7

The Impact of Employment Protection on Workers Disabled by Workplace Injuries

Adam H. Gailey and Seth A. Seabury

7.1 Introduction

Employment protection statutes are designed to shield individuals in protected classes from discrimination in the workforce by providing them with legal redress when they face prohibited employer practices. The disabled constitute one such class, and employment protection for disabled workers entitles them to "reasonable" accommodations that allow them to perform necessary job functions and bars discrimination in hiring, termination, or compensation. Presumably, a key goal of offering this protection to the disabled is to improve their earnings and employment opportunities. However, past studies have demonstrated that employment protection, specifically the Americans with Disabilities Act (ADA), has had a negligible or even harmful effect on the labor market outcomes of the disabled (Oi 1991; Rosen 1991; DeLaire 2000a, 2000b; Acemoglu and Angrist 2001; Hotchkiss 2003, 2004; Jolls and Prescott 2004). In this chapter we study how the impact of employment protection differs for a specific subset of the disabled population—those who become disabled as a result of a workplace injury.

One factor that separates the disabled as a class from other protected groups, such as racial or ethnic minorities, is that a nondisabled individual

can become disabled after experiencing an adverse health shock.[1] In particular, a nontrivial fraction of disabilities occur as a result of someone experiencing a workplace injury or illness.[2] This is noteworthy because an extensive regulatory and compensation system already governs workplace injuries and illnesses, and there are a myriad of ways in which these policies might interact with employment protection laws. Due to these interactions, the impact of employment protection on someone disabled at work could differ substantially from that of someone with a prior disability or a non-work disability. This provides a useful opportunity to investigate the impact of overlapping regulatory and litigation-based policies targeting the employment of disabled workers.

This chapter studies how overlap between workers' compensation coverage and employment protection affect the labor market outcomes of the disabled. Central to our analysis is the idea that the accommodations required by employment protection policies can reduce the expected costs associated with workers' compensation benefits that employers must pay to injured workers. This implies that some of the employer costs of complying with the employment protection laws will be offset by lower workers' compensation costs. Thus, policies that protect the disabled from discrimination will be more effective when applied to those workers who become disabled through a workplace injury or illness.

The complementarity of employment protection and workers' compensation is tested using data on employment, disability status, and workers' compensation benefit receipt from the Current Population Survey (CPS). While past studies have primarily studied the impact of the ADA, we focus on the California Fair Employment and Housing Act (FEHA). In many ways FEHA mirrors the ADA, but it actually predates the ADA and offers stronger protections to the disabled. Additionally, the FEHA was revised in 2001 to place stricter requirements on employers to provide accommodations. After this reform, the number of allegations under FEHA that an employer failed to accommodate a disability more than doubled. This provides a natural experiment in which to examine the employment impact of FEHA on the disabled and how the impact differs for those with and without a workplace injury.

Our empirical analysis employs a difference-in-differences strategy that compares the labor force participation of disabled workers' compensation recipients relative to disabled workers without workers' compensation benefits before and after the changes to FEHA. The findings generally support

1. In principle, demographic changes in the ethnic composition of the population can make someone a minority. However, such changes generally occur over relatively long periods of time and far less frequently than people experience health shocks that leave them disabled.

2. Reville and Schoeni (2005) estimate that for people age fifty-one to sixty-one reporting a work-limiting disability, 36 percent of them became disabled due to a workplace injury, illness, or accident.

the predictions of the model. Specifically, we find that the labor force participation of workers' compensation recipients rose relative to that of other disabled workers after the employment protection provisions of FEHA were strengthened. The results appear to be largely driven by male workers, who are more likely to be subject to accommodations. Robustness checks indicate that there was no comparable trend in the employment of disabled workers' compensation recipients relative to other disabled workers outside of California during this time period.

These findings indicate that employment protection can have a positive impact on the labor market outcomes of the disabled, something that the prior literature has failed to demonstrate empirically. However, the effects appear to be limited to certain subgroups of the disabled population, which may help explain why the existing literature finds little effect. From the perspective of social welfare, the enhanced effect of the employment protection laws for workers' compensation recipients could be good or bad. The welfare effects ultimately depend on whether or not the level of accommodation that occurs under the litigation system is socially optimal. If they are, then the additional accommodation for workers' compensation beneficiaries could lead to excess accommodations. On the other hand, if the equilibrium accommodation for workers with nonwork disabilities is suboptimal, then the increase in accommodations for workers' compensation recipients should be welfare enhancing.

