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## Disability insurance screening and worker outcomes

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## Disability Insurance Screening and Worker Outcomes

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## **Disability Insurance Screening and Worker Outcomes**

**Upjohn Institute Working Paper 22-375**

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### **ABSTRACT**

We estimate the returns to more targeted disability insurance (DI) programs in terms of labor force participation and worker health. To do so, we analyze male workers after an acute workplace injury that experience differential levels of application screening. We find that when workers face tighter screening requirements, they are less likely to claim disability and are more likely to remain in the labor force. We observe no differences in any physical or mental health outcomes, including reinjury. Our findings imply that imposing stricter DI screening requirements has large fiscal benefits but does not yield any detectable health costs, on the margin.

**JEL Classification Codes:** I38, I18, J18, J16

**Key Words:** disability insurance, retirement, health

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Disability insurance (DI) is a public expenditure program designed to provide income to individuals incapable of working due to health conditions. In many countries, DI costs and caseloads have been increasing in recent years, leading governments to consider alternative payment schemes and/or additional restrictions. Central to these discussions surrounding DI reform is whether DI is provided to people without sufficient need. Given the evidence that DI is a transfer program that can serve as insurance against non-health risks for some recipients (Deshpande and Lockwood, 2021), one relevant policy question is whether more targeted beneficiary screening can play a critical role in reducing spending without harming total social welfare.

Although more effective gatekeeping can lower DI rolls and reduce financial burdens, the social costs may be large if potential recipients value DI benefits more than the fiscal cost. For example, stricter DI screening rules would be inefficient if rejected applicants must return to work but experience lifelong mental or physical health problems as a result. In this paper, we use newly linked data to assess these trade-offs and evaluate whether age-based DI screening requirements for workers experiencing a health shock affect worker labor market outcomes, health, and well-being. Using data from the Austrian Social Security Register on worker status, occupation, wages, unemployment insurance (UI) claims, and DI claims, linked with individual-level health data from the Upper Austrian Health Insurance Fund database, we find that looser screening regulations subsidize retirement by inducing injured workers to claim DI and permanently leave the labor force. We also find little systematic relationship between DI denial and other types of welfare program enrollment, consistent with other work (Mueller, Rothstein, and von Wachter, 2016a). Importantly, we find that there are no positive mental or physical health benefits of claiming DI. Estimates indicate no statistically significant effect on the take-up

of opioids or antidepressants, hospital stays, physician fees, or reinjury after the initial period of injury, suggesting that DI can have large costs to society, on the margin.

For our analyses we focus on the subset of applicants at most immediate need of DI: acutely injured workers. These relatively clear-cut DI cases do not rely on subsequent appeals applications or judge leniency.<sup>1</sup> Variation in application screening depends on the workers' age and the time of the accident. In particular, workers over the age of 60 face less strict screening criteria for DI eligibility. Thus, in this paper, we compare workers aged 55–62 who are otherwise similar in terms of occupation and observable characteristics but experience a health shock during differing levels of DI screening scrutiny. We use these differences in screening levels to quantify the marginal effects of DI on measures of worker behavior and health

Our findings build on an existing literature on the labor market effects of DI and their welfare consequences, and can help to inform criteria for optimal DI eligibility (Low and Pistaferri 2015, 2020; Haller, Staubli, and Zweimüller 2020). Generally, it is well documented that DI has large disincentives for work, and previous papers have attempted to quantify this relationship. For example, existing work using randomly assigned judges to identify a marginal DI applicant shows that benefit receipt reduces labor force participation, with smaller reductions for those who are more educated (Maestas, Mullen, and Strand 2013; French and Song 2014; Autor et al. 2019). Other related work shows that DI policy changes can reduce the financial burden of the program; Gruber and Kubik (1997) study a change to the U.S. DI program in the 1970s and estimate that every 10 percent rise in denial rates led to a nearly 3 percent increase in labor force

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<sup>1</sup>This nonreliance on appeals cases is especially relevant given recent evidence that a large majority of applicants with less-severe cases receive DI based on appeal and many who are originally denied DI gain benefits due to appeal (French and Song 2014; Maestas, Mullen, and Strand 2021). Moreover, when analyzing the broader group of DI applicants, rejected applicants tend to be younger and experience greater labor force attachment (von Wachter, Song, and Manchester 2011).

participation, with even larger effects for older workers. Such findings are consistent with recent work showing that DI application claiming elasticity is highest for prime-age, high-skilled, and high-income workers (Mullen and Staubli 2016).

However, there is much less work on the health trade-offs of DI and whether policies can better target potential recipients. One such paper finds that providing financial incentive can induce DI recipients to return to work, indicating that this may be a fruitful avenue for reducing the fiscal burdens of the program and increasing productivity (Kostøl and Mogstad 2014). Moreover, there is some evidence that changing the waiting periods to receive DI benefits could induce workers to continue working (Autor, Duggan, and Gruber 2014).

Other studies linking DI to health focus on an extreme outcome mortality and show that DI has been successful at reducing mortality in the United States for some recipients (Gelber et al. 2022), although some evidence suggests that DI can increase mortality due to reduced labor supply (Black et al. 2017). Papers focusing on the historical introduction of pension programs also find reduced mortality rate for beneficiaries in the United Kingdom, with more muted effects for the United States (Jäger 2022; Stoian and Fishback 2010).

We build on this literature by studying multiple novel dimensions of short-run and longer-run physical and mental health in addition to labor market effects. To evaluate the welfare effects of a more restrictive DI screening policy, we use a Marginal Value of Public Funds framework, which calculates both direct and indirect costs for potential screened-out beneficiaries, as well as costs to the government in terms of DI payments and taxation. We find that screening out more individuals on the margin has large potential fiscal benefits relative to the direct costs to workers. Consequently, our findings paint a broader picture of the comprehensive effects of DI and can help inform policy decisions regarding optimal DI regulation.

We note that the implicit price of providing DI benefits to applicants, in terms of impacts on the labor market, is larger in Austria than effects previously documented in the United States (Haller, Staubli, and Zweimüller 2020). This is mostly due to the fact that DI in the United States is often seen as a program that can serve as a substitute to UI or other non-health shocks. Therefore, our findings may be most relevant for countries with relatively large social safety nets. Nonetheless, the conclusions from our analysis are generally relevant for governments (like the United States) that still rely on aged-based DI policies.

## **DISABILITY INSURANCE IN AUSTRIA**

Austria's DI program is financed by a payroll tax and provides partial earnings replacement to workers below the full retirement age. To be eligible for DI benefits, workers must have contributed to the program for at least 5 of the last 10 years and must not yet be eligible for age-dependent pension.

Disabilities must be attested by a licensed medical professional. A disability is classified as a mental or physical change in the wellness of an individual, sufficiently hindering them from gainful employment. Once benefits are awarded, DI beneficiaries receive monthly payments until their return to work, medical recovery, or death, although nearly all beneficiaries (96 percent) choose to remain out of the labor force.

DI has an approximate 70 percent replacement rate, calculated based on indexed capped earnings, age, and work experience. To evaluate claims, trained assessors determine whether an injured worker's occupational capacity has fallen by a significant margin as compared to an otherwise healthy worker. This margin of "occupational capacity" changes based on a worker's age. Assessors refer to a generous screening age (GSA), currently age 60. At the GSA, the

screening criteria is more relaxed, asking whether a worker is experiencing a 50 percent reduced earnings capacity in their last occupation. For younger workers, the stricter DI criteria compares earnings capacity for *any* occupation.

Until the end of 2012, the GSA was 57. However, in 2013, as part of the Stability Act, or *Stabilitätsgesetz*, Austria reformed these age-based screening requirements, slowly increasing the GSA from 57 to 60 over three years, making it more difficult for older workers to access DI benefits. In Table A1 we provide a visual display of the changes in GSA after 2012. Shaded cells indicate when cohorts lost reduced screening eligibility. Importantly, while we consider an on-the-job injury to be an exogenous shock to a worker's potential DI eligibility, we additionally use this variation in GSA over time to compare otherwise similar workers injured on the job.

