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Exploring Worker and Firm Characteristics that Drive Use of Accommodation for Workers with Disabilities

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Abstract

While several policy proposals advocate for more employer responsibility in encouraging workers to return to work after injury and disability, few studies have analyzed existing employer-based return to work programs in the U.S. or considered employer and employee factors that may facilitate or inhibit employers' incentives to accommodate workers after injury. Using administrative data from three unique accommodation programs in Oregon's workers' compensation system, we document dispersion in accommodation rates across a range of worker, firm, and injury characteristics. Then, we use variance decomposition and Oaxaca-Blinder decomposition methods to estimate the extent to which variation in use of these programs can be explained by observable factors and the extent to which unobserved barriers may affect employer and worker decisions to pursue workplace accommodation after disability. Firm effects are the largest driver of accommodation for temporary disabilities, while injury characteristics explain more of the variation in accommodation rates for permanent disabilities and vocational rehabilitation.

Key words: social insurance, disability, firm accommodation, workers' compensation, experience rating, labor market frictions
JEL codes: H53, J38

1 Introduction

Work-limiting disabilities have enormous consequences for health and labor market outcomes (Currie and Madrian, 1999). Returning to work after disability is ultimately a decision that workers make based on their ability to perform their job as well as economic and institutional factors. However, worker choices may also depend on employer decisions to accommodate and retain workers with health limitations. Worker accommodations can be any adjustment that an employer makes which enables a worker to continue working with an impairment. These adjustments can be diverse depending on the worker's need, and could include, for example, changes to the physical workspace, training for new job tasks, or flexibility in hours or location.

Accommodation is one of several non-wage amenities that workers may receive on the job. Other examples of these benefits include health insurance, retirement benefits, short- and long-term disability insurance, paid sick leave, and flexible work arrangements. While all benefits have potential value to workers, recent evidence highlights significant variation in access to these other non-wage benefits across firms and workers (Bana et al., 2022; Goldin et al., 2020; Lachowska et al., 2021; Monaco, 2015; Anand and Wittenburg, 2017; Bishow, 2015). Recent evidence also suggests that accommodation is under-provided: Nearly half of workers who would benefit from accommodation do not receive it (Maestas et al., 2019). Prior work has found that employee personality traits may play an important role in determining which individuals seek accommodation, while general employer characteristics such as firm size are not predictive of accommodation (Hill et al., 2016). However, less is known about the ways in which accommodation provision varies with other characteristics of employers and employees, and the extent to which differences in characteristics may explain the disparities in access to accommodation for workers with disabilities.

This paper provides new evidence to address these open questions. We examine data on three unique return to work accommodation programs in the Oregon workers' compensation system. Our analysis leverages detailed administrative workers' compensation claim data in Oregon, which includes information about worker demographics, occupation, injury and benefit characteristics. It also includes information about the firm at the time of injury, including the industry, firm size and type of workers' compensation insurance. These files have been linked to separate administrative data with details about the timing and use of each of three return-to-work programs. As described below, two of these programs, the Employer at Injury Program and the Preferred Workers' Program, specifically target incentives to firms that accommodate workers who experience disabilities at work. The third program provides a broader offering of vocational assistance to workers' compensation beneficiaries. This data has also been linked to the Occupational Requirements Survey (ORS), which includes data describing physical and cognitive tasks, environmental conditions and education and training prerequisites by occupation.

An examination of return-to-work programs in workers' compensation can offer several important insights to the Social Security Administration for thinking more broadly about disability policy and accommodation. A significant share of workers with disabilities, par-

ticularly those with disabilities severe enough to qualify for DI, do not return to the labor market after the onset of their impairment. Even workers with more temporary or less severe impairments suffer earnings losses for several years after a disabling event (Dworsky et al., 2022). Return to work programs offer workers accommodation typically within the first few months or years following disability onset. This early intervention may prevent a health condition from worsening and allow a worker to maintain strong connections to the labor market despite his or her impairment or work restrictions. Our companion work, Aizawa et al. (2021), finds that the provision of accommodation increases labor supply during the first two years after the onset of a work-related disability. This paper asks a complementary and equally important question: Given that accommodation is far from universally provided, what are the most important factors in determining who receives accommodation?

The return-to-work programs in this study are also unique because they provide incentives for employers, rather than workers. Several studies have examined the potential impact of financial incentives targeted at workers with disabilities (Kostøl and Mogstad, 2014; O'Leary et al., 2011), but more evidence is needed to understand what role the employer could play in enhancing the labor supply of people with disabilities. Several long-standing proposals for reforms to Social Security Disability Insurance argue that employers should shoulder more of the costs of disability, either through experience rating or requiring firms to hold private disability insurance (e.g., Autor and Duggan, 2010; Burkhauser and Daly, 2011; Liebman and Smalligan, 2013). Some evidence from European settings finds that higher levels of experience rating lead to decreases in disability benefit receipt (Hawkins and Simola, 2020; Prinz and Ravesteijn, 2020; De Groot and Koning, 2016). However, evidence in the U.S. context is scarce. Workers' compensation offers a setting where firms are subject to a mandate to hold workers' compensation insurance, as well as subject to experience rating. As a result, a better understanding of how firms participate and engage with accommodation incentives in workers' compensation could offer broader lessons for how firms may behave if similar changes were enacted for non-work disabilities covered through DI. However, few studies have analyzed existing employer-based return to work programs in the U.S. or considered employer and employee factors that may facilitate or inhibit employers' incentives to accommodate workers after injury. Our project offers a unique examination of how employers participate in three return-to-work programs in Oregon's workers' compensation system.

We begin with a detailed descriptive examination of the extent of variation in use of these accommodation programs across worker and firm characteristics. We document that even in the most commonly used of the three programs, less than one quarter of workers' compensation beneficiaries receive accommodation. Utilization varies significantly across industry, occupation and injury type. Next, we conduct a series of decomposition exercises to understand the characteristics that drive this variation. We conduct a variance decomposition exercise, drawing on methodologies from Abowd et al. (1999) and Card et al. (2013), as well as a Oaxaca-Binder decomposition. Using this method, we find that 29 percent of the variation in the largest accommodation program for temporary disabilities is driven by firm effects, while less than 4 percent is explained by worker or injury characteristics. Interestingly, the importance of each factor depends on the type of injuries that these programs address. For example, we find that firm fixed effects matter in accommodation choice for both temporary and permanent injuries. However, injury characteristics are much more

important in accommodation choices in permanent injury or vocational rehabilitation programs. Relative to these factors, we find that the worker's pre-injury occupation or task requirements do not explain much variation in any of these programs.

Next, we use the Oaxaca-Blinder decomposition to examine whether differences in accommodation rates across workers with different characteristics can be explained by differences in workers characteristics or differences in how firms accommodate such workers. This exercise first documents significant variation in accommodation use across the largest of the three accommodation programs by gender, age, injury type, and insurance type. In particular, accommodation rates vary significantly between claims from firms that are self-insured and other claims. The importance of insurance type likely reflects the key role of the employer at injury in use of the primary program,. The incentives are strongest for self-insured firms which incur the highest cost of longer workers' compensation claims, and thus have the most to gain from the program. The decomposition then shows that differences in the characteristics of workers explain the majority of the difference in accommodation rates between these groups in most cases, though differences in the relationship between characteristics and accommodation explains important shares of the variation for age and injury groups.

This finding highlights the important role of firm heterogeneity in accounting for disparities in use of non-wage benefits for workers, mirroring recent work in other settings (Lachowska et al. (2021) for unemployment insurance; Bana et al. (2022) for paid family leave and temporary disability insurance). It also provides important insight for disability policy. In particular, because firm characteristics are such an important factor in determining accommodation, it suggests that policies that incentivize employers in supporting return-to-work or stay-at-work for workers with disabilities may be effective at increasing labor force attachment.

2 Background

2.1 Workers' Compensation in Oregon

Workers' compensation is the oldest social insurance program in the United States, and each state manages its own program. In Oregon, as in 47 other states and the District of Columbia, employers are required to have workers' compensation insurance to cover medical costs and indemnity (time-loss) benefits for employees who experience injury or illness as a result of their work. Employers are required to either purchase insurance from a third party or self-insure. When workers experience an illness or injury on the job, they are required to immediately notify their employer of the accident or event and then obtain documentation from a physician describing their condition, whether the worker has any work limitations as a result of the illness or injury, and the expected duration of these limitations. All medical expenses associated with the workplace event are covered by workers' compensation insurance. Additionally, if the employee is unable to work for a period of time exceeding a standard waiting period, they are eligible to receive time-loss benefits during their recovery.

Typically, workers first receive Temporary Total Disability (TTD) Benefits which are a fraction (typically two-thirds) of their wage prior to the injury. Workers receive TTD benefits during the initial temporary period when a physician has indicated that they are completely unable to work and on the path to recovery. For example, a physician may indicate that a warehouse worker is unable to do their job for four weeks in order to recover from a severe back strain. Workers may return to the physician during their recovery and receive updated prognoses either extending or shortening the time that they are unable to work, or changing the nature of the tasks they are able to do.[1] As a result, the TTD period may be lengthened after the initial claim.