In the context of the literature studying the interaction between regulatory regimes and the court system, this chapter provides an example where regulation and litigation appear to be complements.[3] Liability and safety regulation are often—though not always—considered substitutes, suggesting that combining the two could be redundant and lead to inefficiencies.[4] For example, Phillipson and Sun (2008) argue that having dual litigation and regulatory systems in the case of pharmaceuticals leads to significant welfare losses by increasing the cost of prescription drugs without the benefit of increasing safety. While the welfare consequences in our application are still unclear, this chapter provides an empirical example that the combination of regulation and litigation is not always redundant.

The chapter proceeds as follows. In the next section we provide some

3. We take employment protection to be the litigation system and workers' compensation to be the regulation system in our example, because the penalties in employment discrimination cases are often leveled in civil court whereas workers' compensation benefits are prescribed ex ante. In truth, however, there are aspects of employment protection that operate like a regulatory system, and aspects of workers' compensation that operate like a system of litigation. We clarify how our application differs from a traditional model of regulation and litigation (and how this affects the implications of our findings) later in the chapter.

4. Litigation and regulation are not always considered redundant, at least theoretically. Kolstad, Ulen, and Johnson (1990) and Schwartzstein and Shleifer (2009) show how the combination of regulation and litigation can correct inefficiencies in liability or regulation alone, and lead to improved outcomes.

background on employment protection litigation and workers' compensation. In particular, we describe the California FEHA and the changes that were enacted in 2001. In section 7.3 we develop a model that illustrates how the consequences of employment protection for disabled workers can differ depending on whether or not a worker was disabled due to workplace injury. Section 7.4 describes our empirical approach and the data, and section 7.5 presents and discusses our empirical results. The chapter concludes with a brief discussion of next steps and implications for future work.

7.2   Background

This chapter is concerned with the interaction between workers' compensation benefits and employment protection laws targeting the disabled. In each case there is a considerable amount of variation across the United States in the design and scope of both types of policies. In this section we offer a brief discussion of each, with a particular focus on California (which is the subject of our empirical analysis).

7.2.1   Workers' Compensation

In the United States, workers' compensation laws regulate the compensation offered to workers who experience work-related injuries or illnesses. Coverage by workers' compensation is nearly universal: all fifty states and the federal government have some form of workers' compensation system, although it is optional in Texas (and to a lesser extent New Jersey). There is significant variation in the design of state programs, but there are some similarities in the kinds of benefits available to workers. Typically, employers are required to compensate injured workers for all medical expenses, and replace some fraction of lost wages.

The wage loss benefits, also called indemnity benefits, vary depending on whether the injury is permanent or temporary. Generally there are four types of indemnity benefits: temporary total disability (TTD) benefits, permanent partial disability (PPD) benefits, permanent total disability (PTD) benefits and fatality benefits. Most attention is typically paid to TTD and PPD benefits because they are more common by far. The TTD benefits are paid weekly and usually provide approximately two-thirds replacement of the injured worker's preinjury average wage, subject to weekly benefit caps and floors. The structure of PPD benefits varies more substantially, but they are typically determined as some function of the nature and severity of a worker's disability. All workers' compensation benefits are exempt from income tax, so the after-tax replacement rate of lost income can be significantly higher than the before-tax rate.[5]

5. For example, Viscusi and Moore (1987) estimated that that the before-tax replacement rate was 55 percent, compared to 83 percent after taxes.

In California, the maximum TTD benefits have changed over time. This fact is relevant for our empirical analysis, as we discuss in detail later. From July 1, 1996 through December 31, 2002, the maximum benefit was fixed at $448 per week. In 2003, 2004, and 2005, the maximum weekly benefit increased by approximately $120 per year.[6] Beginning in 2007, weekly benefits have been adjusted annually according to a cost-of-living adjustment (COLA) based on the state average weekly wage. Minimum benefits were fixed at $126 per week over this time period, though beginning in 2007 they, too, are adjusted by the COLA.

In California, temporary benefits are paid until a worker goes back to work or until a physician determines that the worker is no longer improving (i.e., the doctor declares their condition to be "permanent and stationary"). If they suffer residual impairment as a result of their injury, they will generally be eligible for PPD benefits. California PPD benefits are determined according to a schedule that assigns a disability rating (from 1 to 100) to injured workers based on the body part that was injured, the severity of the resulting impairment to the function of the body part, as well as the age and occupation at the time of the injury. The maximum benefits for PPD are determined in part by the disability rating, but they are generally much smaller than TTD benefits (almost always less than $300 per week).

For our purposes, an important distinction between TTD and PPD benefits in California is that only TTD benefits are dependent on current labor force participation. The PPD benefits are the same regardless of whether or not an employee is currently employed.[7] Thus, from the standpoint of thinking about how accommodating an injured worker and bringing them back to work early might affect workers' compensation costs, only TTD benefits are truly relevant.