## DATA

We use administrative data on all work accidents occurring between 2000 and 2017 from the Austrian General Accident Insurance Fund. Work accidents are unexpected injuries in causal relationship to the worker's occupation, which includes injuries happening both on the way to and from work and at the workplace. The law requires firms to report work accidents that led to more than three days of absence. Notably, Austrian firms do not participate in an employer's compensation program, and DI remains the primary welfare program to replace wages due to physical inability to work.<sup>2</sup>

The most common types of workplace injuries include falls and slips as well as wounds and superficial injuries from machines. Male workers experience nearly 73 percent of all

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<sup>2</sup> Employers are covered by accident insurance, which pays for medical fees and transportation to hospitals. However, this type of insurance does not cover wage replacement.



workplace injuries in Austria. Industries with the highest counts of workplace injuries include construction, manufacturing, and trade.

We link these workplace accident data with social security records from the Austrian Social Security Database (Zweimüller et al. 2009). The Social Security Database contains employment and pension histories for the universe of Austrian workers between 1972 and 2020 as well as a limited set of demographic information, such as birth year and month, sex, and blue- or white-collar status. These data also contain information on worker wages, retirement, and UI benefits. One limitation of these data is that while we are able to pinpoint DI claims, we are unable to observe applications or DI rejections. Therefore, we focus on the subset of workers who have an immediate need for DI to avoid any potential selection into the application or appeals process.

Additionally, we use medical claims data for one Austrian state from the Upper Austrian Health Insurance Fund (UAHIF). Upper Austria has approximately 1.5 million, or 17 percent, of the total inhabitants of Austria. The UAHIF is the statutory health insurance provider for all workers in regular employment. Workers on DI continue to be insured with the UAHIF, regardless of their former employment. The database contains all inpatient and outpatient claims for insured workers, including hospitalizations, physician visits, prescriptions drugs, health care expenditures, and sick leaves. Drugs are classified according to the Anatomical Therapeutic Chemical system. ICD-10 diagnoses are available only for hospitalizations and sick leaves (but not physician visits unless a sick note was issued). We restrict the sample to male workers for our preferred approach, although we later include female workers for supplemental analyses. The primary reason for this restriction is that for female workers, the statutory retirement age is 60, which coincides with the GSA threshold after 2017. For males, the retirement age is 65. We also

restrict the sample to workers aged 55–62 at the time of the accident to avoid comparing workers at substantially different ages and career stages.<sup>3</sup> In Figure A1, we show how DI take-up varies after a workplace accident by age group. As shown here, workers under the age of 55 are much less likely to claim DI (< 5 percent) after a workplace accident, as are workers over the age of 62 that soon qualify for retirement. However, workers aged 55–62 have a 20 percent chance of being enrolled in DI within 12 quarters of a workplace accident, motivating us to focus on this group.

In Table A2, we provide summary statistics for worker characteristics, including variables that proxy for pre-accident physical and mental health status. In columns 1 and 2 we present the mean and standard deviation, while in columns 3 and 4 we separately show means for the groups facing tighter and more generous DI screening, respectively. In column 5 we show the difference in means between the groups and indicate whether this difference is statistically significant. We note that the group facing tighter screening requirements is approximately 2.7 years younger, on average, but has similar experience years and wages. Moreover, we note that all health outcomes for the two groups prior to the workplace accident are not statistically different at the 5 percent level.

DI claims, of the receipt of DI benefits, increase substantially after a recorded workplace accident. We present this finding in two ways. First, in Figure 1 we show the marginal change in DI claims after a workplace accident. Notably, claimants may experience a slight lag in claim approval due to application processing times. Nonetheless, we find that the probability of claiming DI increases substantially within one year after a workplace accident, with some individuals continuing to claim DI in the following quarters.

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<sup>3</sup> Although we make this restriction for our main analyses, consistent with the literature, we also provide estimates from sensitivity tests that relax this restriction.

Next, in the left panel of Figure 2, we plot the probability that male workers claim DI before and after an accident. The increase between the pre- and post-period is around 4.7 percentage points.

After three years, 8 percent of workers have claimed DI. When we split this by age, we find that workers aged 55–62 are much more likely to claim DI compared to younger or older workers. For this group, the probability increases to almost 30 percent after three years.<sup>4</sup>

## EMPIRICAL APPROACH

To estimate effects of DI screening we use a difference-in-differences (DD) model that exploits the quasi-random timing of work accidents. For each worker  $i$  in quarter  $t$ , we have

$$y_{it} = \alpha_i + \alpha_t + \text{strict}_{it}\delta + x_{it}\beta + \varepsilon_{it}, \quad (1)$$

where  $y_{it}$  is the outcome of interest, including DI take-up, labor market status, wages, health care utilization, and prescriptions.  $\alpha_i$  and  $\alpha_t$  are worker and quarter fixed effects.  $\text{strict}_{it}$  is a dummy equal to one if  $i$  is subject to stricter DI screening, which depends on the worker's age and the time of the accident, and is equal to zero if the worker is subjected to stricter DI screening. Because we compare labor market and health outcomes of workers who have accidents at different ages,  $x_{it}$  includes a full set of age-in-years fixed effects along with other time-varying worker-level covariates, which include flexible age fixed effects. In other words, we compare same-age workers who are eligible for stricter screening after an accident based on their age relative to the GSA at the time of the accident compared to ineligible cohorts over time.

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<sup>4</sup> Notably, there is little change in DI claims for workers above 62. This is likely because as workers approach the statutory retirement age at 65, there is a strong incentive to remain in the labor market for a few more years and claim full retirement benefits.

To estimate dynamic effects, we extend Equation (1) to allow the effect of DI screening to vary 12 quarters before and 12 quarters after the work accident as follows:

$$y_{it} = \sum_{k=-12 | k \neq -1}^{12} (\tau_k - \text{strict}_{it}) \delta_k + x_{it} \beta + \varepsilon_{it}, \quad (2)$$

where  $\tau_k = 1 \{t = k\}$  indicates quarters relative to the work accident with  $t = -1$  as the base period, and the post-accident coefficients  $(\delta_0, \dots, \delta_{12})$  give estimated differences in  $y$  between workers who qualify for generous and strict DI screening relative to the base period.

Identification of the above models rests on the assumption that the trends in labor and health outcomes of workers subject to more restrictive DI screening would continue along the same trend had they been eligible for a reduced level of DI screening. In other words, we consider a worker's injury to be an exogenous shock and compare otherwise similar workers subject to differential screening requirements before and after the injury. We present evidence in support of this assumption in a number of ways. First, we show there is no discontinuous increase in accidents at the age when workers would be subjected to less generous DI screening. Second, we show that the leading coefficients  $(\delta_{-12}, \dots, \delta_{-2})$  are statistically insignificant across outcomes. This provides some support for the notion that workers do not systematically change behavior prior to a work accident.

## RESULTS

### Effects of Increased DI Screening on Labor Market Outcomes

We first present evidence that acute workplace injuries are associated with higher DI take-up and that the level of DI claiming varies depending on whether a worker is subjected to less or more harsh application screening. Figure 2 shows effects on DI take-up. In the left panel, we

plot the unconditional probability of claiming DI for both screening schemes over time relative to the accident. Prior to an accident, workers must be employed and therefore DI take-up is zero, by construction. After a worker experiences an accident, DI claims increase in both groups. However, the increase is markedly smaller for workers who qualify for stricter screening.

The right panel shows dynamic DD estimates from Equation (2), conditional on worker and age fixed effects. Similar to the results discussed above, estimates indicate a large and statistically significant effect of stricter DI screening that increases at a decreasing rate over time. If we estimate the static model in Equation (1), we find that stricter DI screening leads to a 7.8 percentage point decrease in DI take-up, on average.<sup>5</sup>

Importantly, we show that this is not due to workers manipulating themselves around the screening age cutoff. In Figure A2 we plot the probability of having a work accident for the universe of Austrian workers by age relative to the age where they experience reduced screening. If anything, accidents decrease slightly once workers age into the GSA.