If a physician determines that the worker has reached "maximum medical improvement" and still has some residual permanent injury, workers may then receive permanent partial disability (PPD) benefits. PPD benefits are calculated based on the function of the remaining permanent disability and are paid regardless of whether the worker returns to the labor force or not. These benefits are paid, often in a lump sum, at the end of the workers' compensation claim. In Oregon, indemnity benefits - the majority of which is either TTD or PPD - comprise 45 percent of total benefits paid under the workers' compensation system (Murphy et al., 2021). The mean (median) workers' compensation spell in Oregon lasts approximately 9 (3) weeks, and approximately 20 percent of claims ultimately receive a permanent disability payment. Most employers in Oregon with at least 20 employees are required to return a worker to the same or similarly suitable job at the end of a workers' compensation claim.[2]

From the perspective of the employer, workers' compensation insurance is experience rated,

[1] In some situations workers may return to work in a limited capacity and receive Temporary Partial Disability (TPD) benefits; in practice, receipt of TPD benefits is rare.

[2] See Murphy et al. (2021) for a comprehensive overview of workers' compensation programs and https://www.oregon.gov/dcbs/reports/compensation/Pages/index.aspx for more details on workers' compensation in Oregon specifically.

meaning that premiums are based on historical claim costs of the firm. Firms that are self-insured have perfect experience rating, while firms purchasing insurance from a third party have partial experience rating. Base rates are set as a function of historical injury risk in occupation and injury categories called class codes, and individual firms' rates are updated annually - either up or down - as a function of the firm-specific historical claim costs during the three previous years. This experience rating provides an incentive for employers to increase safety on the job and reduce the incidence and severity of injury on the job. Because experience rating takes into account not only the incidence of the injury but also the cost of injury - which varies with the duration of time out of work - experience rating costs are also lower when workers are returning to work more quickly.

2.2 Accommodation Programs

In addition to traditional medical and indemnity benefits, Oregon also offers three return-to-work programs which are designed to accommodate injured workers and help facilitate and hasten their return to employment. Two of these programs provide benefits directly to employers who accommodate workers with injuries, rather than targeting employees. Return to work programs are fairly rare: Thirteen states offer a partial return to work program, and Eleven states offer programs with incentives to employers (Ashley et al., 2017). As a result, the programs in Oregon offer a unique opportunity to examine the key factors of both workers and firms that may drive accommodation use.

The largest of these three programs is the Employer at Injury Program (EAIP). EAIP incentivizes firms to offer transitional work opportunities for injured workers who have work limitations by subsidizing their wages. The target worker for EAIP is someone who has an injury, but with the appropriate accommodations or adjustments to their work, may be able to return to work in some limited ("transitional") capacity while they continue to recover. Without appropriate accommodations, this worker might otherwise stay away from work for a longer period of time while they complete their recovery. In order to be eligible for these subsidies, the employer must be the employer where the worker was injured and must offer accommodation to support the worker during this transitional work period where she may need to perform other job duties or learn new skills in order to begin transitioning back into employment. In return, the employer may receive a 45-50 percent subsidy for wages earned during the transitional work period. Employers may also receive reimbursement for costs such as worksite modification (up to $5,000), tuition, books, and fees associated with retraining and skill development (up to $1,000), or clothing costs (up to $400) (Oregon Department of Consumer and Business Services, 2020).[3]

Workers must also have an open workers' compensation claim during the time that they are accommodated in order for the accommodation expenses to be eligible for reimbursement. Workers cannot receive TTD wage loss benefits and work in a transitional capacity at the same time. Eligible claims may either be disabling claims (e.g., claims where workers receive temporary or partial time loss benefits), or non-disabling claims (e.g., claims where workers only have medical expenses covered but do not receive time loss benefits). Because the

[3]See https://wcd.oregon.gov/rtw/Pages/eaip.aspx for more details about the EAIP.

benefit targets firms, accommodated workers may not know whether the firm is claiming EAIP benefits as the result of their accommodation.

Oregon also offers another return-to-work program for employees who have permanent injuries and are unable to return to their previous job. The Preferred Worker Program (PWP) offers benefits to employers who hire workers with permanent disabilities resulting from a prior workplace event. Possible benefits to the employer include a 50 percent wage subsidy for six months of employment and reimbursement for a variety of employment-related expenses including, but not limited to those reimbursed under EAIP. The reimbursement maximum for worksite modification, clothing or other training costs is higher under PWP than they are under EAIP. Employers may also receive workers' compensation premium credit for the preferred worker and are exempt from workers' compensation costs if the preferred worker files a new claim during the first three years of employment. [4]

Finally, workers' compensation insurers also offer vocational assistance to injured workers. This assistance may be provided by vocational counselors, vocational rehabilitation interns, or return-to-work specialists, and offers a tailored suite of benefits to assist the worker in learning about new job opportunities or connecting with opportunities to build new skills in order to re-engage with the labor market.

Oregon's return to work programs are funded via the Workers' Benefit Fund (WBF), which levies employer and employee-level taxes on all firms and dedicates the collected funds to finance return-to-work programs. Unlike typical workers' compensation premiums, the return-to-work programs are funded through a payroll tax on all firms that is not experience rated. Because the costs of these programs are not internalized in the same way that other workers' compensation costs are internalized via experience rating, this further increases the firm's incentive to utilize these benefits. In our sample, EAIP is the most commonly used program: Approximately 25 percent of workers' compensation disabling claims in Oregon have some costs reimbursed via EAIP. By contrast, only 1-2 percent of claims have any associated PWP or vocational assistance costs. There is variation in use of all programs across industries, firm size, insurer types, and time, as discussed below.

[4] See https://wcd.oregon.gov/rtw/Pages/pwp.aspx for more details about the PWP.

3 Data and Descriptives

Our setting provides a rich data linkage of workplace injury, longitudinal accommodation decisions of firms, and long run labor market outcomes of workers who experience workplace injury. In this project, we use these rich data on disabilities to better understand the variation in who receives accommodation and explore the drivers behind use of accommodation, while a separate project examines the labor market effects of accommodation (Aizawa et al., 2021).

Our main data source is administrative workers' compensation claims from Oregon, provided by the Oregon Department of Business and Consumer Services, Workers' Compensation Division. The dataset includes all closed claims with a time loss benefit or EAIP use from 1987 through 2019. The claims data include detailed information including the date of injury, payment dates, claim closure date, total workdays for which time loss benefits were paid, total time loss payments, and medical expenditures. Worker information includes information about the worker's injury, including ICD codes, the nature of the injury, the event causing the injury, affected body part(s), and demographic characteristics including age, gender, occupation, industry, and pre-injury wage. All of this information is summarized over the life of the claim and included in one record for a claim. In addition, we link detailed information about use of the three accommodation programs, including transaction-level information describing the dates of program use, as well as the specific items for which employers received reimbursement (e.g., wage subsidy, or reimbursement for specific work-related expenses).

We also link the claims data to the 2021 Occupational Requirements Survey (ORS). The ORS includes data describing physical and cognitive tasks, environmental conditions and education and training prerequisites for a wide swath of jobs in the economy. We link the data on 89 job-related tasks and requirements of occupations in our dataset using six-digit Standard Occupational Classification (SOC) codes.[5] In total, the dataset provides information on job tasks for 816 unique SOC codes in our dataset. Approximately 11 percent of claims in our dataset did not have an exact match with the six-digit codes in ORS. As a result, we assign codes without a match at the six-digit level the median value of each task within the corresponding two-digit SOC code.

Our sample originally includes all closed claims between 2005-2017 in which a worker had a temporary work restriction, which amounts to 262,035 observations. In order to explore firm-specific effects, we restrict this sample to claims within firms that have at least two claims during our sample period, reducing the sample size to 242,858 observations.

Table 1 provides a basic comparison of the characteristics of the overall sample, the restricted sample with firms that have at least two claims, and the characteristics of claims with costs reimbursed through each of the return-to-work programs. The average worker in the dataset is in their early 40s, and 35 percent of workers identify as female. The average weekly wage prior to injury was $645 in 2010 dollars, and average claim duration is 64 days. Average claim medical costs is approximately $8,700. Just over one-third of the sample of claims

[5] Appendix Table 1 provides a list of all ORS tasks included in our analysis.

worked in large firms of 500 or more employees, and 20 percent of claims are in firms who are self-insured. Column (2) shows that the sample characteristics remain similar when restricting the sample to claims within firms that have at least two claims.

