	**-0.002** (0.011)	0.025 (0.009)	**0.021** (0.010)	0.049 (0.007)	**0.005** (0.009)	0.025 (0.006)	**-0.005** (0.008)	0.031 (0.005)	**0.006** (0.007)	0.021 (0.005)
Drop at Application	**-0.242** (0.054)	-0.552 (0.047)	**-0.164** (0.038)	-0.559 (0.034)	**-0.208** (0.045)	-0.561 (0.033)	**-0.177** (0.032)	-0.565 (0.025)	**-0.190** (0.035)	-0.615 (0.026)	**-0.109** (0.027)	-0.597 (0.020)
Recovery After Application	**-0.007** (0.008)	-0.008 (0.005)	**-0.009** (0.008)	0.002 (0.007)	**-0.003** (0.006)	-0.009 (0.004)	**0.002** (0.006)	-0.003 (0.005)	**0.001** (0.006)	-0.003 (0.004)	**0.005** (0.006)	0.004 (0.004)
B. Annual Earnings ($1000)												
Baseline Difference vs. Non-Applicants	**-3.469** (1.842)	-2.747 (1.661)	**0.242** (0.722)	-0.444 (0.616)	**-4.265** (1.731)	-2.572 (1.613)	**1.305** (1.077)	0.879 (0.598)	**-9.116** (1.391)	-3.789 (1.381)	**0.254** (0.414)	-0.393 (0.299)
Dip Before Application	**-1.109** (0.489)	-0.376 (0.495)	**0.095** (0.217)	0.027 (0.176)	**-1.882** (0.505)	-1.245 (0.461)	**-0.630** (0.236)	-0.302 (0.170)	**-3.585** (0.383)	-1.267 (0.417)	**-0.242** (0.129)	0.134 (0.127)
Drop at Application	**-9.286** (1.486)	-13.825 (1.020)	**-6.087** (0.880)	-11.739 (1.003)	**-12.989** (1.354)	-18.123 (1.045)	**-10.215** (0.973)	-16.513 (1.049)	**-14.871** (1.131)	-21.308 (0.816)	**-8.491** (0.848)	-19.787 (1.160)
Recovery After Application	**0.203** (0.171)	-0.045 (0.040)	**0.127** (0.168)	0.008 (0.192)	**0.283** (0.133)	0.009 (0.049)	**0.247** (0.240)	-0.120 (0.212)	**0.328** (0.146)	0.116 (0.068)	**0.000** (0.194)	-0.270 (0.301)

Notes: Authors' calculations from 1% Files of Social Security administrative data (see text). The sample consists of non-applicants, finally rejected applicants, and applicants that were awarded benefits during the first stages of review (see text). For definitions of baseline, dip, drop, and recovery see equation (2) in the text. The full model includes a quartic in age, and a quartic in average earnings in the four years prior to the base year; in addition, the model includes year effects interacted with ten dummies for earnings class prior to application and twelve industry dummies. Standard errors clustered at the year-earnings class-industry level are in parentheses.