In the top panel of Figure 3 we perform the same exercise for the probability of being employed. Prior to the accident, the trends for the two groups overlap. After the accident, workers in both groups are more likely to leave the labor market. However, the outflow is much weaker among those that are subject to stricter DI screening. This is mirrored by the DD estimates in the right panel. We find that, on average, increasing DI screening increases employment by 10.6 percentage points ( $p < 0.001$ ), or 11.8 percentage points over 12 quarters. In our sample, this corresponds to an additional 470 workers continuing to participate in the labor market that would have otherwise retired over three years. Notably, this is almost identical to the magnitude for the take-up in DI, providing preliminary evidence that there is little substitution to

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<sup>5</sup> When estimating effects on wages, those subject to stricter DI requirements additionally earn approximately 2,075 euros per year more, on average.

other government transfer programs, such as sick leave or unemployment insurance, for these workers.

Additionally, in the bottom panel of Figure 3, we show that more targeted DI screening has longer-run effects on wages. Prior to a work accident, workers facing both tight and generous screening criteria have similar levels of daily wages (approximately 90 euros per day). However, estimates indicate that workers facing stricter DI screening are not only more likely to reenter the workforce, but also experience higher earnings trajectories.

One concern may be that workers subjected to reduced screening are slightly older and therefore closer to retirement. We address this in two ways. First, omitting workers 60 and older who may be eligible for retirement eliminates the worry that these individuals simply take up a different government transfer. When considering only male workers aged 55–60, our DD estimates are statistically similar to the baseline results. Second, we show that these effects hold only for workers eligible for DI. In Figure A3 we estimate effects for workers who do not meet the experience criterion for DI (e.g., working 5 out of the last 10 years), and therefore are ineligible to claim DI after a workplace accident. Difference-in-differences estimates on DI take-up and employment are statistically insignificant, providing some support for the notion that differences in DI eligibility are driving our effects.<sup>6</sup>

Additionally, we note that workers screened out of DI switch to other forms of welfare, which could potentially increase fiscal costs. In Figure A4 we analyze effects on UI take-up. We find that workers subjected to stricter DI screening are no more likely to claim UI in the first two

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<sup>6</sup> We have also considered a triple difference approach, using female workers as a comparison group. Female workers are eligible for retirement at even earlier ages than male workers, and are still subject to the same screening ages for DI as male workers. Estimates indicate a statistically significant 4.7 percentage point increase in employment for those subjected to stricter DI screening, implying that our findings still hold when accounting for potential earlier retirement.

years after injury but are 2 percentage points more likely to claim UI 8–12 quarters after a workplace accident. This is consistent with other evidence from the United States and the Netherlands showing that while there is substitution from UI to DI programs, there is little substitution of disabled individuals ending up on UI (Koning and van Vuuren 2010; Mueller, Rothstein, and von Wachter 2016b).

Similarly, Figure A5 presents effects on the number of sick days taken for workers who previously experienced a workplace injury. Estimates indicate that workers subject to tighter screening take 1.6 more sick days per quarter in the quarters following an injury than their counterparts, likely driven by the relative increase in the return to work.

Finally, we check whether workers are more likely to enroll in marginal employment after claiming DI. In Austria, DI beneficiaries are eligible to return to “marginal” work for a maximum earnings of 475 euros per month. In Figure A6 we show that workers are not differentially likely to be in marginal employment if subject to more generous DI screening.

### **Effects of Increased DI Screening on Worker Health**

Next, we analyze the broader effects of increasing DI screening. In particular, we test whether screening out more marginal workers affects short- or long-run health physical and mental health outcomes. In Figure 4, we provide preliminary evidence on worker health care utilization, including hospital days, physician fees, and reinjury. These data are only available for Upper Austria; hence, our sample is reduced by almost 90 percent.<sup>7</sup>

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<sup>7</sup> For completeness, we replicate our first-stage findings with this reduced sample. Estimates follow a similar pattern to those of the full sample and indicate a 6.8 percent increase in DI take-up and a 3.5 percent increase in employment for workers facing stricter screening requirements. Estimates are significant at the 5 percent level, and the respective confidence intervals overlap with our main results in Figures 1 and 3, suggesting that our health findings likely apply in this broader context.

We find that trends in hospital days for the treatment and comparison group are almost perfectly overlapping in the raw data in left figure of panel (a). In the quarter of the accident, hospital days spike, suggesting that the accident leads to around a week-long hospital stay in both groups. After the accident, the trends converge again. Two-way fixed effects estimates indicate a 0.2 day increase in hospital stays, on average, due to tighter DI screening. Although this increase is statistically significant for quarters 0 and 2, it is too small to be economically meaningful.

In Figure 4, panels (b) and (c), we also show effects of DI screening on other measures of healthcare utilization, including physician fees and likelihood of reinjury. Estimates indicate no differential effects for the two groups for either outcome, further implying that screened out workers are no more likely to reinjure themselves when returning to work. Similarly, in Figure 4 we show effects for prescription take-up as a way to test other measures of both physical and mental health. We find no statistically significant effects for any measure, including opioids, antidepressants, or antimentia drugs. These findings further reinforce the notion that, for marginal workers, DI subsidizes retirement but yields little to no health benefits.

## **MEASURING WELFARE EFFECTS**

In this section we present the general Marginal Value of Public Funds (MVPF) framework for measuring the welfare effects of increased DI screening, as suggested by Findelstein and Hendren (2020) and Hendren and Sprung-Keyser (2020). To do so, we ask whether expanding the DI program—that is, allowing *more* individuals to claim DI—would be welfare improving. In our context, the MVPF measures the ratio between the aggregate willingness to pay for more generous DI benefit screening and the net cost of the policy to the government. We first calculate the benefits of being subject to a less-strict eligibility criteria, including any income and health



effects for the marginal workers. We then consider the direct government costs of looser DI screening, including forgone tax revenue.

In particular, the MVPF for imposing a more generous DI screening policy is as follows:

$$MVPF = \frac{WTP}{NetCost} \quad (3)$$

This statement implies that the larger the MVPF, the more welfare the government generates per dollar spent. If the policy pays for itself—that is, the policy generates revenue that more than covers the cost—then the MVPF is equal to infinity.

To start, we calculate *WTP* by measuring society’s willingness to pay (WTP) for a policy allowing for more generous screening. We estimate this willingness to pay in two ways. First, we analyze how many injured workers choose to return to work without claiming DI. Importantly, if workers instead substitute toward other programs, such as formal retirement or UI, it suggests a high disutility of labor, implying that the size of the WTP for a more generous DI program is large. In our above analysis, we find that only 20 percent of male workers aged 55–62 injured on the job claim DI within 12 quarters of an injury, corresponding to approximately 4,700 workers over three years. Reducing DI screening increases claims by 11.8 percentage points, accounting for 470 more cases per year. Based on the fact that DI has a 70 percent replacement rate, on average, this implies that the additional workers are willing to give up 7,196 euros per year in income.<sup>8</sup> Adding up this foregone income across these marginal workers, we can estimate a willingness to pay of approximately 2.6 million euros per year (17,000 euros × 470 cases / 3 years). We estimate only modest effects on UI and retirement beginning six quarters after injury, implying that the WTP for a more generous program is relatively low for this group.

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<sup>8</sup> In the four quarters just prior to the DI claim, our sample of workers injured on the job earn an average salary of 23,986 euros.

Second, we consider the effects of reduced DI screening on worker outcomes outside of the labor market to inform WTP. We estimate no difference in any health outcome across workers, indicating that the willingness to pay for improved health is zero.

Next, we calculate the denominator of the MVPF, the net DI cost per recipient, on the margin. Workers eligible for DI remain on the program as a form of retirement. In our sample, we estimate that workers claiming DI after an on the job injury receive an average yearly payment of 16,790. Therefore, the mechanical reduction in costs for increasing DI screening is equal to about 6.3 million euros over three years, or 2.1 million euros each year. Furthermore, the government experiences lost tax revenue as a result of screened out workers leaving their jobs. Using the marginal tax rates in Austria, we consider these marginal wages taxed at 20 percent, the lowest tax bracket. In this case, given the average wage for our sample of about 24,000 euros, we should expect that the government will give up 750,000 euros each year due to the additional DI claims.