7.2.2   Employment Protection for the Disabled

Probably the best known policy that protects the disabled from discrimination in the U.S. is the ADA. The ADA was enacted in 1991, but Title I, which provided employment protection for workers at employers with twenty-five or more employees, did not become effective until July 1992. In addition to explicitly barring discrimination in hiring, firing, promotion, pay, or other employment practices, the ADA also requires employers to provide "reasonable" accommodations to the worksite for disabled workers or prospective workers. These may include but are not limited to:[8]

---

6. Specifically, the weekly benefits rose to $602 in 2003, $728 in 2004, and $840 in 2005.
7. Starting in 2006 the law was changed to implement a tiered benefit structure that reduced PPD benefits if employers make an offer of return to work, and increased them if they did not. However, this difference was contingent entirely on the offer of return to work, and the levels do not change regardless of whether the employee accepted the job or accepted employment somewhere else.
8. These examples were provided by the Equal Employment Opportunity Commission, at http://www.eeoc.gov/types/ada.html, accessed on August 31, 2008.

- Making existing facilities used by employees readily accessible to and usable by persons with disabilities.
- Job restructuring, modifying work schedules, reassignment to a vacant position.
- Acquiring or modifying equipment or devices; adjusting or modifying examinations, training materials, or policies; and providing qualified readers or interpreters.

More generally, the ADA requires employers to provide accommodations that do not constitute an "undue hardship" on their operation.

While the ADA is perhaps the most widely known policy, it is not the only or even the first. There are many state policies, some of which predate the ADA. One example of this is the California Fair Employment and Housing Act (FEHA). The FEHA protects individuals against harassment or discrimination in employment and housing because of a disability and numerous other characteristics, including age, gender, race, and religion.[9] The FEHA was first passed in 1959 and has changed many times over the years, but laws preventing discrimination against the disabled began to be incorporated in the 1970s.

Under FEHA, employers are required to provide reasonable accommodations to employees with disabilities in order to enable them to perform their essential job functions, just as under the ADA. As part of this requirement, employers are required to participate in an "interactive process" with their disabled employees to determine if reasonable accommodations can be made that would allow the employee to continue working. In 2001, California revised the FEHA through Assembly Bill 2222 (AB2222).[10] The AB2222 expanded FEHA's broad definition of disability and it clarified that mitigating measures (such as medications or devices such as glasses) are to be excluded from disability determination.

The FEHA in California also provides for a definition of disability more encompassing than does the ADA and most other states. The FEHA provides protections for individuals with a "limitation" on a major life activity while the ADA and many states only a "substantial limitation." Also, the FEHA does not allow mitigation measures to be considered in the definition of disability, and extends protections to smaller businesses than does the ADA. The FEHA provides for higher potential damage awards than does the ADA and most other states. In almost every dimension the FEHA provides greater protections to a broader range of disabled persons than does nearly every other state. Some of the differences in definition of disability were removed in the Americans with Disabilities Act Amendments Act of 2008. Among other things, the act no longer allows for mitigation measures

9. Fair Employment and Housing Act (Title 2, Division 3, Part 2.8).
10. AB 2222, Chapter 1049, Civil Code sections 51, 51.5, 54, and CA Government Codes 12926, 12940, 12955.3, and 19231.

other than glasses/contact lenses to be considered in the determination of disability status.

The most important aspect of FEHA for this chapter is the change brought about by AB2222 that enhanced employers' responsibilities for initiating an interactive process with disabled employees. Essentially, after AB2222, if an employer fails to engage in an interactive process this can serve as sufficient grounds for a cause of action against the employer. While the ADA requires a similar process, it is not sufficient to show liability on its own. Obviously a worker would still have to show harm in order to recover any damages, but making the failure to engage sufficient grounds for a lawsuit substantially increases the access of disabled workers to the court system (as we demonstrate later). To our knowledge, this provision of FEHA makes California one of the most, if not the most, aggressive states in terms of requiring employers to accommodate disabled workers.

7.2.3   When Do Employment Protection Laws and Workers' Compensation Overlap?

Ostensibly the two systems just described target completely different issues. However, both are intensely concerned with the employment outcomes of someone after they experience a workplace injury. A failure to return injured workers back to work in a timely fashion will lead to both higher workers' compensation benefits and could increase an employer's exposure to antidiscrimination litigation. This is the key relationship between the two programs for our purposes, because it suggests that accommodating disabled workers in accordance with employment protection laws can reduce the amount employers have to pay in workers' compensation benefits.