Appendix Table 2: Employment and Earnings Differences Before and After Application to SSDI Relative to Non-Applicants, Effects for Initially Allowed Beneficiaries and Rejected Applicants, Women Age 30-44

	Application During 1982-1986				Application During 1987-1992				Application During 1992-1997			
	No Covariates		Full Model		No Covariates		Full Model		No Covariates		Full Model	
	Finally Rejected	Allowed Benefici	Finally Rejected	Allowed Benefici	Finally Rejected	Allowed Benefici	Finally Rejected	Allowed Benefici	Finally Rejected	Allowed Benefici	Finally Rejected	Allowed Benefici
A. Employment												
Baseline Difference Relative to Non-Applicants	**0.067**	0.076	**0.057**	0.034	**0.052**	0.068	**0.050**	0.039	**0.063**	0.096	**0.053**	0.029
	(0.011)	(0.011)	**(0.009)**	(0.008)	**(0.008)**	(0.007)	**(0.007)**	(0.006)	**(0.006)**	(0.006)	**(0.007)**	(0.004)
Dip Before Application	**0.009**	0.030	**0.014**	0.021	**0.012**	0.025	**0.015**	0.021	**0.006**	0.028	**0.017**	0.021
	(0.003)	(0.003)	**(0.002)**	(0.003)	**(0.002)**	(0.002)	**(0.002)**	(0.002)	**(0.002)**	(0.002)	**(0.002)**	(0.002)
Drop at Application	**-0.182**	-0.548	**-0.149**	-0.558	**-0.192**	-0.569	**-0.146**	-0.544	**-0.172**	-0.572	**-0.118**	-0.553
	(0.013)	(0.013)	**(0.010)**	(0.010)	**(0.011)**	(0.009)	**(0.008)**	(0.009)	**(0.008)**	(0.008)	**(0.006)**	(0.009)
Recovery After Application	**-0.003**	-0.004	**-0.003**	-0.003	**0.003**	-0.003	**0.002**	-0.003	**0.000**	-0.003	**0.001**	-0.002
	(0.002)	(0.002)	**(0.002)**	(0.002)	**(0.002)**	(0.001)	**(0.002)**	(0.002)	**(0.001)**	(0.001)	**(0.001)**	(0.002)
B. Annual Earnings ($1000)												
Baseline Difference Relative to Non-Applicants	**-7.022**	-4.561	**0.046**	0.013	**-8.761**	-6.447	**0.016**	0.073	**-9.789**	-4.794	**0.037**	-0.014
	(0.423)	(0.496)	**(0.148)**	(0.165)	**(0.383)**	(0.410)	**(0.109)**	(0.119)	**(0.334)**	(0.411)	**(0.081)**	(0.101)
Dip Before Application	**-2.226**	-1.508	**-0.189**	-0.213	**-2.666**	-1.873	**-0.382**	-0.219	**-3.407**	-1.811	**-0.225**	-0.011
	(0.123)	(0.136)	**(0.062)**	(0.060)	**(0.117)**	(0.122)	**(0.050)**	(0.055)	**(0.098)**	(0.114)	**(0.039)**	(0.040)
Drop at Application	**-11.158**	-15.754	**-8.128**	-15.202	**-13.492**	-18.844	**-9.092**	-16.262	**-14.216**	-19.383	**-8.402**	-16.759
	(0.362)	(0.308)	**(0.353)**	(0.602)	**(0.323)**	(0.232)	**(0.335)**	(0.679)	**(0.281)**	(0.244)	**(0.379)**	(0.762)
Recovery After Application	**0.256**	-0.012	**-0.104**	-0.307	**0.469**	0.053	**-0.107**	-0.450	**0.464**	0.099	**-0.103**	-0.378
	(0.045)	(0.035)	**(0.066)**	(0.107)	**(0.040)**	(0.024)	**(0.064)**	(0.127)	**(0.035)**	(0.025)	**(0.074)**	(0.157)

Notes: Authors' calculations from 1% Files of Social Security administrative data (see text). The sample consists of non-applicants, finally rejected applicants, and applicants that were awarded benefits during the first stages of review (see text). For definitions of baseline, dip, drop, and recovery see equation (2) in the text. The full model includes a quartic in age, and a quartic in average earnings in the four years prior to the base year; in addition, the model includes year effects interacted with ten dummies for earnings class prior to application and twelve industry dummies. Standard errors clustered at the year-earnings class-industry level are in parentheses.