Putting these two pieces together, we calculate a MVPF of reduced DI screening of 0.91. Based on our estimates, tightening the screening standards for DI has fiscal benefits with minimal health and labor market effects for the marginal worker. If such a policy were to be targeted to younger and/or healthier workers who will continue to work for many more years, welfare gains would be even larger.

## **DISCUSSION AND CONCLUSION**

In this paper we use data on worker accidents and DI claims to estimate the effects of a policy change in disability screening requirements on worker outcomes. Using linked administrative data on workers injured on the job and DI claims, we find that stricter DI

screening reduces the probability of workers permanently leaving the workforce. This induced return to work does not result in any adverse health consequences in the long run, as measured by hospital stays or prescription drug take-up. We calculate that stricter screening policies are cost effective, implying that inducing the marginal worker to stay on the job after recovery is welfare enhancing. These findings are especially relevant for governments looking to reduce the rising fiscal costs of disability payments without inducing lifelong health consequences for workers.

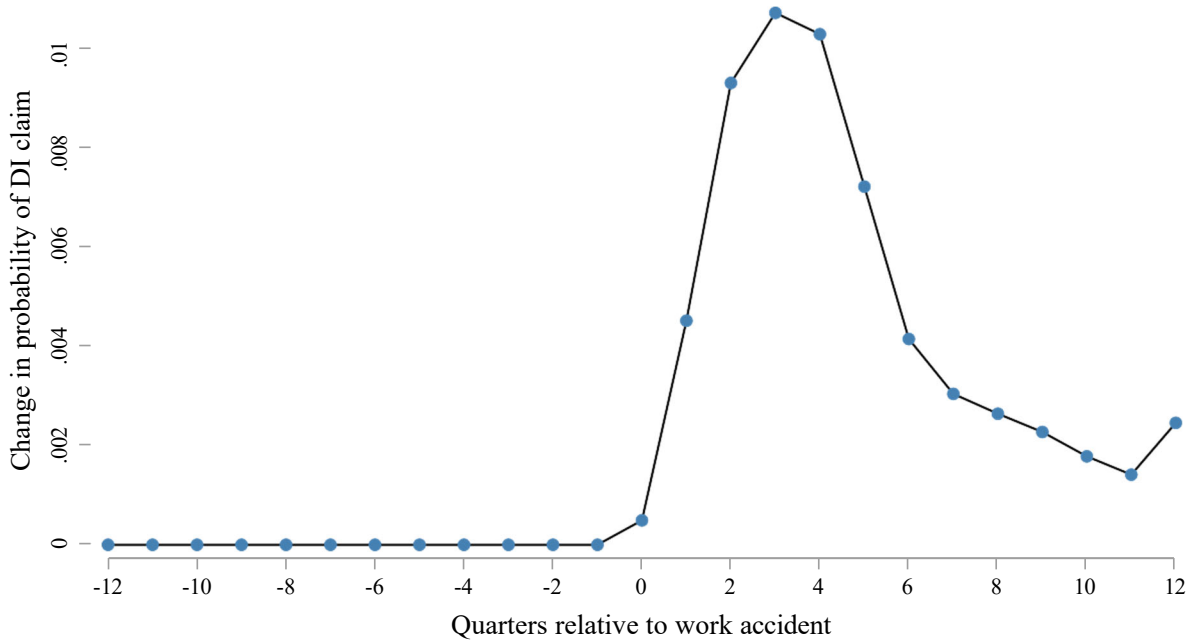
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## A. Figures and Tables

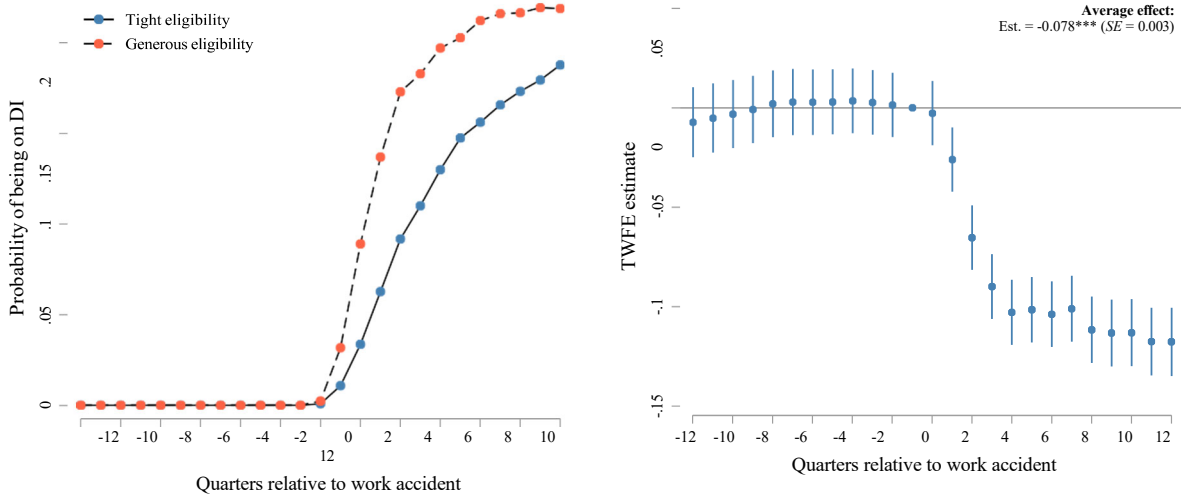
Figure 1 Change in the Probability of Claiming DI Relative to a Work Accident



NOTE: The sample includes all male workers who have a work accident aged 55–62 between 2000 and 2017,  $N = 6,394$ .

SOURCE: Individual-level data on workplace accidents is from the Austrian General Accident Insurance Fund. Data on DI enrollment and labor market participation and wages for Austrian workers is from the Austrian Social Security Database files.