Table 1: Sample summary statistics

	Full sample	Analysis sample			
		All	EAIP	PWP	VR
Worker characteristics					
Age	41.6	41.7	42.5	44.7	45.1
Female	0.35	0.36	0.41	0.28	0.24
Prior weekly earnings	$645	$652	$726	$722	$794
	($387)	($388)	($401)	($336)	($330)
Claim characteristics					
Claim medical costs	$8,747	$8,616	$9,890	$34,807	$40,019
	($16,247)	($16,063)	($16,160)	($44,457)	($47,002)
Claim days w/ time loss paid	64	63	69	275	391
	(111)	(109)	(104)	(247)	(283)
Firm characteristics					
Firm over 500+ employees	0.34	0.36	0.53	0.27	0.28
Self-insured firm	0.20	0.22	0.32	0.15	0.18
Observations	262,045	242,862	59,372	3,060	4,519

Notes: Data provided by Oregon Department of Business and Consumer Services. Sample includes disabling claims in Oregon with at least two claims within a firm in 2005-2017. Standard deviations for continuous variables shown in parentheses.

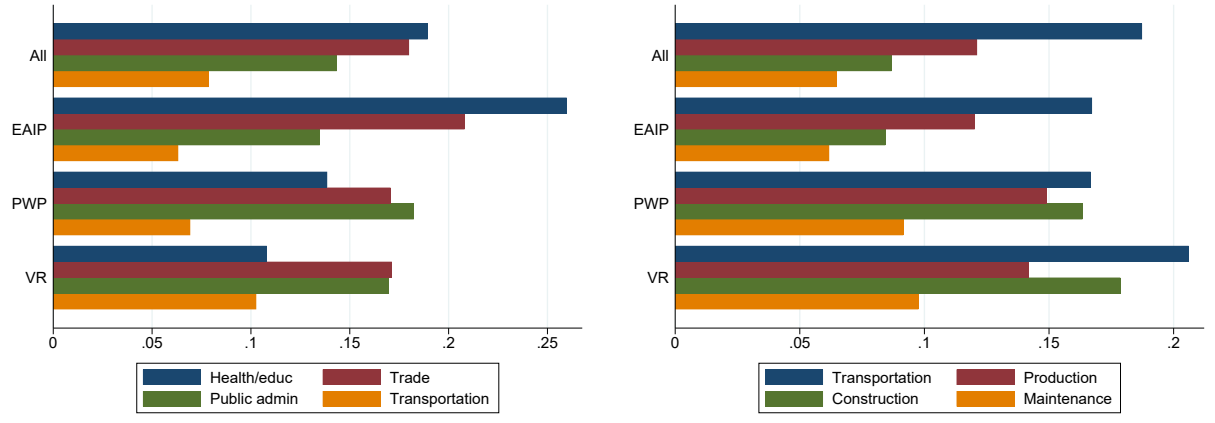
Columns (3) - (5) highlight interesting differences in the subset of claims that have participated in any of the return-to-work programs. Workers in each of these programs are slightly older (ranging between 42 and 45) and have higher weekly wages prior to injury ($726-$795). Workers accommodated through EAIP are more likely to be women than the typical workers' compensation claim (41 percent compared to 35 percent), but workers accommodated through PWP or VR are less likely to be women (28 and 24 percent, respectively). In all three return-to-work programs, workers have higher medical costs and longer claim durations than the overall sample, but the extent of these differences varies dramatically between the three programs. For example, average medical costs and claim durations are $9,890 and 69 days for EAIP claims, but $34,807 and 275 days for PWP claims and $40,019 and 391 days for VR claims. These differences likely reflect that accommodated claims tend to skew more severe than the average claim. The difference between EAIP and PWP reflects the extent of heterogeneity within the population with accommodation needs: PWP accommodates workers with permanent disabilities, while EAIP claims target workers with predominantly temporary disabilities. EAIP claims are also more likely to come from large, self-insured firms than the average sample (53 percent from employers with 500 or more employees, and 32 percent self-insured). On the other hand, PWP and VR claims are less common in large

or self-insured firms than the average claim in the sample. This difference for PWP could reflect some limits on what we are able to observe in the data: our claims data provide information about the employer at the time of injury, while most PWP benefits are typically paid to the *next* employer if the worker is unable to return to their prior job. Small firms could be less able to support the needs of a worker with disabilities or offer needed accommodations, causing them to leave.

Figure 1 shows the distribution of industries and occupations. We identify the top four industries and occupations in the main sample with at least two claims within a firm, and then examine how these shares vary across the subgroups of claims participating in each of the accommodation programs. Figure 1a shows that nearly 19 percent of all claims are in the health and education industry, followed by 18 percent in Trade, 14 percent in public administration, and 8 percent in transportation. The pattern among claims using EAIP looks similar, though a higher share fall into health/education and trade (26 and 21 percent, respectively). Among claims using PWP or VR, trade and public accommodation are more common industries than health/education.

Figure 1b shows that transportation is the most common occupation, representing between 16 and 20 percent of claims across the entire sample and all subgroups. Construction and production occupations are the next most common (comprising 12-14 percent and 8-18 percent respectively), followed by maintenance occupations. Construction occupations are more common in the PWP and VR samples than in the EAIP and overall sample.

Figure 1: Distribution of industry and occupation among accommodated claims and overall sample



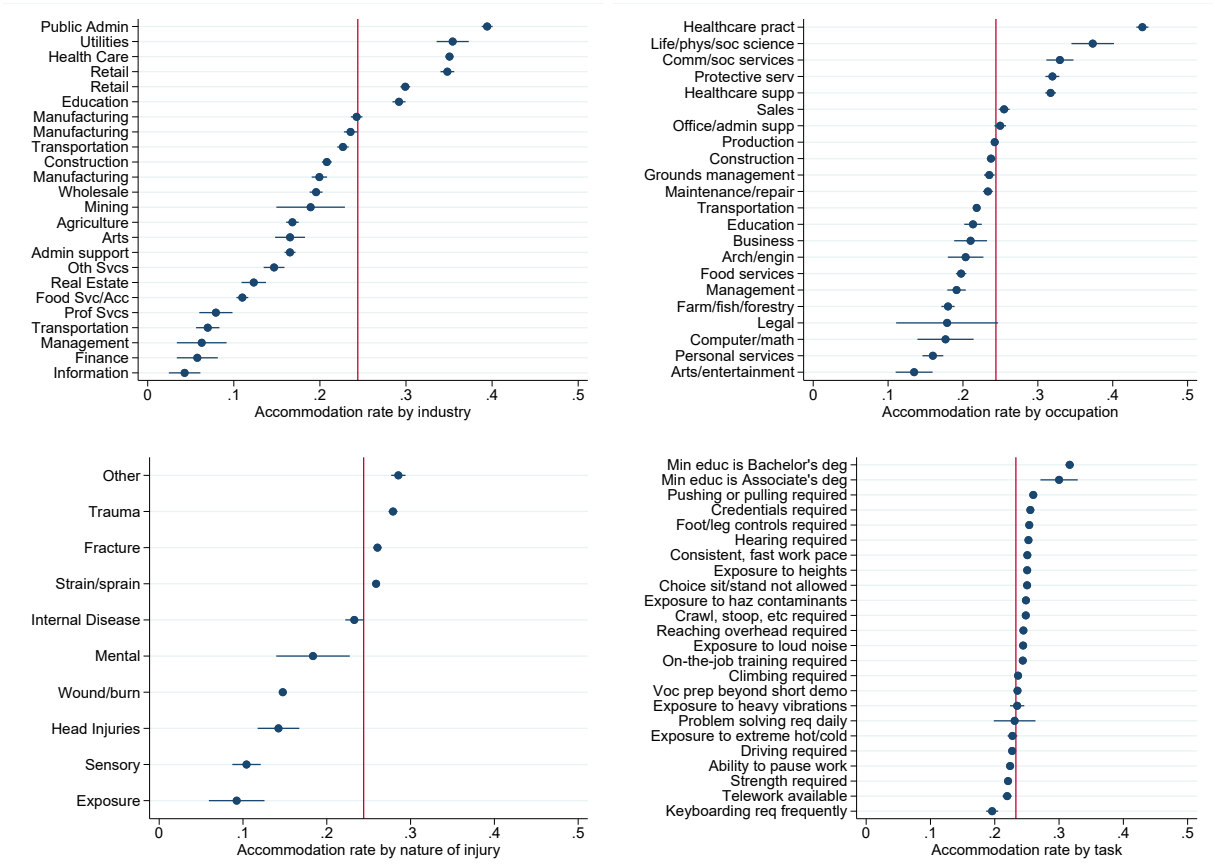
(a) Industry (b) Occupation

Notes: Data provided by Oregon Department of Business and Consumer Services. Sample includes disabling claims in Oregon with at least two claims within a firm in 2005-2017. Data shows share of claims in the top four industries and occupations in overall sample and in each of the subsamples using accommodation programs.

Figure 2 reports average accommodation rates by industry, nature of injury, occupation, and

task. Accommodation rates vary from 4 percent of claims for workers in the information industry to 39 percent of claims for workers in public administration, from 13 percent in arts and entertainment occupations to 44 percent in health care occupations and from 9 percent for exposure injuries to 28 percent for trauma injuries. Interestingly there is less variation by task.[6] Appendix Figures 1 and 2 show less variation in use of PWP and VR by industry and occupation, though there remains substantial variation in use of these programs across injury type.