Main Allowed	0.164	-0.006	**-0.062**	0.009	-4.953	-1.457	**2.548**	1.033
	(0.076)	(0.019)	**(0.070)**	(0.014)	(2.001)	(0.466)	**(1.698)**	(0.391)
High Earner Allowed	-0.003	-0.014	**-0.125**	0.010	17.414	4.278	**-16.108**	0.104
	(0.045)	(0.011)	**(0.041)**	(0.006)	(1.638)	(0.447)	**(1.273)**	(0.116)
High Earner Rejected	-0.051	0.019	**0.005**	0.008	16.693	3.953	**-4.363**	0.380
	(0.049)	(0.015)	**(0.071)**	(0.014)	(1.948)	(0.518)	**(2.185)**	(0.565)
High Education Allowed	-0.077	-0.031	**0.000**	-0.014	0.460	0.888	**-4.567**	-0.347
	(0.064)	(0.014)	**(0.060)**	(0.009)	(2.281)	(0.748)	**(2.823)**	(0.245)
High Education Rejected	-0.017	-0.006	**0.158**	-0.021	0.953	-0.504	**-1.250**	0.079
	(0.061)	(0.017)	**(0.075)**	(0.017)	(2.523)	(0.650)	**(2.477)**	(0.775)
Manufacturing Allowed	-0.095	-0.030	**-0.073**	0.006	-4.343	-0.127	**-1.829**	-0.231
	(0.046)	(0.013)	**(0.049)**	(0.007)	(1.887)	(0.526)	**(1.297)**	(0.162)
Manufacturing Rejected	-0.093	-0.007	**-0.002**	-0.003	2.389	0.640	**0.355**	-0.875
	(0.055)	(0.018)	**(0.076)**	(0.015)	(2.215)	(0.577)	**(2.505)**	(0.456)
Muscuskeletal Rejected	-0.024	0.029	**0.032**	-0.005	3.660	1.627	**-1.441**	0.101
	(0.098)	(0.023)	**(0.097)**	(0.011)	(3.870)	(0.933)	**(2.173)**	(0.228)
Circulatory Allowed	0.073	0.042	**0.014**	0.001	3.450	1.539	**1.012**	-0.495
	(0.078)	(0.023)	**(0.081)**	(0.013)	(1.871)	(0.533)	**(2.149)**	(0.301)
Circulatory Rejected	0.052	0.007	**-0.010**	-0.002	1.139	-1.137	**-1.062**	-0.133
	(0.068)	(0.021)	**(0.072)**	(0.010)	(2.995)	(0.687)	**(1.764)**	(0.164)
Mental Health Allowed	0.095	0.039	**0.017**	0.012	-2.231	0.543	**1.843**	0.958
	(0.074)	(0.029)	**(0.096)**	(0.017)	(3.484)	(0.616)	**(2.808)**	(1.355)
Mental Health Rejected	-0.021	-0.014	**0.052**	-0.005	3.005	-0.198	**0.786**	-0.015
	(0.051)	(0.015)	**(0.062)**	(0.009)	(1.983)	(0.557)	**(1.478)**	(0.167)
Injuries Allowed	-0.047	0.008	**-0.041**	0.027	6.980	1.350	**0.138**	0.276
	(0.080)	(0.021)	**(0.085)**	(0.015)	(2.526)	(0.626)	**(2.378)**	(0.424)
Injuries Rejected	-0.182	0.016	**0.238**	-0.016	3.361	1.983	**1.837**	-0.428
	(0.144)	(0.023)	**(0.166)**	(0.030)	(3.062)	(1.171)	**(2.308)**	(0.254)
Neoplasms Allowed	0.038	0.009	**0.009**	0.020	4.108	1.076	**1.348**	0.329
	(0.081)	(0.023)	**(0.093)**	(0.016)	(2.544)	(0.511)	**(2.194)**	(0.504)
Neoplasms Rejected	-0.100	-0.007	**-0.160**	0.001	-0.230	0.484	**-6.545**	-0.042
	(0.062)	(0.015)	**(0.059)**	(0.007)	(2.227)	(0.669)	**(3.145)**	(0.198)

Notes: Authors' calculations from 1% Files of Social Security administrative data (see text). The sample consists of non-applicants, finally rejected applicants, and applicants that were awarded benefits during the first stages of review (see text). Each panel reports results from a single regression estimated for applicants applying in the respective year-group. Variables included in the model were year-dummies, a quartic in age at the baseline year, a quartic in average annual earnings in the four year prior to the baseline year, a dummy for whether the individual is non-white and classified as a high earner, and dummies for whether the 1-digit industry of the individual's main job prior to application. For applicants, we also include a dummy for high educated and 16 dummies for major impairment code. For definitions of baseline, dip, drop, and recovery see equation (2) and (3) in the text. Interactions of the baseline, dip, drop, and recovery variables with services are included in the model but not reported. Standard errors in parentheses are clustered at the individual level.