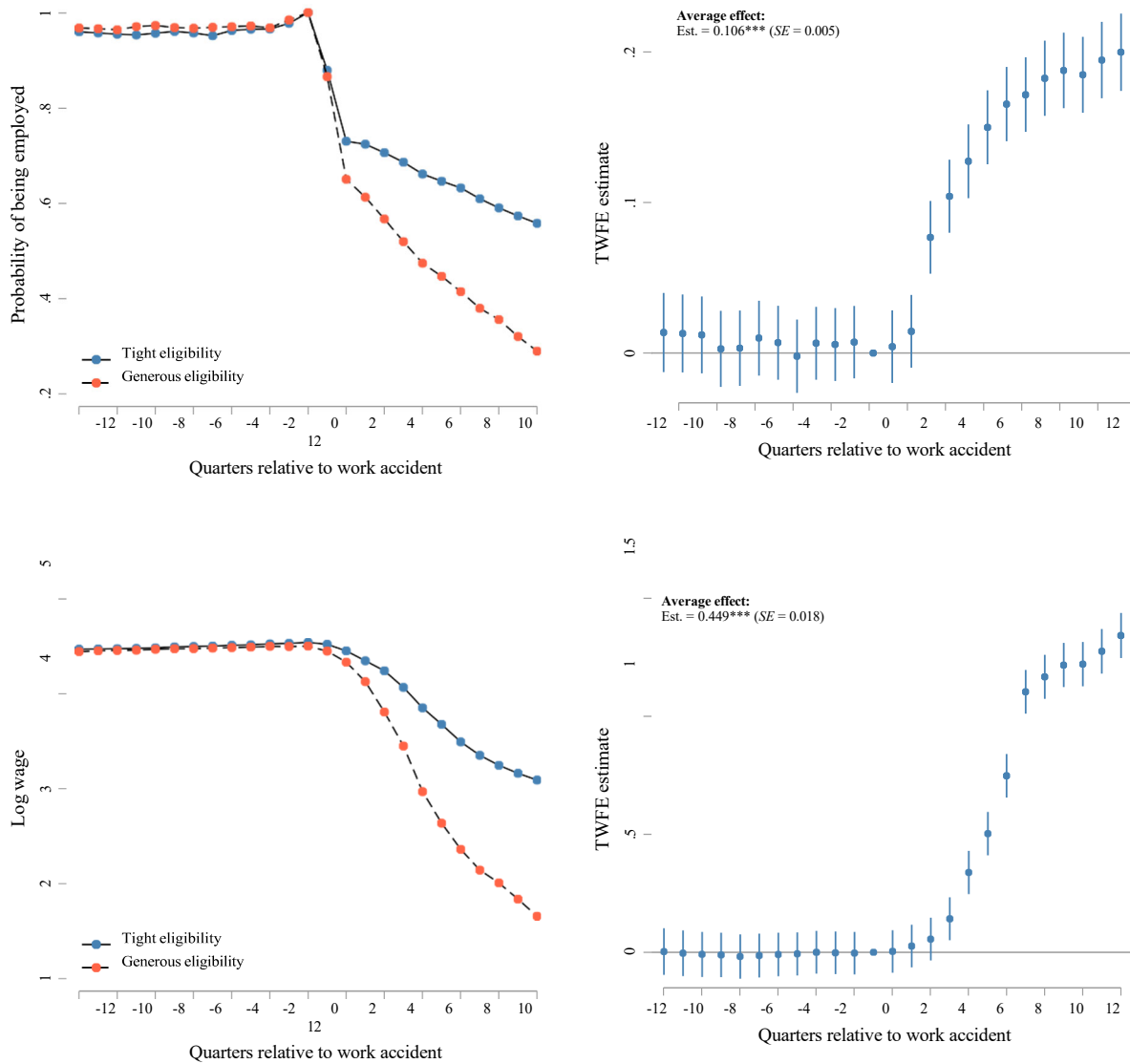
Figure 2 Probability of Claiming DI



NOTE: The sample includes all male workers who have a work accident aged 55–62 between 2000 and 2017,  $N = 6,394$ . The left panel plots raw probabilities for each quarter relative to the work accident, the right panel plots DD estimates from Equation (2).

SOURCE: Individual-level data on workplace accidents is from the Austrian General Accident Insurance Fund. Data on DI enrollment and labor market participation and wages for Austrian workers is from the Austrian Social Security Database files.

Figure 3 Probability of Being Employed and Log Daily Wages

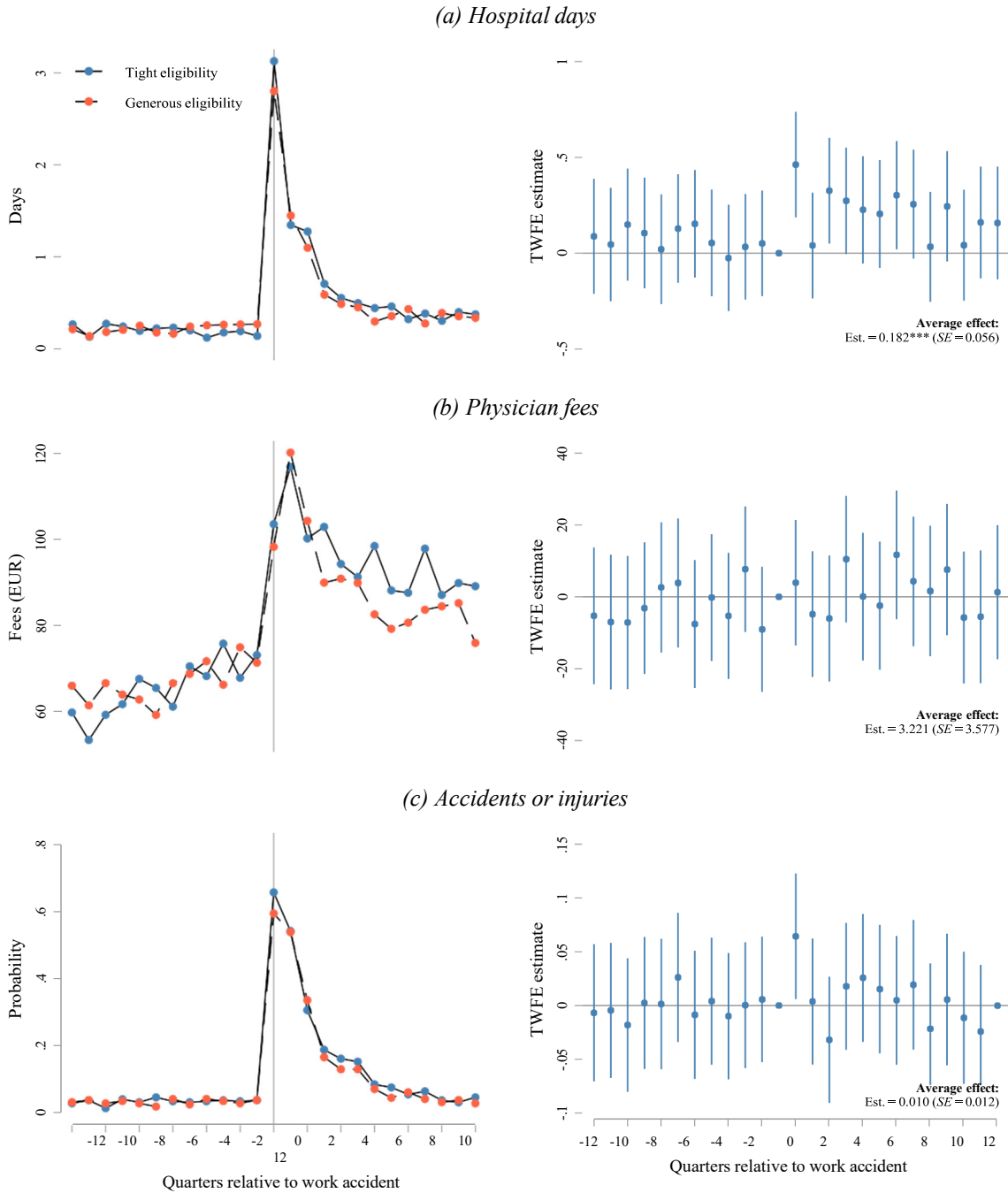


NOTE: The sample includes all male workers who have a work accident aged 55–62 between 2000 and 2017,  $N = 6,394$ . The left panel plots raw probabilities for each quarter relative to the work accident, the right panel plots DD estimates from Equation (2).

SOURCE: Individual-level data on workplace accidents is from the Austrian General Accident Insurance Fund. Data on DI enrollment and labor market participation and wages for Austrian workers is from the Austrian Social Security Database files.