Figure 2: Average EAIP accommodation rate by industry, occupation, nature of injury, and task



Notes: Data provided by Oregon Department of Business and Consumer Services, 2005-2017. Sample includes disabling claims in Oregon with at least two claims within a firm.

Section 4 further investigates more formally the drivers of the wide variation across industries and occupations in Figures 1 and 2. However, it is interesting to note that some of the more accommodating industries and occupations correspond to industries and occupations that are more traditionally unionized, such as the public administration, utilities, education, and protective services. Many of the high-accommodation occupations and industries also likely

[6]We define workers as having a particular task requirement if over a third of workers in the particular occupation must abide by the task requirement.

have large shares of workers in local or state governments. Given that accommodation rates do not vary much by job tasks, this suggests that it could be something about the structure of employment or the job, rather than the activities of the job, that determine accommodation.

Finally, Table 2 provides details on the kinds of reimbursed expenses under each return-to-work program. The majority of expenses under EAIP are for wage subsidies: Approximately 90 percent of EAIP claims receive the wage subsidy. Approximately 2 percent receive reimbursement for worksite modification, and approximately 3 percent receive reimbursement for employment expenses, mostly equipment. The average total EAIP claim expense is $2,667. The average cost of PWP is substantially higher, at $19,045. As much as 69 percent of claims receive a wage subsidy, while 36 percent receive reimbursement for worksite modification and 71 percent receive reimbursement for employment purchases. The higher average cost for PWP claims likely reflects the longer period for the wage subsidy (66 days for EAIP compared to 183 days for PWP), and the higher reimbursement limits for worksite modification and employment expenses. On average, claims with vocational assistance incur approximately $10,500 in expenses. While the data records do not provide detail on the nature of these expenses, these funds likely reflect payment to VR carriers or providers.

Table 2: Details on use of accommodation programs

	EAIP	PWP	VR
Total amount paid out	$2,667	$19,045	$10,464
	($2,565)	($31,302)	($11,402)
% using Wage subsidy	0.903	0.691	
% using Worksite modification	0.021	0.363	
% using Employment purchases		0.705	
Equipment	0.028		
Clothing	0.001		
Tuition	0.002		

Notes: Data provided by Oregon Department of Business and Consumer Services, 2005-2017. Sample includes disabling claims in Oregon with at least two claims within a firm. Standard deviations for paid amounts shown in parentheses.

4 Estimating Drivers of Accommodation Use

The descriptive statistics in the prior section demonstrate the ways in which accommodated claims differ from the typical workers' compensation claim and shows that there is wide variation in accommodation rates across a variety of firm and worker characteristics. In this section we conduct two types of decomposition analyses to better understand the most important factors driving use of accommodation in each of these programs.

4.1 Variance Decomposition

To quantify the extent to which various characteristics explain variation in accommodation for workplace disability, we first estimate:

$$a_{ijt} = \gamma' x_{ijt} + \delta' d_{ijt} + \beta' f_{jt} + \lambda_j + \theta_t + \varepsilon_{ijt} \tag{1}$$

where a_{ijt} is an indicator for whether worker i in firm j received accommodations for their injury in quarter t; x_{ijt} is a vector of worker-level characteristics (age, gender, occupation, and pre-injury wage); d_{ijt} is a vector of injury characteristics (nature, event, body part injured, medical costs, and temporary disability duration); f_{jt} is a vector of observable (and sometimes time-varying) firm characteristics (firm size, insurance type, and industry); and λ_j and θ_t are firm and quarter fixed effects, respectively. We also control for the county of the firm establishment. Standard errors are clustered at the firm level. Unlike in other decompositions similar to Abowd et al. (1999), we do not include worker fixed effects because multiple injuries by the same individual are relatively rare. The key identification assumption is that the λ_j terms are uncorrelated with ε_{ijt}, which includes unobserved worker characteristics. Table 3 shows the regression coefficients in which we gradually add additional characteristics. Of note from this exercise is that the adjusted R^2 on the regressions that only contain worker and injury characteristics only reaches 0.069, while the addition of job tasks from ORS only increases the adjusted R^2 to 0.0815. The addition of job tasks likely does not meaningfully change the R^2 because tasks may not vary significantly within two-digit occupation codes, which are included in the worker characteristics in column (2). Firm characteristics increases the adjusted R^2 to 0.152, and the addition of firm fixed effects increases it to 0.275.

We then use these estimates to statistically decompose accommodation variation into various groupings of characteristics. Specifically, following Taber and Vejlin (2020) we take the variance of equation (1), which gives (dropping subscripts for parsimony):

$$\mathrm{V}(a) = \mathrm{C}(a, \gamma' x) + \mathrm{C}(a, \delta' d) + \mathrm{C}(a, \beta' f) + \mathrm{C}(a, \lambda) + \mathrm{C}(a, \theta) + \mathrm{C}(a, \varepsilon) \tag{2}$$

where V and C are variance and covariance operators, respectively.[7]

Table 4 shows the results from this decomposition. In our primary specification shown in columns (1) and (2), the covariance term on worker characteristics is 0.0013, accounting for

[7]Note that sampling errors in our fixed effects may lead to bias in these estimates (see Kline et al. (2020) for a method to correct this bias).

Table 3: Coefficients from Regression of EAIP accommodation on worker and firm characteristics.

	(1) County + time FE	(2) + worker char	(3) + injury char	(4) + tasks	(5) + firm char	(6) + firm FE
Age at injury		-0.000***	-0.000**	-0.000**	-0.001***	-0.001***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female		0.056***	0.054***	0.053***	0.031***	0.022***
		(0.008)	(0.008)	(0.006)	(0.004)	(0.003)
Log wage		0.086***	0.083***	0.086***	0.066***	0.041***
		(0.008)	(0.008)	(0.007)	(0.006)	(0.003)
Log medical spending		0.039***	0.036***	0.037***	0.041***	0.042***
		(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Temporary disability days		-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Injury in PM		0.006**	0.007**	0.005*	0.002	0.001
		(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Private insurance					-0.149***	-0.124***
					(0.028)	(0.016)
SAIF insurance					0.042*	0.031**
					(0.023)	(0.015)
Firm size 11-49					0.016***	0.015
					(0.005)	(0.037)
Firm size 50-99					0.047***	0.019
					(0.007)	(0.054)
Firm size 100-499					0.088***	0.052
					(0.008)	(0.041)
Firm size 500+					0.177***	-0.038
					(0.017)	(0.038)
Observations	242860	242860	242860	242860	242860	242860
R-squared	0.0117	0.0606	0.0693	0.0815	0.152	0.275

Notes: Data provided by Oregon Department of Business and Consumer Services, 2005-2017. Sample includes disabling claims in Oregon with at least two claims within a firm. Each column shows a regression of an indicator for EAIP use on the worker and firm characteristics indicated in the column header. Standard errors shown in parenthesis. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

less than 1 percent of the total variance in accommodation. Injury characteristics have a covariance of 0.0057 and explain approximately 3 percent of the total variance in accommodation. Observed firm characteristics similarly account for relatively small share (less than 5 percent) of the variance. However, firm fixed effects have a larger covariance of 0.0465 and explain nearly 25 percent of the total variance in accommodation.[8] Put another way, a one standard deviation increase in the firm fixed effect is associated with an almost 14 percentage point increase in the use of accommodation, or a 59 percent increase from a mean accommodation rate of 24 percent.

Table 4: Decomposition of Variance in EAIP Accommodation Use

	Primary specification		Adding job tasks		Adding occ-ind FE		Adding occ-inj FE	
	C$(a,\cdot)$	as % of V(a)	C$(a,\cdot)$	as % of V(a)	C$(a,\cdot)$	as % of V(a)	C$(a,\cdot)$	as % of V(a)
Quarter & county FE	0.0011	0.0061	0.0011	0.0059	0.0011	0.0059	0.0011	0.0059
Worker characteristics	0.0013	0.0071	0.0014	0.0075	0.0014	0.0075	0.0014	0.0074
Injury characteristics	0.0057	0.0308	0.0056	0.0302	0.0058	0.0314	0.0049	0.0268
Firm characteristics	0.0084	0.0449	0.0087	0.0469	0.0038	0.0205	0.0079	0.0427
Firm FE	0.0465	0.2491	0.0455	0.2460	0.0456	0.2467	0.0460	0.2492
Job tasks			0.0003	0.0018	0.0004	0.0023	0.0004	0.0024
Occ-ind FE					0.0047	0.0256		
Occ-inj FE							0.0010	0.0052
Residual	0.1236	0.6619	0.1223	0.6617	0.1219	0.6600	0.1220	0.6604

Notes: Data provided by Oregon Department of Business and Consumer Services, 2005-2017. Sample includes disabling claims in Oregon with at least two claims within a firm. Each column the results of the variance decomposition including the worker and firm characteristics indicated in the column header.