Appendix Table 3: Differences Before and After Application to SSDI Relative to Non-Applicants, Difference for Alternative Groups of Allowed and Rejected Applicants Including Impairment Groups, Men Age 45-64 at Application within Five Years of Baseline, Interactions Included Jointly

	Employment				Annual Earnings ($1000)			
	Difference at Baseline	Dip Before Application	Drop at Application	Recovery After Application	Difference at Baseline	Dip Before Application	Drop at Application	Recovery After Application
Panel A: 1987-1992								
Main Allowed	0.129	0.084	**-0.351**	0.011	-4.518	-0.062	**1.480**	0.341
	(0.055)	(0.017)	**(0.054)**	(0.011)	(1.959)	(0.536)	**(1.754)**	(0.361)
Main Rejected	0.154	0.071	**-0.096**	0.001	-4.215	-0.774	**4.023**	0.098
	(0.096)	(0.025)	**(0.080)**	(0.017)	(1.961)	(0.525)	**(2.208)**	(0.437)
High Earner Allowed	0.013	-0.015	**-0.147**	-0.013	13.993	3.450	**-15.752**	-0.372
	(0.052)	(0.015)	**(0.059)**	(0.007)	(2.208)	(0.613)	**(1.992)**	(0.146)
High Earner Rejected	-0.052	-0.025	**-0.011**	0.016	11.631	2.996	**-4.887**	0.276
	(0.068)	(0.019)	**(0.089)**	(0.014)	(2.070)	(0.696)	**(2.824)**	(0.316)
High Education Allowed	-0.050	-0.021	**0.033**	0.009	3.019	1.195	**-2.159**	0.256
High Education Allowed	(0.057)	(0.017)	**(0.084)**	(0.010)	(2.744)	(0.960)	**(3.628)**	(0.216)
High Education Rejected	-0.050	-0.028	**0.147**	-0.014	2.713	-0.756	**-1.038**	0.013
	(0.065)	(0.028)	**(0.100)**	(0.023)	(2.159)	(0.984)	**(4.054)**	(0.523)
Manufacturing Allowed	-0.041	-0.005	**-0.006**	0.005	0.620	-0.677	**0.226**	0.265
	(0.052)	(0.014)	**(0.072)**	(0.008)	(2.344)	(0.721)	**(2.512)**	(0.151)
Manufacturing Rejected	-0.017	-0.016	**0.025**	-0.007	3.355	-0.034	**2.306**	-0.722
	(0.071)	(0.020)	**(0.084)**	(0.015)	(2.122)	(0.670)	**(2.587)**	(0.325)
Musculoskeletal Allowed	0.017	-0.025	**0.152**	-0.004	4.665	0.683	**0.919**	0.087
	(0.068)	(0.031)	**(0.107)**	(0.017)	(2.842)	(1.036)	**(2.187)**	(0.291)
Musculoskeletal Rejected	-0.020	-0.016	**0.083**	0.010	2.366	1.102	**-0.775**	0.631
	(0.102)	(0.026)	**(0.090)**	(0.016)	(2.320)	(0.690)	**(2.493)**	(0.287)
Circulatory Allowed	-0.053	-0.020	**0.024**	-0.002	0.684	0.259	**-0.282**	-0.081
	(0.069)	(0.021)	**(0.080)**	(0.006)	(1.984)	(0.715)	**(2.169)**	(0.110)
Circulatory Rejected	0.035	-0.059	**0.187**	-0.020	-3.050	-0.714	**1.551**	0.200
	(0.132)	(0.047)	**(0.161)**	(0.023)	(2.699)	(0.990)	**(2.965)**	(0.475)
Mental Health Allowed	-0.054	-0.023	**0.126**	-0.008	0.162	0.042	**0.949**	-0.141
	(0.062)	(0.019)	**(0.074)**	(0.008)	(2.139)	(0.675)	**(2.508)**	(0.157)
Mental Health Rejected	-0.017	-0.027	**-0.045**	-0.002	-0.404	0.639	**-2.207**	-0.188
	(0.100)	(0.031)	**(0.118)**	(0.018)	(2.520)	(0.772)	**(3.365)**	(0.456)
Injuries Allowed	0.148	0.013	**0.071**	-0.001	1.336	0.375	**2.556**	0.038