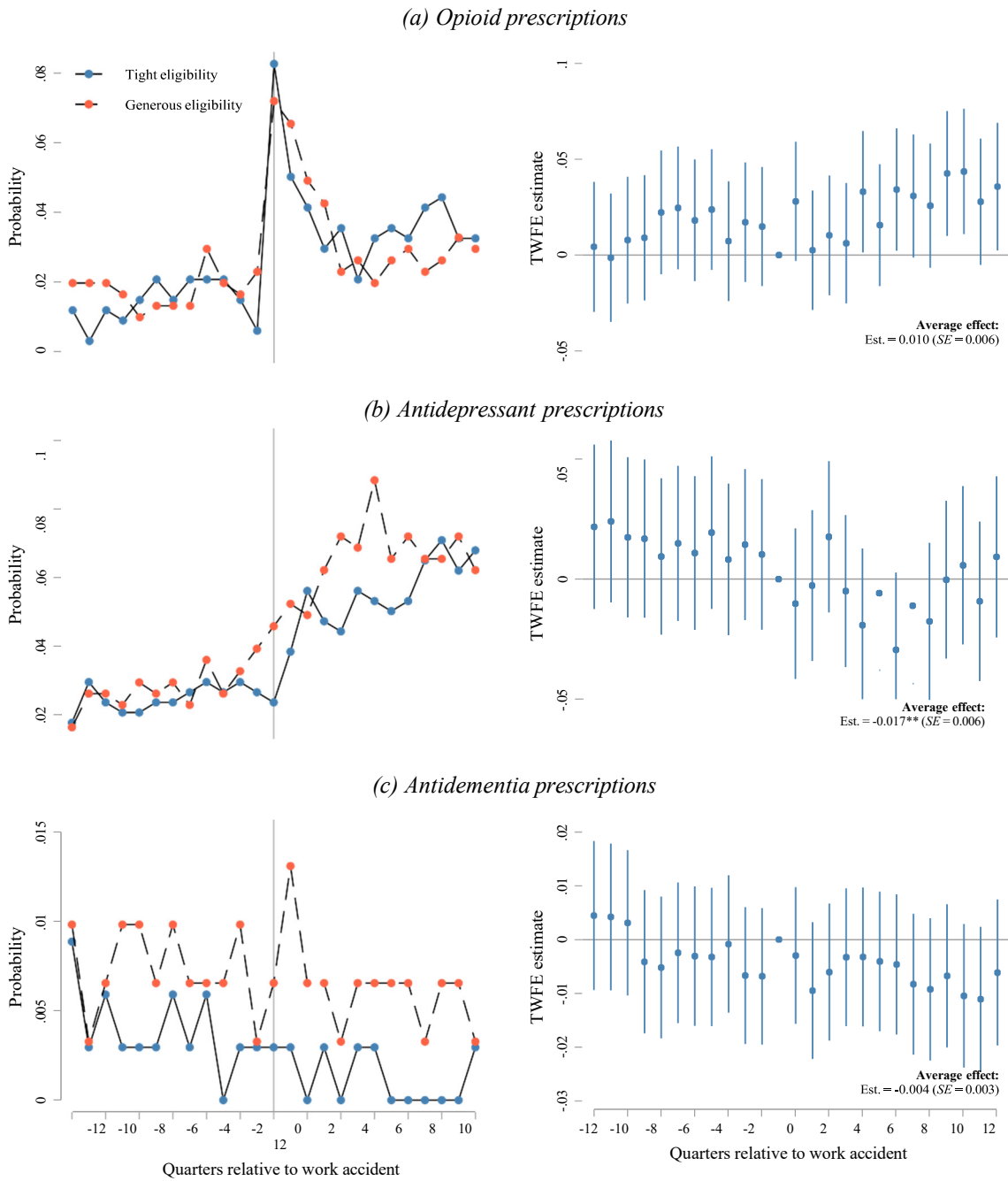
Figure 4 Health Care Utilization



NOTE: The sample includes all Upper Austrian male workers who have a work accident aged 55–62 between 2000 and 2017 ( $N = 645$ ). The left panel plots raw probabilities for each quarter relative to the work accident, the right panel plots DD estimates from Equation (2).

SOURCE: Individual-level data on workplace accidents is from the Austrian General Accident Insurance Fund. Data on DI enrollment and labor market participation and wages for Austrian workers is from the Austrian Social Security Database files. Linked data on health outcomes for Upper Austrian workers is from the Upper Austrian Health Insurance Fund database files.

Figure 5 Prescription Take-Up, Comparing Injured Workers Facing Generous vs. Tight DI Eligibility Criteria

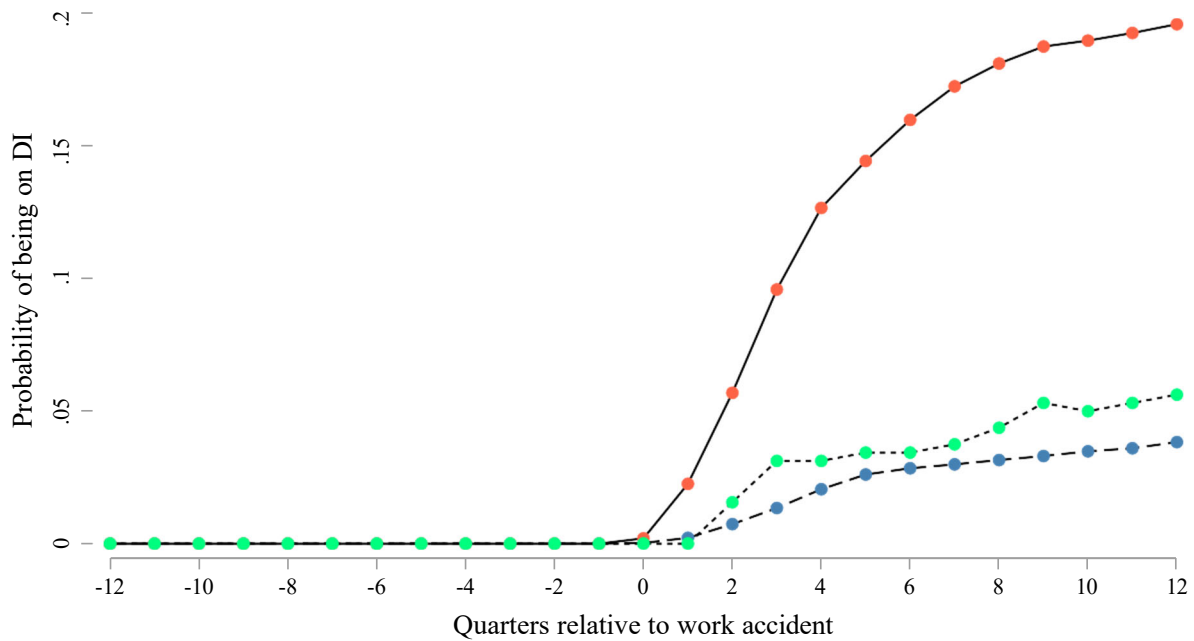


NOTE: The sample includes all Upper Austrian male workers who have a work accident aged 55–62 between 2000 and 2017 ( $N = 645$ ). The left panel plots raw probabilities for each quarter relative to the work accident, the right panel plots DD estimates from Equation (2).

SOURCE: Individual-level data on workplace accidents is from the Austrian General Accident Insurance Fund. Data on DI enrollment and labor market participation and wages for Austrian workers is from the Austrian Social Security Database files. Linked data on health outcomes for Upper Austrian workers is from the Upper Austrian Health Insurance Fund database files.

## Appendix

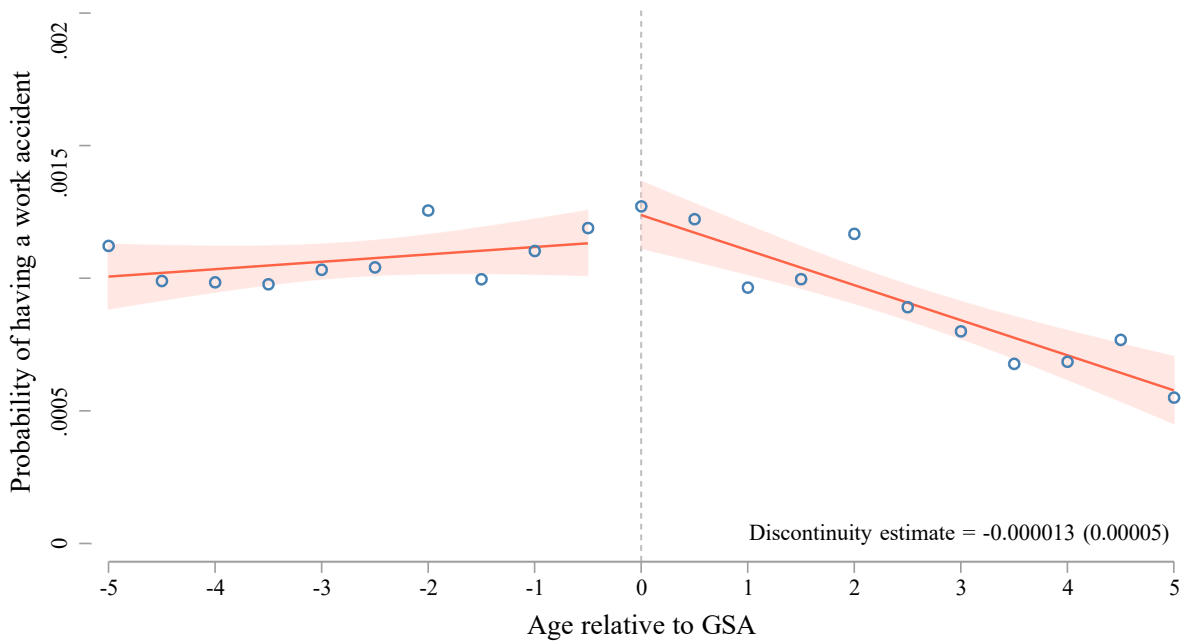
Figure A1 Probability of Filing DI Claim Over Time Relative to Work Accident, by Age



NOTE: See Figure 1. The circles connected with a dashed line represent the probability of being on DI for workers aged less than 55; the circles connected with a solid line represent our main age group of interest, 55–62; and the circles connected with a dotted line represents workers over the age of 62, who are eligible for early retirement.