In the subsequent columns, we explore adding additional covariates to the model that might otherwise be absorbed in either the firm fixed effects or the residual. In columns (3) and (4) we include job tasks from the ORS; in columns (5) and (6) we add interactions between occupation and industry, and in columns (7) and (8) we add interactions between occupation and the nature of the injury.[9] Interestingly, job tasks, which include the physical, cognitive, educational and training requirements of the occupation as described in the ORS, explain virtually none of the variance in accommodation rates above and beyond two digit occupation codes. Each of the occupation interactions similarly contribute only a small amount to the overall variance in accommodation, and neither of these specifications change the importance of firm characteristics (especially the firm fixed effects) in explaining the variation in accommodation.

Tables 5 and 6 show similar decompositions for use of PWP and vocational assistance programs. As shown in Table 5, virtually none of the variance in PWP use is explained by

[8]This is slightly larger than what is found in the wage literature, where 20 percent of the overall variation in wages is explained by firms (Card et al., 2018). Although we include firm characteristics like firm size or insurance status, the firm fixed effect may also include the effect of some of these characteristics if they do not vary over time or across claims.

[9]Note that the separate occupation and industry fixed effects are no longer absorbed in the worker and firm rows (for columns (5) and (6)), and similarly for occupation and injury for columns (7) and (8).

worker characteristics, time-varying firm characteristics or job tasks. Approximately 5 percent of the variation is explained by injury characteristics and an additional 10 percent of the variation is explained by firm fixed effects. As a result, nearly 84 percent of the variation of PWP use is unexplained by the characteristics in our data. Importantly, we only observe characteristics of the firm at injury and do not observe the characteristics of the firm that received the PWP benefits. As a result, the characteristics and identity of the employer who hires the worker *after* disability could be key inputs into this residual, though we are unable to examine this hypothesis directly.

Table 5: Decomposition of Variance in PWP Accommodation Use

	Primary specification		Adding job tasks		Adding occ-ind FE		Adding occ-inj FE	
	C$(a,\cdot)$	as % of V(a)	C$(a,\cdot)$	as % of V(a)	C$(a,\cdot)$	as % of V(a)	C$(a,\cdot)$	as % of V(a)
Quarter & county FE	0.0000	0.0015	0.0000	0.0015	0.0000	0.0014	0.0000	0.0015
Worker characteristics	0.0000	0.0014	0.0000	0.0006	0.0000	0.0006	0.0000	0.0006
Injury characteristics	0.0006	0.0504	0.0006	0.0504	0.0006	0.0504	0.0006	0.0471
Firm characteristics	0.0000	0.0019	0.0000	0.0020	0.0000	0.0013	0.0000	0.0019
Firm FE	0.0013	0.1053	0.0013	0.1052	0.0013	0.1056	0.0013	0.1051
Job tasks			0.0000	0.0011	0.0000	0.0008	0.0000	0.0009
Occ-ind FE					0.0000	0.0027		
Occ-inj FE							0.0001	0.0050
Residual	0.0104	0.8395	0.0104	0.8392	0.0104	0.8371	0.0104	0.8379

Notes: Data provided by Oregon Department of Business and Consumer Services, 2005-2017. Sample includes disabling claims in Oregon with at least two claims within a firm. Each column the results of the variance decomposition including the worker and firm characteristics indicated in the column header.

Similar to PWP use, Table 6 shows that injury characteristics and firm fixed effects are again the strongest factors determining the variance in use of VR. Here, interestingly, the injury characteristics account for the largest share (17 percent) of the overall variation, while firm fixed effects account for just under 10 percent of the variation.

There are several implications from these analyses. First of all, the identity of the firm at injury is a strong factor in determining use of all accommodation programs. The identity of the firm accounts for the largest share (nearly 25 percent of the variance) in the EAIP program, which directly incentivizes the employer at injury. The identity of the firm at injury explains approximately 10 percent of the variation in use of PWP and VR programs, even though these programs do not directly incentivize the firm at injury. It could be possible that subsequent firms hiring the permanently injured workers are similar to the firm at injury, so the fixed effects could be correlated. Injury characteristics also play a large role in determining variation in use of PWP and VR, suggesting that some injuries are more amenable to accommodation and successful return to work than others.

Finally, we note that even after including a rich set of firm and worker controls, we still find that a significant portion of the variation in accommodation remains unexplained. We conjecture that this residual is unlikely to reflect permanent unobservable characteristics

Table 6: Decomposition of Variance in Use of Vocational Assistance

	Primary specification		Adding job tasks		Adding occ-ind FE		Adding occ-inj FE	
	C$(a,\cdot)$	as % of V(a)	C$(a,\cdot)$	as % of V(a)	C$(a,\cdot)$	as % of V(a)	C$(a,\cdot)$	as % of V(a)
Quarter & county FE	0.0000	0.0018	0.0000	0.0018	0.0000	0.0018	0.0000	0.0018
Worker characteristics	0.0001	0.0032	0.0000	0.0025	0.0000	0.0024	0.0000	0.0025
Injury characteristics	0.0031	0.1717	0.0031	0.1717	0.0031	0.1717	0.0030	0.1659
Firm characteristics	-0.0000	-0.0012	-0.0000	-0.0012	0.0000	0.0011	-0.0000	-0.0005
Firm FE	0.0018	0.0990	0.0018	0.0994	0.0018	0.1009	0.0018	0.0982
Job tasks			0.0000	0.0003	0.0000	0.0001	-0.0000	0.0001
Occ-ind FE					0.0001	0.0050		
Occ-inj FE							0.0002	0.0087
Residual	0.0133	0.7254	0.0133	0.7255	0.0132	0.7240	0.0132	0.7235

Notes: Data provided by Oregon Department of Business and Consumer Services, 2005-2017. Sample includes disabling claims in Oregon with at least two claims within a firm. Each column the results of the variance decomposition including the worker and firm characteristics indicated in the column header.

of workers or injuries,[10] but instead reflects a match-specific component of accommodation whereby accommodation provision is highly predicated on the specific combination of injury, worker, and firm circumstances. Other work suggests that factors such as workplace culture and the extent to which firms invest in their workers may be central to take-up of workplace and work-related public insurance benefits more generally (Bana et al., 2022; Goldin et al., 2020).

4.2 Oaxaca Blinder Decomposition

Next, we conduct an Oaxaca Blinder decomposition for another perspective to understand the ways in which accommodation use varies. The variance decomposition is useful in understanding the factors which are the greatest overall drivers in accommodation use. The Oaxaca Blinder analysis, on the other hand, elucidates the ways in which accommodation rates may vary between two groups of workers. We chose four comparisons: female versus male workers, older versus younger workers, muscle strains versus other injuries, and self-insured firms versus not self-insured firms. We selected these groupings for a few reasons. First, in our other work (Aizawa et al., 2021) we use machine learning techniques to predict accommodation use and find that the self-insurance status of the firm is one of the strong predictors. Second, muscle strains are the largest category of injuries, are more likely to be accommodated than other major injury types and were also found to be an important predictor in Aizawa et al. (2021). Finally, age and gender are protected classes and thus merit particular scrutiny when studying equity in benefits across types of workers.[11]

[10] If the relative importance of observable to permanent unobservable factors is the same for workers and firms, then worker permanent unobservables would only make up 4% of the variance in EAIP accommodation.

[11] We had originally planned to use machine learning more extensively to select groups for this decomposition, but decided that the rationales listed here and our prior machine learning analysis with these data provide sufficient justification for our selection.

For each of these breakdowns, we ask: Are these differences the result of differences in the characteristics of the group (e.g., is one group of workers more likely to work in the types of firms that accommodate workers), or differences in the ways in which the characteristics of the groups are associated with the likelihood of accommodation? The Oaxaca-Blinder decomposition provides insight into this question.

To estimate the Oaxaca-Blinder Decomposition, we first estimate two regressions for two mutually exclusive groups in the data (e.g., male and female claimants) as follows:

$$A_{Fit} = X_{Fit}\beta_F + \varepsilon_{Fit} \tag{3}$$
$$A_{Mit} = X_{Mit}\beta_M + \varepsilon_{Mit} \tag{4}$$

where A_{Fit} is an indicator for whether a female (male) worker F_i (M_i) received accommodations for their injury in quarter t and X_{Fit} (X_{Mit}) is a vector of worker-level characteristics for female (male) workers.

Using the resulting coefficients, we can predict accommodation rates at the average values of observed X_{it} characteristics for the two groups and estimate the difference in accommodation rates between them. Re-arranging the two equations above, we can decompose the difference in accommodation rates $A_{Fit} - A_{Mit}$ into differences in the average characteristics of male and female workers ($\beta_F(\overline{X}_{Fit} - \overline{X}_{Mit})$), or differences in the relationship between characteristics and accommodation (as reflected in the coefficients), when holding characteristics constant ($(\overline{X}_{Mit}(\beta_F - \beta_M))$).