	(0.089)	(0.025)	**(0.123)**	(0.012)	(2.725)	(0.897)	**(2.489)**	(0.179)
Injuries Rejected	-0.048	0.002	**0.215**	-0.026	1.735	1.182	**2.595**	0.065
	(0.123)	(0.032)	**(0.112)**	(0.017)	(2.416)	(0.930)	**(2.750)**	(0.353)
Neoplasms Allowed	-0.202	-0.047	**-0.018**	-0.013	-1.953	1.030	**-4.925**	-0.138
	(0.065)	(0.018)	**(0.066)**	(0.009)	(3.517)	(0.856)	**(3.085)**	(0.155)
Neoplasms Rejected	-0.112	-0.039	**0.478**	-0.011	-4.697	-1.507	**2.344**	0.667
	(0.163)	(0.052)	**(0.229)**	(0.046)	(3.317)	(1.398)	**(3.911)**	(0.797)
Panel B: 1992-1997								
Main Rejected	0.174	0.084	**-0.271**	0.004	-4.219	0.036	**2.812**	0.405
	(0.053)	(0.016)	**(0.058)**	(0.011)	(1.727)	(0.582)	**(2.147)**	(0.298)

Main Allowed	0.164	-0.006	**-0.062**	0.009	-4.953	-1.457	**2.548**	1.033
	(0.076)	(0.019)	**(0.070)**	(0.014)	(2.001)	(0.466)	**(1.698)**	(0.391)
High Earner Allowed	-0.003	-0.014	**-0.125**	0.010	17.414	4.278	**-16.108**	0.104
	(0.045)	(0.011)	**(0.041)**	(0.006)	(1.638)	(0.447)	**(1.273)**	(0.116)
High Earner Rejected	-0.051	0.019	**0.005**	0.008	16.693	3.953	**-4.363**	0.380
	(0.049)	(0.015)	**(0.071)**	(0.014)	(1.948)	(0.518)	**(2.185)**	(0.565)
High Education Allowed	-0.077	-0.031	**0.000**	-0.014	0.460	0.888	**-4.567**	-0.347
	(0.064)	(0.014)	**(0.060)**	(0.009)	(2.281)	(0.748)	**(2.823)**	(0.245)
High Education Rejected	-0.017	-0.006	**0.158**	-0.021	0.953	-0.504	**-1.250**	0.079
	(0.061)	(0.017)	**(0.075)**	(0.017)	(2.523)	(0.650)	**(2.477)**	(0.775)
Manufacturing Allowed	-0.095	-0.030	**-0.073**	0.006	-4.343	-0.127	**-1.829**	-0.231
	(0.046)	(0.013)	**(0.049)**	(0.007)	(1.887)	(0.526)	**(1.297)**	(0.162)
Manufacturing Rejected	-0.093	-0.007	**-0.002**	-0.003	2.389	0.640	**0.355**	-0.875
	(0.055)	(0.018)	**(0.076)**	(0.015)	(2.215)	(0.577)	**(2.505)**	(0.456)
Muscuskeletal Rejected	-0.024	0.029	**0.032**	-0.005	3.660	1.627	**-1.441**	0.101
	(0.098)	(0.023)	**(0.097)**	(0.011)	(3.870)	(0.933)	**(2.173)**	(0.228)
Circulatory Allowed	0.073	0.042	**0.014**	0.001	3.450	1.539	**1.012**	-0.495
	(0.078)	(0.023)	**(0.081)**	(0.013)	(1.871)	(0.533)	**(2.149)**	(0.301)
Circulatory Rejected	0.052	0.007	**-0.010**	-0.002	1.139	-1.137	**-1.062**	-0.133
	(0.068)	(0.021)	**(0.072)**	(0.010)	(2.995)	(0.687)	**(1.764)**	(0.164)
Mental Health Allowed	0.095	0.039	**0.017**	0.012	-2.231	0.543	**1.843**	0.958
	(0.074)	(0.029)	**(0.096)**	(0.017)	(3.484)	(0.616)	**(2.808)**	(1.355)
Mental Health Rejected	-0.021	-0.014	**0.052**	-0.005	3.005	-0.198	**0.786**	-0.015
	(0.051)	(0.015)	**(0.062)**	(0.009)	(1.983)	(0.557)	**(1.478)**	(0.167)
Injuries Allowed	-0.047	0.008	**-0.041**	0.027	6.980	1.350	**0.138**	0.276
	(0.080)	(0.021)	**(0.085)**	(0.015)	(2.526)	(0.626)	**(2.378)**	(0.424)
Injuries Rejected	-0.182	0.016	**0.238**	-0.016	3.361	1.983	**1.837**	-0.428
	(0.144)	(0.023)	**(0.166)**	(0.030)	(3.062)	(1.171)	**(2.308)**	(0.254)