SOURCE: Individual-level data on workplace accidents is from the Austrian General Accident Insurance Fund. Data on DI enrollment and labor market participation and wages for Austrian workers is from the Austrian Social Security Database files.

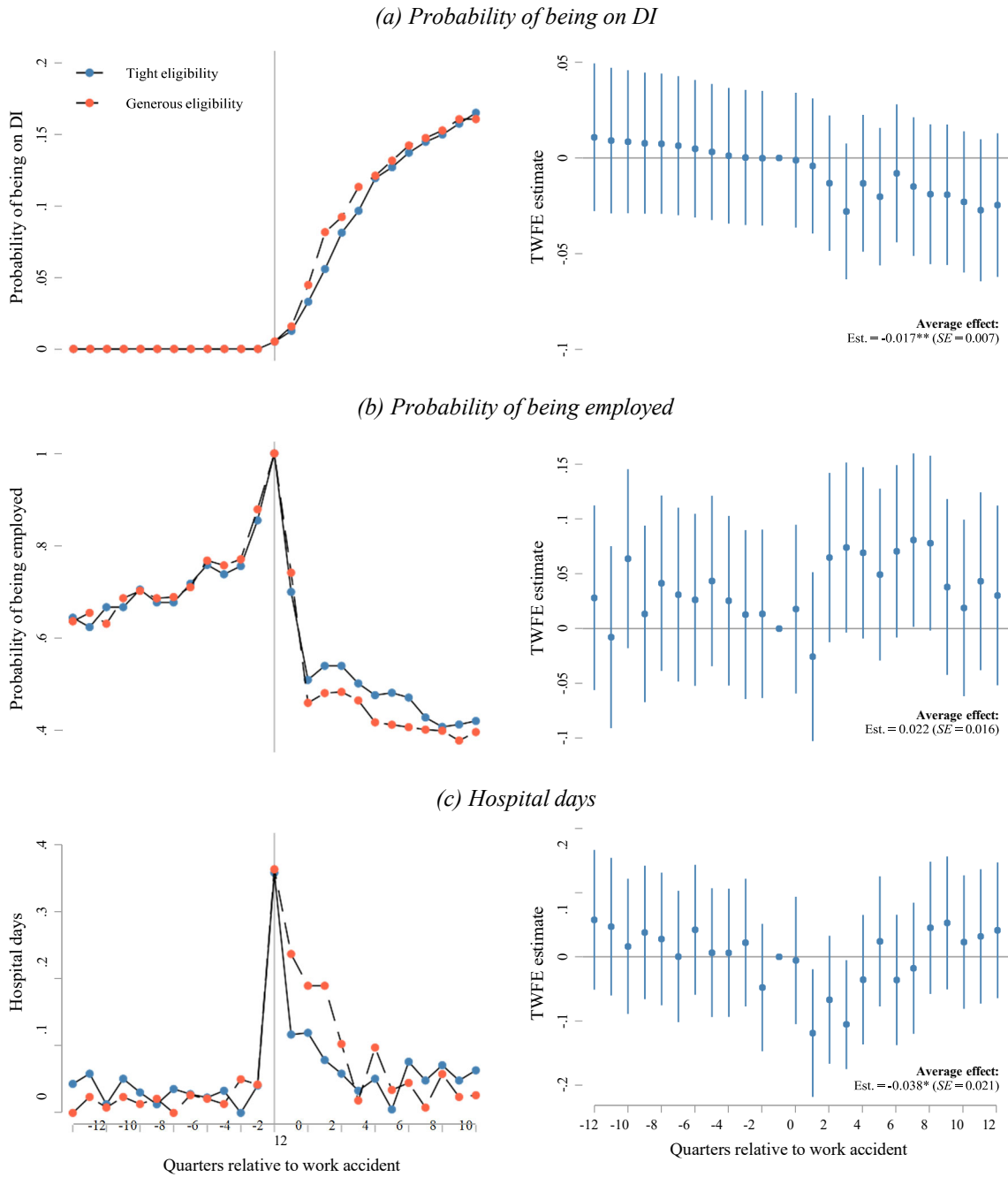
Figure A2 Probability of Experiencing a Work Accident by Age, Relative to the Generous Screening Age (GSA)



NOTE: The sample includes all male workers aged 55–62 employed at least 90 days in a given year, 2000–2017. The GSA is 57 for workers born before December 1955, 58 for workers born between December 1955 and November 1956, 59 for workers born between December 1956 and November 1957, and 60 for workers born after November 1957.

SOURCE: Individual-level data on workplace accidents is from the Austrian General Accident Insurance Fund.

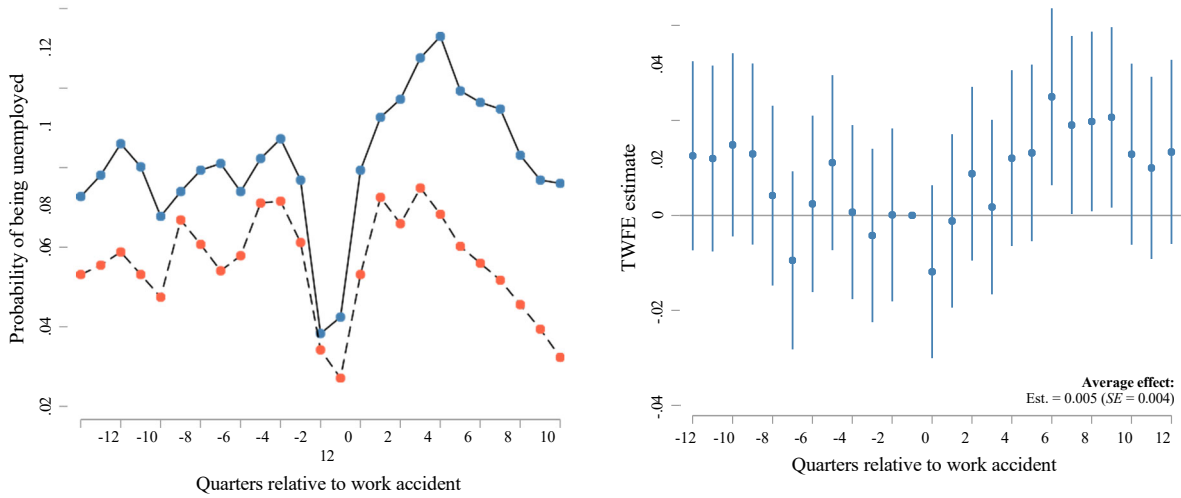
Figure A3 Placebo Check: Workers Who Do Not Meet the Experience Criterion



NOTE: The sample includes workers aged 55–62 who are employed at time of a workplace accident but do not meet the experience criterion to be eligible for DI (i.e., have not contributed for at least 5 of the last 10 years).

SOURCE: Individual-level data on workplace accidents is from the Austrian General Accident Insurance Fund. Data on DI enrollment and labor market participation and wages for Austrian workers is from the Austrian Social Security Database files. Linked data on health outcomes for Upper Austrian workers is from the Upper Austrian Health Insurance Fund database files.