The intuition behind this prediction is that accommodations that make it easier for a disabled worker to perform their duties also make it easier for workers to return to work at an earlier date. Such accommodations might include modifying the set of tasks so as to avoid particularly physical work, or some kind of worksite or physical modification. We do not necessarily think that these accommodations affect the actual recovery time of disabled workers. Rather, we argue that workers have the ability to modify the date at which they return to work, and by taking extra steps to accommodate workers, employers can accelerate that date.

There is some empirical support for the idea that accommodations will reduce the employer costs of workplace injuries. It is clear that workers have some ability to choose when to return to work, as shown by numerous studies finding that the duration of work-injury absences is positively related to the benefit level (c.f., Meyer, Viscusi, and Durbin 1995; Neuhauser and Raphael 2004; Kruger 1990; Galizzi and Boden 1996; Butler and Worral 1985; Johnson and Ondrich 1990). The direct evidence on the effect of accommodations is limited, but there is some evidence from past studies that employer return to work programs reduce the time out of work (c.f., Butler,

Baldwin, and Johnson 1995; Loisel et al. 1997; Bernacki et al. 2000; Krause, Dasinger, and Neuhauser 1998). These programs typically involve modifications to work tasks, equipment, or scheduling, all of which are items that may be required by the employment protection policies.

Another, potentially more direct, way in which workers' compensation and employment protection statutes for the disabled might interact is through second injury funds (SIFs). These were created as a means to encourage the hiring of disabled workers by alleviating employer concerns that workers with preexisting conditions might exacerbate the likelihood or severity of a future injury. The SIFs operate by either reimbursing employers (or insurers) for payments made to eligible claims or by simply appropriating the claim and making the payments directly. In this sense, SIFs and employment protection have similar implications for the employment of the disabled: SIFs offer incentives to reduce discrimination against disabled workers, whereas employment protection policies offer legal protection if discrimination is thought to have occurred. However, it is possible that SIFs offer additional protection to disabled workers by reducing the incentives of employers to challenge claims on the basis of compensability.[11]

As discussed in Uehlein and Nevils (2008), since the adoption of the ADA many states have begun to close their SIFs, under the argument that the protections provided against discrimination make the funds redundant. This potentially could increase the degree of overlap between employment protection and workers' compensation cases, because employers will face greater workers' compensation costs associated with disabling injuries related to preexisting conditions. In California there is the Subsequent Injuries Fund, which covers approximately 500 claims a year at a cost of approximately $6.5 million.[12] However, the provisions of the fund did not change significantly around the time of the changes to FEHA that we use in our empirical test, so we do not think it affects our identification. Nonetheless, the elimination of SIFs could have important implications for the overlap between workers' compensation and employment protection for workers in affected states such as New York and Florida.

In a typical study of the relationship between regulation and litigation, the overlap between the functions of the two systems is more direct than is the case here. The regulatory system requires a certain type of behavior and imposes fines and penalties for deviation from that behavior (if the deviation is detected). Litigation provides a means for individuals to recover com-

11. Under a SIF, employers have no incentive (or reduced incentives) to contest a workers' compensation claim for a worker with a preexisting condition on the basis of causality. This is not the case with employment protection, in that employers have just as much (if not more) incentives to contest compensability. We thank Richard Butler for suggesting this implication of SIFs.

12. This information is available from the California Division of Workers' Compensation (DWC) at http://www.dir.ca.gov/DWC/basics.htm (accessed October 15, 2009).

pensation if they are harmed as a result of behavior that deviates from the "reasonable" level set by the courts. In our case, the workers' compensation system is not a true ex ante regulatory system. Rather, it indirectly regulates accommodations by imposing a penalty (disability benefits) on employers when they fail to accommodate injured workers. This will be important to note when we discuss the policy implications of our findings.

7.3   Conceptual Framework

Previous studies of the impact of employment protection on labor market outcomes for the disabled have tended to focus on the aggregate employment and wage effects. For instance, Acemoglu and Angrist (2001) develop a model of the labor market for disabled workers and use it to show that the theoretical impact of the ADA on employment is ambiguous. While the ADA subsidizes hiring costs that should promote the employment of the disabled, it simultaneously imposes ex ante expected costs to firms hiring disabled workers by raising the costs of firing them.

However, while the general equilibrium effect of their model is to reduce employment, Acemoglu and Angrist acknowledge that the partial equilibrium effects could be much different. In particular, by increasing firing costs and requiring accommodation, the ADA could increase retention of already employed workers who become disabled due to a health shock. This is important for our purposes, because we hypothesize that the primary impact of the overlap between employment protection and workers' compensation receipt should be on the retention of newly disabled workers.