Neoplasms Allowed	0.038	0.009	**0.009**	0.020	4.108	1.076	**1.348**	0.329
	(0.081)	(0.023)	**(0.093)**	(0.016)	(2.544)	(0.511)	**(2.194)**	(0.504)
Neoplasms Rejected	-0.100	-0.007	**-0.160**	0.001	-0.230	0.484	**-6.545**	-0.042
	(0.062)	(0.015)	**(0.059)**	(0.007)	(2.227)	(0.669)	**(3.145)**	(0.198)

Notes: Authors' calculations from 1% Files of Social Security administrative data (see text). The sample consists of non-applicants, finally rejected applicants, and applicants that were awarded benefits during the first stages of review (see text). Each panel reports results from a single regression estimated for applicants applying in the respective year-group. Variables included in the model were year-dummies, a quartic in age at the baseline year, a quartic in average annual earnings in the four year prior to the baseline year, a dummy for whether the individual is non-white and classified as a high earner, and dummies for whether the 1-digit industry of the individual's main job prior to application. For applicants, we also include a dummy for high educated and 16 dummies for major impairment code. For definitions of baseline, dip, drop, and recovery see equation (2) and (3) in the text. Interactions of the baseline, dip, drop, and recovery variables with services are included in the model but not reported. Standard errors in parentheses are clustered at the individual level.

Appendix Table 4: Differences Before and After Application to SSDI Relative to Non-Applicants, Difference for Alternative Groups of Allowed and Rejected Applicants Including Impairment Groups, Men Age 45-64 at Application within Five Years of Baseline, Interactions Included Jointly

	Employment				Annual Earnings ($1000)			
	Difference at Baseline	Dip Before Application	Drop at Application	Recovery After Application	Difference at Baseline	Dip Before Application	Drop at Application	Recovery After Application
Panel A: 1987-1992								
Main Allowed	0.124	0.060	**-0.373**	0.001	-1.093	0.636	**-0.985**	0.310
	(0.016)	(0.004)	**(0.016)**	(0.003)	(0.530)	(0.144)	**(0.481)**	(0.105)
Main Rejected	0.099	0.026	**0.017**	0.005	-1.961	-0.172	**2.902**	0.672
	(0.019)	(0.005)	**(0.022)**	(0.004)	(0.483)	(0.167)	**(0.516)**	(0.142)
High Earner Allowed	-0.001	-0.008	**-0.081**	-0.004	14.152	3.533	**-11.638**	0.101
	(0.012)	(0.003)	**(0.014)**	(0.002)	(0.534)	(0.160)	**(0.468)**	(0.061)
High Earner Rejected	-0.001	-0.001	**-0.029**	0.001	13.371	2.902	**-3.949**	0.274
	(0.012)	(0.004)	**(0.018)**	(0.003)	(0.455)	(0.179)	**(0.674)**	(0.158)
High Education Allowed	-0.003	-0.012	**0.048**	-0.006	1.220	0.746	**-0.920**	0.016
High Education Allowed	(0.014)	(0.004)	**(0.018)**	(0.002)	(0.716)	(0.200)	**(0.728)**	(0.109)
High Education Rejected	-0.021	-0.011	**0.045**	-0.002	0.318	-0.128	**-0.174**	0.433