Table 7: Oaxaca-Blinder Decompositions of EAIP use

	Gender	Age	Injury type	Insurance type
Group 1	0.2145	0.2177	0.2130	0.1996
Group 2	0.2663	0.2451	0.2488	0.3651
Difference	-0.0518	-0.0274	-0.0357	-0.1654
Characteristics	-0.0241	-0.0440	-0.0075	-0.1119
Coefficients	-0.0285	0.0207	-0.0376	-0.0544
Interaction	0.0009	-0.0040	0.0093	0.0009

Notes: Data provided by Oregon Department of Business and Consumer Services, 2005-2017. Sample includes disabling claims in Oregon with at least two claims within a firm. Each column the results of a separate Oaxaca-Blinder Decomposition. In column (1), Group 1 is men and Group 2 is women. In column (2), Group 1 is workers under 40 and Group 2 is workers 40 and older. In column (3), Group 1 is all other injuries and Group 2 is muscle strain injuries. In column (4), Group 1 is privately insured or SAIF-insured firms, and Group 2 is self-insured firms.

Table 7 shows the results for decompositions of EAIP use. The first two rows show the average EAIP use rates for two distinct groups as indicated in the column header. In column (1), Group 1 is men and Group 2 is women. In column (2), Group 1 is workers under 40 and

Group 2 is workers 40 and older. In column (3), Group 1 is all other injuries and Group 2 is muscle strain injuries. In column (4), Group 1 is privately insured or SAIF-insured firms, and Group 2 is self-insured firms. The third row shows the difference in accommodation rates between the two groups (Group 2 minus Group 1). The final three rows divide the overall difference into differences in characteristics, coefficients, or the interaction between the two.

Across the four decompositions considered, the largest difference in accommodation rates is in insurance type: EAIP use is 16 percentage points higher in self-insured firms than other firms. The decomposition reveals that the majority of this difference (11 percentage points) is due to differences in the characteristics of self-insured firms, while 5 percentage points of the difference can be explained by differences in how those characteristics affect accommodation rates. The second largest difference in accommodation rates occurs across genders, with women being approximately 5 percentage points more likely to be accommodated through EAIP than men. In this case, the difference is split fairly evenly between characteristics and coefficients. Sprains are 3.5 percentage points more likely to be accommodated than other injuries, though in this case most of that difference is driven by differences in the coefficients rather than characteristics. Finally, workers over 40 are 2.7 percentage points more likely to be accommodated than younger workers. In this case, the characteristics of these workers in fact *over*-explains the observed difference. In other words, if the relationship between worker characteristics and accommodation were the same for younger and older workers, the differences in accommodation rates would be even larger (with older workers being 4.4 percentage points more likely to be accommodated). However, differences in the relationship between characteristics and accommodation for younger and older workers (while holding characteristics constant) offsets this difference to some degree.

Tables 8 and 9 show much smaller absolute differences in use of PWP and VR across the same four groupings. However, given the fact that a smaller share of claims use these programs, these small absolute differences reflect much larger relative differences compared to EAIP. For PWP, injury types have the largest difference in use of the program: workers with strains and sprains are 1 percentage point less likely to use EAIP than other injury types. Differences in PWP across the other injury types is approximately half a percentage point. All the differences in PWP use are split fairly evenly between differences in coefficients and characteristics except for age, where the overall differences are driven by differences in characteristics. The smaller variation in insurance type here could again reflect the fact that this difference is decomposed based on insurance type for the employer at injury, rather than the employer re-hiring the injured worker and likely receiving the majority of the PWP subsidy.

Table 9 shows that men and older workers are both 1 percentage point more likely to use VR than women and younger workers. Non-sprain injuries are nearly 2 percentage points more likely to use VR than sprains. Finally, privately insured or SAIF-insured firms are also more likely to use VR than self-insured firms. As was the case for PWP, the differences in VR use are split fairly evenly between differences in coefficients and characteristics except for age, where the overall differences are driven by differences in characteristics.

The Oaxaca-Blinder decomposition documents the significant sources of variation in use of

Table 8: Oaxaca-Blinder Decompositions of PWP use

	Gender	Age	Injury type	Insurance type
Group 1	0.0143	0.0094	0.0189	0.0138
Group 2	0.0100	0.0155	0.0079	0.0089
Difference	0.0044	-0.0061	0.0110	0.0048
Characteristics	0.0033	-0.0054	0.0051	0.0030
Coefficients	0.0010	-0.0007	0.0031	0.0021
Interaction	0.0000	-0.0000	0.0028	-0.0004

Notes: Data provided by Oregon Department of Business and Consumer Services, 2005-2017. Sample includes disabling claims in Oregon with at least two claims within a firm. Each column the results of a separate Oaxaca-Blinder Decomposition. In column (1), Group 1 is men and Group 2 is women. In column (2), Group 1 is workers under 40 and Group 2 is workers 40 and older. In column (3), Group 1 is all other injuries and Group 2 is muscle strain injuries. In column (4), Group 1 is privately insured or SAIF-insured firms, and Group 2 is self-insured firms.

Table 9: Oaxaca-Blinder Decompositions of Vocational Assistance Use

	Gender	Age	Injury type	Insurance type
Group 1	0.0229	0.0136	0.0296	0.0200
Group 2	0.0124	0.0236	0.0108	0.0155
Difference	0.0105	-0.0099	0.0188	0.0045
Characteristics	0.0080	-0.0103	0.0083	0.0043
Coefficients	0.0050	-0.0008	0.0059	0.0012
Interaction	-0.0025	0.0012	0.0046	-0.0009

Notes: Data provided by Oregon Department of Business and Consumer Services, 2005-2017. Sample includes disabling claims in Oregon with at least two claims within a firm. Each column the results of a separate Oaxaca-Blinder Decomposition. In column (1), Group 1 is men and Group 2 is women. In column (2), Group 1 is workers under 40 and Group 2 is workers 40 and older. In column (3), Group 1 is all other injuries and Group 2 is muscle strain injuries. In column (4), Group 1 is privately insured or SAIF-insured firms, and Group 2 is self-insured firms.

these programs, especially for EAIP. The importance of insurance type in particular likely reflects the key role of the employer at injury in the EAIP program, where the incentives are strongest for self-insured firms which incur the highest cost of longer WC claims, and thus have the most to gain from the program. Differences in the characteristics of workers explain the majority of the difference in accommodation rates between these groups in most cases, though differences in the relationship between characteristics and accommodation explains important shares of the variation for age and injury groups.

5 Conclusion

Despite the potential for accommodation to help many workers with disabilities, it is often under-provided, and little evidence exists to understand why. This paper provides a first step in understanding some the drivers of accommodation use. We examine worker and firm characteristics of participants in three return-to-work programs in Oregon's workers' compensation system which provide accommodations to injured workers if they return to work. Our analyses document significant variation in use of these three programs across a variety of worker and firm characteristics including industry, occupation, and injury type.

We then conduct a series of decomposition exercises to understand the relative importance of various firm and worker characteristics in explaining this variation. First, we conduct a variance decomposition of use of the accommodation programs. We find that firm fixed effects, or the identity of the firm, explain nearly 25 percent of the variation in use of the EAIP, an accommodation program which offers transitional work opportunities to employees with temporary disabilities. Firm fixed effects are also the most important explanatory factor for the variation in PWP, the accommodation program for permanent disabilities, explaining 10 percent of the variation in use of this program. While firm fixed effects also explain some of the variation in use of vocational rehabilitation, injury characteristics have the most explanatory power for VR, accounting for 17 percent of the variation in VR use. Across all three programs, however, a significant portion of the variance remains unexplained after accounting for a comprehensive set of worker, injury and firm characteristics. This suggests that other factors, such as possibly an employer-employee match-specific component, also play an important role in the provision and use of accommodation.

We also document significantly different accommodation rates between workers with different characteristics including gender, age, injury type and insurance type. To better understand the reasons for differences between these groups, we conduct a series of Oaxaca-Blinder decompositions. In particular, do variations in accommodation result from differences in the characteristics between different types of workers, or differences in how a given set of characteristics affect the likelihood of accommodation? We again find large and meaningful differences in accommodation for temporary disabilities across insurance types, a characteristic determined at the firm level. The majority of this difference is due to differences in the worker and firm characteristics between claims in self-insured firms and firms with other insurance arrangements, a result that again highlights the importance of the firm in providing accommodation for temporary disabilities. There are meaningful variations in ac-

commodation across age, gender and injury type as well, though these differences result from a combination of differences in characteristics and coefficients.

These findings will help SSA develop and support effective policies to encourage return-to-work among individuals experiencing disability, as rehabilitation and return-to-work is a core focus of programs like the Social Security Disability Insurance program and the Supplemental Security Income program. Specifically, across all of these analyses, our findings consistently show that firm-side factors are important determinants of accommodation, particularly for the EAIP program for temporary disabilities, which most directly affects the incentives of the employer at injury. This has several implications for thinking more broadly about policy implications. First, our results suggest that policies that engage both workers and employers may have more impact than policies that only target workers. However, many of SSA's previous demonstrations have focused on workers (see Moffitt and Gregory (2022) for a review). SSA could consider developing new demonstrations that target employers, perhaps in industries or regions with relatively high disability rates. Second, the importance of the firm in determining accommodation raises the potential for inequity if otherwise similar workers may be equally qualified and in need of accommodation, but have different accommodation experiences simply due to the firm at which they work. However, understanding the importance of the firm also offers an opportunity to correct these inequities by targeting accommodation incentives to firms, or reducing other firm-specific barriers to providing accommodation. Our companion paper Aizawa et al. (2021) provides evidence that firms can be responsive to incentives to accommodate workers with disabilities, and targeted incentives may offer one opportunity to reduce inequities in access to accommodation. Regardless of how targeted these incentives are, they may also be effective in increasing accommodation rates overall to address the broader problem of under-provision of accommodation.