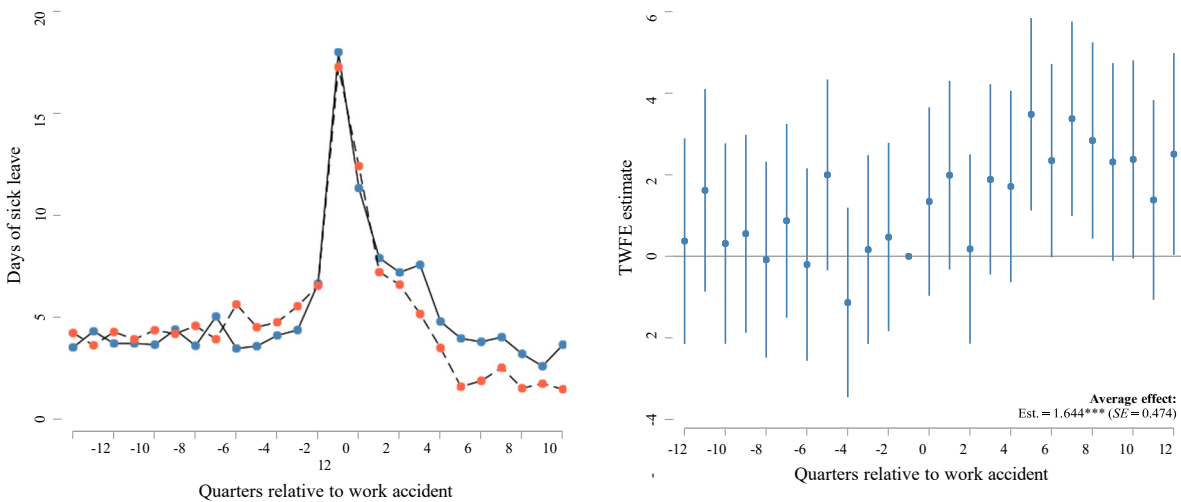
Figure A4 Probability of Claiming UI Benefits



NOTE: The left panel plots raw probabilities for each quarter relative to the work accident, the right panel plots DD estimates from Equation (2).

SOURCE: Individual-level data on workplace accidents is from the Austrian General Accident Insurance Fund. Data on DI enrollment and labor market participation and wages for Austrian workers is from the Austrian Social Security Database files.

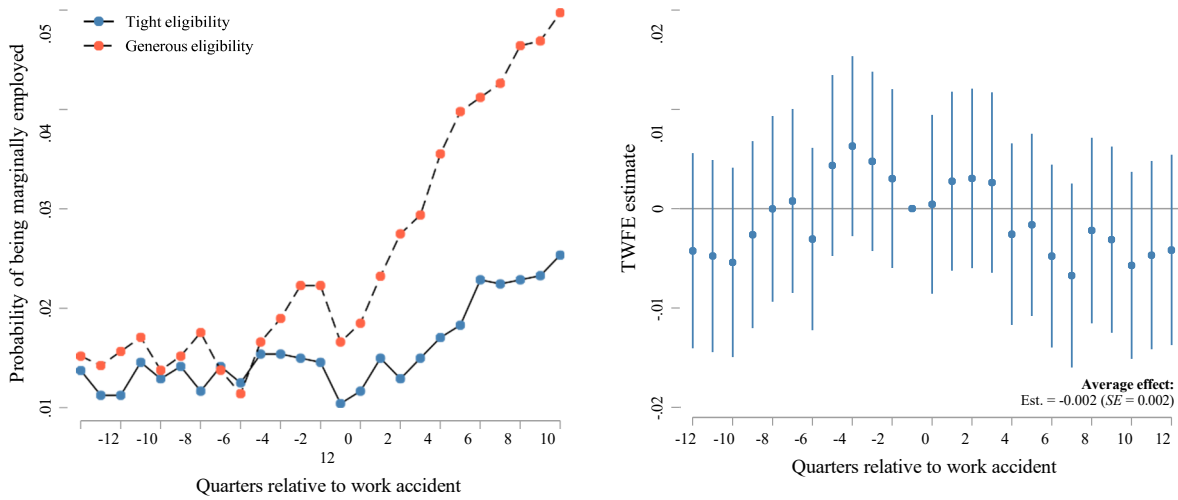
Figure A5 Sick Leave Days



NOTE: The sample includes all male workers who have a work accident aged 55–62 between 2000 and 2017 ( $N = 700$ ). The left panel plots raw probabilities for each quarter relative to the work accident, the right panel plots DD estimates from Equation (2). The outcome variable includes the number of days that a worker took sick leave in each quarter.

SOURCE: Individual-level data on workplace accidents is from the Austrian General Accident Insurance Fund. Data on DI enrollment and labor market participation and wages for Austrian workers is from the Austrian Social Security Database files.

Figure A6 Probability of Being Marginally Employed



NOTE: The left panel plots raw probabilities for each quarter relative to the work accident, the right panel plots DD estimates from Equation (2). DI recipients are eligible for marginal employment, which implies that workers can return to work for a small number of hours per month for an income not exceeding a certain threshold (475 euros as of 2021).

SOURCE: Individual-level data on workplace accidents is from the Austrian General Accident Insurance Fund. Data on DI enrollment and labor market participation and wages for Austrian workers is from the Austrian Social Security Database files.

Table A1 Relaxed Screening Age, Based on Cohorts

Cohort	Year			
	2011	2013	2015	2017
1953	58	60	62	64
1954	57	59	61	63
1955	56	58	60	62
1956	55	57	59	61
1957	54	56	58	60
1958	53	55	57	59
1959	52	54	56	58

NOTE: Cohort refers to the birth year of a worker. Each column shows the reduced DI screening age for the relevant cohorts as it changed over time. Shaded boxes highlight that some cohorts faced higher screening ages starting in 2011 due to DI policy changes.



Table A2 Summary Statistics

	Mean	Std. dev.	Tight vs. Generous Screening		
			Tight	Generous	Difference
	(1)	(2)	(3)	(4)	(5)
Age (years)	57.51	1.74	56.26	58.94	2.683***
Experience (years)	30.90	7.53	30.99	30.81	-0.173
Daily wage (EUR)	97.21	31.67	98.43	95.82	-2.611**
Upper Austrian resident	0.14	0.35	0.14	0.14	0.004
Pre-accident labor market status					
Employed	0.96	0.18	0.96	0.97	0.010***
Claiming UI benefits	0.07	0.25	0.08	0.06	-0.019***
Marginally employed	0.01	0.12	0.01	0.02	0.002*
Pre-accident healthcare utilization					
Inpatient days	0.04	0.40	0.04	0.04	0.005
Physician fees (EUR)	11.72	43.15	11.98	11.43	-0.543
Accidents or injuries	0.01	0.08	0.01	0.01	0.000
Pre-accident drug prescriptions					
Opioid prescription	0.003	0.051	0.003	0.003	0.000
Antidepressant prescription	0.005	0.073	0.005	0.006	0.001
Antidementia prescription	0.001	0.030	0.001	0.001	0.001*

NOTE: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Age, experience, wage, and residency are measured in the last quarter before the work accidents; labor market status, health care utilization, and drug prescriptions are measured over the 12 quarters preceding the work accident. Wages are set for zero for non-employed workers. Descriptive statistics include the means and standard deviations for the listed outcomes for all male workers who experience a work accident between 2000–2017. Columns (1) and (2) present means and standard errors for all injured workers, respectively, while columns (3) and (4) present means for workers eligible for tight versus generous DI screening separately. In column (5), we provide the difference in means of the respective variable between these two groups, according to a two-sample  $t$  test.  $N = 132,425$ .

SOURCE: Individual-level data on workplace accidents is from the Austrian General Accident Insurance Fund. Data on DI enrollment and labor market participation and wages for Austrian workers is from the Austrian Social Security Database files. Linked data on health outcomes for Upper Austrian workers is from the Upper Austrian Health Insurance Fund database files.