	(0.018)	(0.005)	**(0.022)**	(0.004)	(0.601)	(0.201)	**(0.744)**	(0.216)
Manufacturing Allowed	0.008	-0.005	**-0.012**	0.001	-0.049	0.310	**0.259**	-0.079
	(0.014)	(0.004)	**(0.017)**	(0.002)	(0.488)	(0.167)	**(0.529)**	(0.071)
Manufacturing Rejected	-0.025	-0.004	**0.001**	0.006	-0.235	0.131	**0.126**	-0.050
	(0.015)	(0.004)	**(0.018)**	(0.003)	(0.430)	(0.144)	**(0.544)**	(0.112)
Musculoskeletal Allowed	-0.034	-0.012	**0.109**	0.003	0.787	0.468	**1.497**	0.078
	(0.024)	(0.007)	**(0.030)**	(0.004)	(0.855)	(0.393)	**(0.977)**	(0.117)
Musculoskeletal Rejected	0.032	0.020	**0.088**	0.008	1.687	0.797	**2.047**	0.218
	(0.020)	(0.006)	**(0.024)**	(0.004)	(0.525)	(0.181)	**(0.557)**	(0.103)
Circulatory Allowed	-0.036	-0.010	**0.028**	0.002	-0.649	-0.285	**0.218**	0.139
	(0.023)	(0.006)	**(0.025)**	(0.003)	(0.897)	(0.234)	**(0.739)**	(0.069)
Circulatory Rejected	-0.043	0.012	**0.098**	-0.017	0.227	0.477	**1.953**	-0.211
	(0.033)	(0.008)	**(0.037)**	(0.006)	(0.839)	(0.278)	**(1.051)**	(0.165)
Mental Health Allowed	-0.010	-0.005	**0.116**	0.005	0.639	-0.255	**1.390**	0.166
	(0.016)	(0.004)	**(0.017)**	(0.002)	(0.530)	(0.152)	**(0.444)**	(0.069)
Mental Health Rejected	-0.012	0.004	**0.065**	-0.010	1.267	0.120	**1.676**	-0.057
	(0.022)	(0.006)	**(0.026)**	(0.004)	(0.525)	(0.186)	**(0.596)**	(0.143)
Injuries Allowed	-0.040	-0.012	**0.080**	0.008	0.128	-0.304	**2.170**	0.402
	(0.025)	(0.008)	**(0.033)**	(0.004)	(0.946)	(0.316)	**(0.870)**	(0.156)
Injuries Rejected	0.013	0.018	**0.114**	0.001	1.623	0.685	**2.675**	0.275
	(0.023)	(0.006)	**(0.026)**	(0.004)	(0.591)	(0.196)	**(0.658)**	(0.200)
Neoplasms Allowed	-0.054	0.000	**-0.054**	0.005	-1.674	0.216	**-3.403**	0.117
	(0.023)	(0.006)	**(0.020)**	(0.002)	(0.923)	(0.253)	**(1.186)**	(0.089)
Neoplasms Rejected	-0.063	0.018	**0.092**	-0.019	-0.756	-0.029	**3.070**	0.012
	(0.082)	(0.013)	**(0.090)**	(0.014)	(1.905)	(0.501)	**(3.290)**	(0.590)
Panel B: 1992-1997								
Main Rejected	0.149	0.066	**-0.391**	0.007	-1.522	0.486	**-1.442**	0.213
	(0.014)	(0.004)	**(0.016)**	(0.003)	(0.562)	(0.141)	**(0.412)**	(0.090)

Main Allowed	0.111	0.031	**0.039**	0.008	-1.645	-0.031	**2.694**	0.693
	(0.015)	(0.004)	**(0.017)**	(0.004)	(0.380)	(0.109)	**(0.431)**	(0.141)
High Earner Allowed	-0.049	-0.010	**-0.080**	-0.004	12.170	3.564	**-11.269**	-0.078
	(0.011)	(0.003)	**(0.015)**	(0.002)	(0.461)	(0.143)	**(0.459)**	(0.065)
High Earner Rejected	-0.062	-0.008	**-0.039**	0.001	12.245	2.922	**-3.683**	0.090
	(0.010)	(0.003)	**(0.016)**	(0.003)	(0.492)	(0.148)	**(0.687)**	(0.130)
High Education Allowed	-0.049	-0.014	**0.055**	-0.003	1.159	0.550	**-1.735**	-0.104
	(0.013)	(0.004)	**(0.019)**	(0.003)	(0.768)	(0.209)	**(0.643)**	(0.092)
High Education Rejected	-0.017	0.001	**0.019**	0.002	0.386	0.189	**-0.455**	0.257
	(0.014)	(0.004)	**(0.019)**	(0.004)	(0.689)	(0.185)	**(0.744)**	(0.146)