Our findings also highlight that the firm's role is most important for workers with temporary disabilities. Admittedly, that finding may be sensitive in part to some data limitations given that we only observe the firm at injury, and the firm incentives for the PWP program mostly accrue to the *next* employer who hires the worker with permanent disability. Still, the strong role of the employer in the case of temporary disabilities highlights the role for the firm to intervene early and encourage return-to-work; providing firm incentives for workers with more permanent disabilities may be an ill-timed and be a less productive intervention.

Finally, we note that in the variance decomposition exercises in particular, a substantial amount of variation in accommodation rates remains unexplained even after accounting for firm and worker characteristics. This suggests that other unobserved factors, such as a firm-employee match-specific component may also be an important consideration in accommodation rates. We view this as an important area for future research in return to work policy.

References

Abowd, J. M., F. Kramarz, and D. N. Margolis (1999). High wage workers and high wage firms. *Econometrica 67*(2), 251–333.

Aizawa, N., C. Mommaerts, and S. Rennane (2021). Firm investment, labor supply, and the design of social insurance: Evidence from accommodations for workplace disability. Technical report, Retirement & Disability Research Center, University of Wisconsin-Madison.

Anand, P. and D. Wittenburg (2017). An analysis of private long-term disability insurance access, cost, and trends. *Monthly Lab. Rev. 140*, 1.

Ashley, J., W. Cashdollar, R. Etcheverry, and K. Magill (2017). Transition back to work: Policies to support return to work after illness or injury. Technical report, IMPAQ International.

Autor, D. H. and M. G. Duggan (2010). Supporting work: A proposal for modernizing the u.s. disability insurance system. *Center for American Progress and the Hamilton Project*.

Bana, S., K. Bedard, M. Rossin-Slater, and J. Stearns (2022). Unequal use of social insurance benefits: The role of employers. *Journal of Econometrics*.

Bishow, J. L. (2015). The relationship between access to benefits and weekly work hours. *Monthly Lab. Rev. 138*, 1.

Burkhauser, R. V. and M. Daly (2011). *The declining work and welfare of people with disabilities: What went wrong and a strategy for change*. AEI Press.

Card, D., A. R. Cardoso, J. Heining, and P. Kline (2018). Firms and labor market inequality: Evidence and some theory. *Journal of Labor Economics 36*(S1), S13–S70.

Card, D., J. Heining, and P. Kline (2013). Workplace heterogeneity and the rise of west german wage inequality. *The Quarterly journal of economics 128*(3), 967–1015.

Currie, J. and B. Madrian (1999). Health, health insurance and the labor market. *Handbook of labor economics 3*, 3309–3416.

De Groot, N. and P. Koning (2016). Assessing the effects of disability insurance experience rating. the case of the netherlands. *Labour Economics 41*, 304–317.

Dworsky, M., S. Rennane, and N. Broten (2022). Earnings losses and benefit adequacy in california's workers' compensation system: Estimates for 2005–2017 injury dates. Technical Report RR-A964-1, RAND Corporation, Santa Monica, CA.

Goldin, C., S. P. Kerr, and C. Olivetti (2020). Why firms offer paid parental leave: An exploratory study. Technical report, National Bureau of Economic Research.

Hawkins, A. and S. Simola (2020). Paying for disability insurance?: Firm cost sharing and its employment consequences. *Opublicerat manuskript https://www. dropbox. com/s/ksgkjkumdtz6ux0/ahss_disability_paper. pdf*.

Hill, M., N. Maestas, and K. J. Mullen (2016, August). Employer accommodation and labor supply of disabled workers. *Labour Economics 41*, 291–303.

Kline, P., R. Saggio, and M. Sølvsten (2020). Leave-out estimation of variance components. *Econometrica 88*(5), 1859–1898.

Kostøl, A. R. and M. Mogstad (2014, February). How financial incentives induce disability insurance recipients to return to work. *American Economic Review 104*(2), 624–55.

Lachowska, M., I. Sorkin, and S. A. Woodbury (2021). Firms and unemployment insurance take-up. Technical report, Working paper.

Liebman, J. B. and J. A. Smalligan (2013). An evidence-based path to disability insurance reform. Technical report, Brookings Institution.

Maestas, N., K. J. Mullen, and S. Rennane (2019). Unmet need for workplace accommodation. *Journal of Policy Analysis and Management 38*(4), 1004–1027.

Moffitt, R. A. and J. Gregory (2022). The return to work in disability programs: What has been learned and next steps. *Lessons from SSA Demonstrations for Disability Policy and Future Research edited by Austin Nichols, Jeffrey Hemmeter, and Debra Goetz Engler*, 135–186.

Monaco, K. (2015). Disability insurance plans: trends in employee access and employer costs.

Murphy, G., J. Patel, L. I. Boden, and J. Wolf (2021). Workers' compensation: Benefits, costs, and coverage (2019 data). Technical report, National Academy of Social Insurance, Washington, D.C.

O'Leary, P., G. A. Livermore, and D. C. Stapleton (2011). Employment of individuals in the social security disability programs. *Soc. Sec. Bull. 71*, 1.

Oregon Department of Consumer and Business Services (2020). Employer at injury program (eaip).

Prinz, D. and B. Ravesteijn (2020). Employer responsibility in disability insurance: Evidence from the netherlands.

Taber, C. and R. Vejlin (2020). Estimation of a roy/search/compensating differential model of the labor market. *Econometrica 88*(3), 1031–1069.

Appendix

Appendix Table 1: ORS Job Tasks Included in Analysis

- Percent of workers, interaction with general public is required
- Percent of workers, workload is controlled by machinery, equipment, or software
- Percent of workers, workload is controlled by numerical performance targets
- Percent of workers, workload is controlled by people
- Percent of workers, workload is self-paced
- Percent of workers, workload is controlled by other external source
- Percent of workers, with the ability to pause work
- Percent of workers, with consistent, generally fast work pace
- Percent of workers, with more than basic people skills
- Percent of workers, required to have verbal interaction constantly, every few minutes
- Percent of workers, problem solving is required once per day
- Percent of workers, with telework available
- Percent of workers, work reviewed by supervisor more than once per day
- Percent of workers, work reviewed by supervisor once per day
- Percent of workers, where supervisor is present
- Percent of workers, supervisory duties are required
- Percent of workers, credentials are required
- Percent of workers, credentials: certification is required
- Percent of workers, credentials: license is required
- Percent of workers, credentials: educational certificate is required
- Percent of workers, credentials: certification is required, with associated time
- Percent of workers, credentials: license is required, with associated time
- Days of credentials: certification (50th Percentile - median)
- Days of credentials: license (50th Percentile - median)
- Percent of workers, credentials: educational certificate is required, with associated time
- Days of credentials: educational certificate (50th Percentile - median)
- Percent of workers, minimum education level is an associate's degree
- Percent of workers, literacy is required
- Percent of workers, minimum education level is a bachelor's degree
- Days of on-the-job training (50th Percentile - median)
- Percent of workers, on-the-job training is required