Manufacturing Allowed	-0.041	-0.004	**0.009**	-0.003	0.362	0.405	**-0.363**	-0.144
	(0.013)	(0.004)	**(0.018)**	(0.003)	(0.557)	(0.134)	**(0.497)**	(0.072)
Manufacturing Rejected	-0.019	-0.005	**0.006**	-0.004	0.482	0.132	**0.319**	-0.196
	(0.013)	(0.004)	**(0.016)**	(0.003)	(0.446)	(0.108)	**(0.477)**	(0.097)
Muscuskeletal Rejected	-0.008	-0.008	**0.022**	0.010	1.931	0.059	**0.202**	0.341
	(0.020)	(0.006)	**(0.030)**	(0.005)	(0.716)	(0.225)	**(0.774)**	(0.126)
Circulatory Allowed	0.023	0.013	**0.034**	0.010	1.225	0.499	**2.054**	0.299
	(0.016)	(0.004)	**(0.018)**	(0.003)	(0.446)	(0.125)	**(0.469)**	(0.105)
Circulatory Rejected	-0.041	-0.008	**0.009**	-0.002	-0.619	-0.136	**-1.849**	0.132
	(0.020)	(0.006)	**(0.028)**	(0.004)	(0.941)	(0.228)	**(0.776)**	(0.111)
Mental Health Allowed	-0.010	-0.009	**-0.045**	0.008	-1.100	-0.101	**-0.758**	0.251
	(0.026)	(0.007)	**(0.033)**	(0.006)	(0.636)	(0.226)	**(0.902)**	(0.180)
Mental Health Rejected	-0.016	-0.017	**0.084**	0.008	1.417	-0.068	**0.640**	0.256
	(0.013)	(0.004)	**(0.017)**	(0.003)	(0.508)	(0.151)	**(0.450)**	(0.064)
Injuries Allowed	0.027	0.005	**0.054**	-0.001	1.379	0.132	**1.583**	-0.124
	(0.016)	(0.004)	**(0.019)**	(0.003)	(0.488)	(0.130)	**(0.564)**	(0.101)
Injuries Rejected	-0.019	-0.020	**0.047**	0.012	0.200	-0.476	**1.049**	0.370
	(0.020)	(0.007)	**(0.035)**	(0.005)	(0.690)	(0.223)	**(0.945)**	(0.141)
Neoplasms Allowed	0.023	0.009	**0.069**	0.004	-0.189	0.358	**2.694**	0.182
	(0.019)	(0.005)	**(0.022)**	(0.004)	(0.527)	(0.144)	**(0.644)**	(0.229)
Neoplasms Rejected	-0.047	-0.001	**-0.103**	0.008	-0.856	-0.083	**-3.202**	0.187
	(0.020)	(0.005)	**(0.020)**	(0.003)	(0.833)	(0.194)	**(0.736)**	(0.093)

Notes: Authors' calculations from 1% Files of Social Security administrative data (see text). The sample consists of non-applicants, finally rejected applicants, and applicants that were awarded benefits during the first stages of review (see text). Each panel reports results from a single regression estimated for applicants applying in the respective year-group. Variables included in the model were year-dummies, a quartic in age at the baseline year, a quartic in average annual earnings in the four year prior to the baseline year, a dummy for whether the individual is non-white and classified as a high earner, and dummies for whether the 1-digit industry of the individual's main job prior to application. For applicants, we also include a dummy for high educated and 16 dummies for major impairment code. For definitions of baseline, dip, drop, and recovery see equation (2) and (3) in the text. Interactions of the baseline, dip, drop, and recovery variables with services are included in the model but not reported. Standard errors in parentheses are clustered at the individual level.