continued on next page

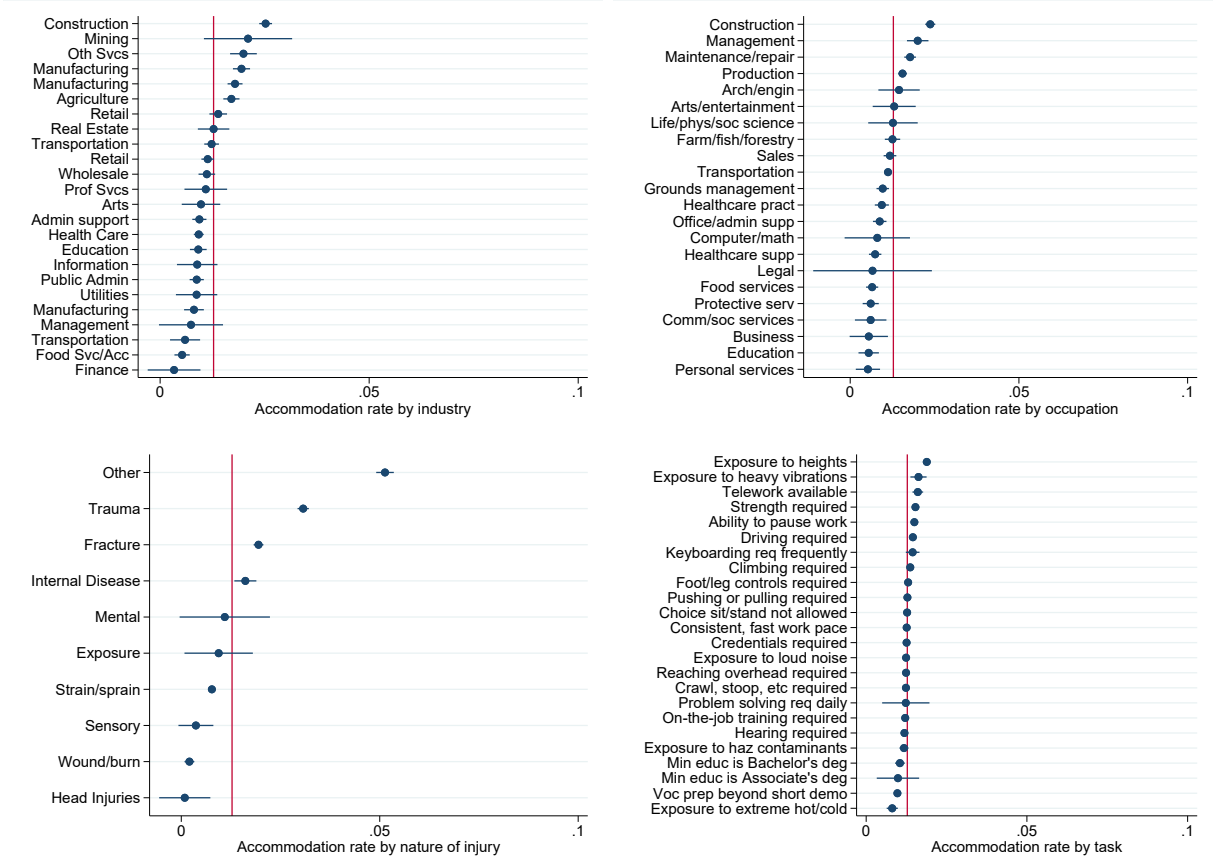
ORS Job Tasks Included in Analysis, continued

- Percent of workers, prior work experience is required
- Days of prior work experience (50th Percentile - median)
- Percent of workers, specific vocational preparation is short demonstration only
- Percent of workers, specific voc prep is beyond short dem, up to and including 1 month
- Percent of workers, specific voc prep is over 1 month, up to and including 3 months
- Percent of workers, exposed to extreme cold
- Percent of workers, exposed to extreme heat
- Percent of workers, exposed to hazardous contaminants
- Percent of workers, utilizing personal protective equipment for hazardous contaminants
- Percent of workers, exposed to heavy vibrations
- Percent of workers, exposed to heights
- Percent of workers, utilizing personal protective equipment for heights
- Percent of workers, exposed to humidity
- Percent of workers, exposed to loud noise
- Percent of workers, utilizing personal protective equipment for noise
- Percent of workers, exposed to outdoors
- Percent of workers, in proximity to moving mechanical parts
- Percent of workers, utilizing PPE for proximity to moving mechanical parts
- Percent of workers, exposed to wetness
- Percent of workers, choice of sitting or standing is not allowed
- Percent of workers, climbing ladders, ropes, or scaffolds is required
- Percent of workers, climbing structure-related ramps or stairs is required
- Percent of workers, climbing work-related ramps or stairs is required
- Percent of workers, driving is required
- Percent of workers, fine manipulation is required
- Percent of workers, foot or leg controls is required
- Percent of workers, gross manipulation is required
- Percent of workers, hearing over the telephone is required
- Percent of workers, hearing other sounds is required
- Percent of workers, hearing speech in person is required
- Percent of workers, hearing other remote speech is required
- Percent of workers, keyboarding is required, frequently
- Percent of workers, keyboarding is required
- Percent of workers, lifting or carrying negligible weight is required, frequently

continued on next page

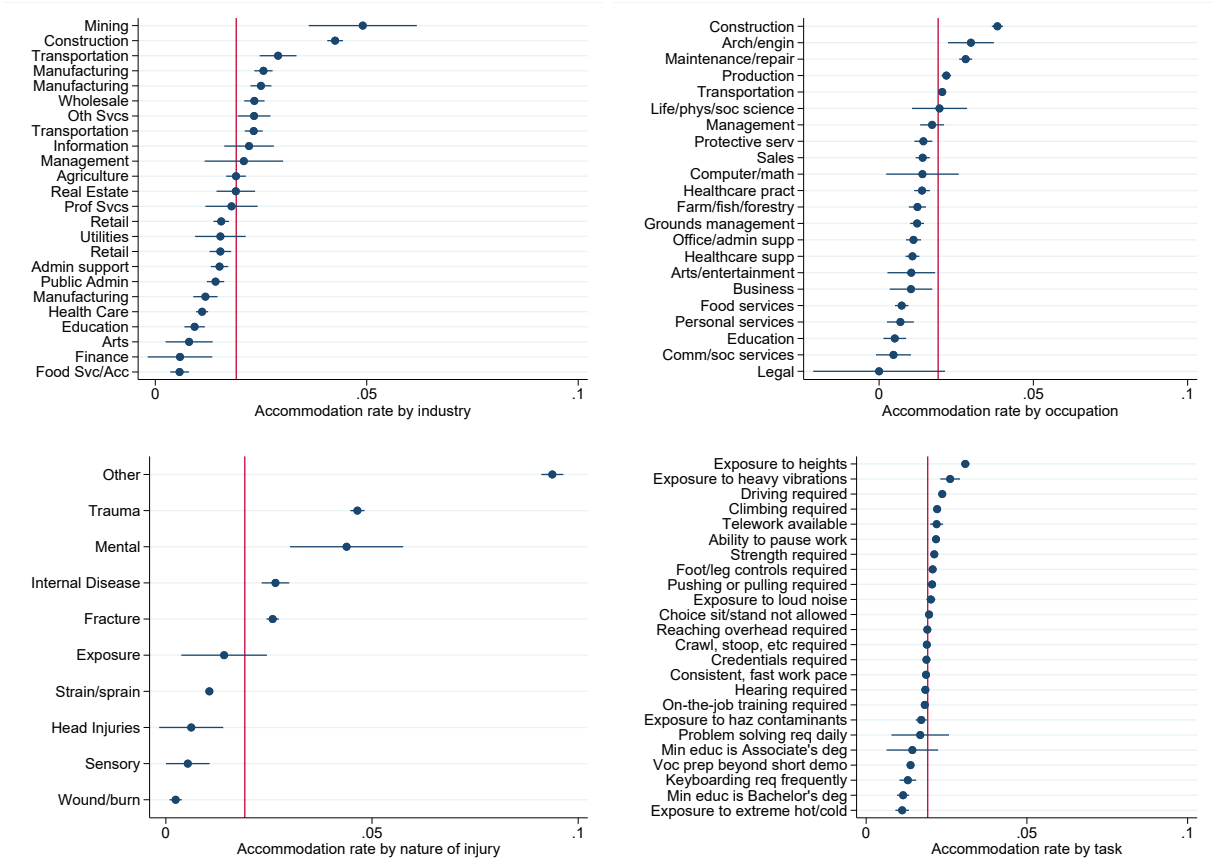
ORS Job Tasks Included in Analysis, continued
- Percent of workers, lifting or carrying > 1 lb and <= 10 lbs is required, frequently
- Percent of workers, lifting or carrying > 10 lbs and <= 25 lbs is required, frequently
- Percent of workers, lifting or carrying > 25 lbs and <= 50 lbs is required, frequently
- Percent of workers, lifting or carrying > 50 lbs is required, frequently
- Percent of workers, lifting or carrying no weight is required, frequently
- Percent of workers, low postures are required
- Percent of workers, crawling is required
- Percent of workers, stooping is required
- Percent of workers, kneeling is required
- Percent of workers, crouching is required
- Pounds maximum weight lifted or carried (50th Percentile - median)
- Percent of workers, pushing or pulling with feet or legs is required
- Percent of workers, pushing or pulling with hands or arms is required
- Percent of workers, reaching at or below the shoulder is required
- Percent of workers, reaching overhead is required
- Hours of sitting (50th Percentile - median)
- Percent of day where sitting is required (50th Percentile - median)
- Percent of workers, speaking is required
- Hours of standing (50th Percentile - median)
- Percent of day where standing is required (50th Percentile - median)
- Percent of workers, strength required is medium work
- Percent of workers, near vision is required
- Percent of workers, far vision is required
- Percent of workers, peripheral vision is required

Appendix Figure 1: Average PWP accommodation rate by industry, occupation, nature of injury, and task



Notes: Data provided by Oregon Department of Business and Consumer Services, 2005-2017. Sample includes disabling claims in Oregon with at least two claims within a firm.

Appendix Figure 2: Average VR accommodation rate by industry, occupation, nature of injury, and task



Notes: Data provided by Oregon Department of Business and Consumer Services, 2005-2017. Sample includes disabling claims in Oregon with at least two claims within a firm.