In this chapter, we argue that the existence of the workers' compensation system reinforces this retention effect for those workers who become disabled due to a workplace injury. Suppose that individual i is employed and has marginal productivity equal to θ_{it}, where $\theta_{it} = \theta^D$ if she is disabled in time t and $\theta_{it} = \theta^H$ if she is not. The disabled are assumed to be less productive in most jobs, so $\theta^H \geq \theta^D$. In a fully competitive market, wages would equal marginal product. However, suppose there are equal pay provisions that prevent employers from offering different wages based on disability status, so $w_i = \overline{w}$ for all i regardless of marginal product.[13] If we assume that $\theta^H > \overline{w} > \theta^D$, we have the extreme case where a firm always wants to hire nondisabled workers but never wants to hire disabled workers.

The Acemoglu and Angrist (2001) model generated turnover by incorporating exogenous productivity shocks for all workers. In our model, the only shock we consider is a nondisabled worker becoming disabled. Suppose that each nondisabled worker in period t faces the chance of becoming disabled

13. In this model we ignore the possibility that employers could differentiate job title or description based on disability status, which might give them some ability to alter wages. However, such practices could similarly run afoul of provisions that prohibit discrimination in promotion or hiring.

in period $t + 1$. For simplicity, assume that disability is an absorbing state. Once a worker becomes disabled, the employer has two choices: they can pay accommodation cost c and retain the disabled worker, or they can fire the disabled worker and absorb the associated litigation costs, denoted f.[14] The firing cost is equal to the expected cost that comes from a lawsuit that the disabled worker files under the employment protection provisions. Firing cost is assumed to be nonzero and randomly distributed with a density function $g(f)$.

In our model, the value of accommodation changes depending on whether or not the worker became disabled due to a workplace injury. If the injury occurred at work, the worker is eligible for income replacement benefits during the recovery period. This cost, which we denote b, cannot be avoided by firing the worker. However, benefits are paid weekly, so the cost is increasing in the length of time that an injured worker remains out of work. For the reasons discussed earlier, we assume that the time out of work—and thus the cost associated with workers' compensation benefits—can be reduced by making the accommodations; that is, $b(c) < b(0)$.

Under these assumptions, an employer will retain the newly disabled worker if:

$$\theta^D - \overline{w} - c \geq -E(f) \qquad \text{for nonwork disabilities}$$

$$\theta^D - \overline{w} - c + (b(0) - b(c)) \geq -E(f) \quad \text{for work-related disabilities.}$$

If $\overline{w} > \theta^D$, then employers always fire disabled workers in the absence of employment protection. Similarly, if employment protection requires accommodations without an adequate enforcement mechanism, such as the ability to sue the employer, employers would still choose to fire workers and not accommodate. However, if the firing costs are high enough, employers will find it profitable to retain disabled workers even if their marginal product is below the required wage.

The ability of accommodation costs to offset workers' compensation costs, as represented by $(b(0) - b(c))$, makes it cheaper for employers to retain disabled workers.[15] Essentially, this acts as a subsidy to complying with the guidelines of employment accommodation. This implies that employment protection and workers' compensation recipiency are complements: the threat of a discrimination lawsuit should have a bigger effect among workers' compensation recipients than nonrecipients.

This hypothesis about the differential impact of employment protection on workers' compensation recipients and nonrecipients motivates our empirical work. In order to test the predicted relationship, the ideal experiment

---

14. Implicitly we are assuming that marginal productivity of disabled workers is θ^D if the employer accommodates and zero otherwise.

15. We rule out the case where $(b(0) - b(c)) > c$. In such a scenario, employers could choose to accommodate and still fire the disabled workers.

would be to observe the employment of workers' compensation recipient compared to nonrecipients with and without any employment protection. However, our empirical test is implemented somewhat differently.

We do not observe a state of the world with no employment protection; rather, we observe employment outcomes before and after a random shock to the strength of employment protection. This can be interpreted in our model as a change in the distribution function $g(f)$, one that leads to an increase in the expected costs of firing a disabled worker. This is an important distinction, because the change in the differential impact of employment protection is not generally equal to the overall difference; in fact, it need not even have the same sign.

Figure 7.1 illustrates the impact of a hypothetical change in the distribution of firing costs on the expected employment of disabled workers. The functions $g^1(f)$ and $g^2(f)$ represent the distribution of firing costs before and after the change, respectively. The probability a worker is retained for a given value of f is the integral of $g(f)$ above that value. The values f^* and f^{wc} represent the respective firing cost thresholds that induce employers to retain workers with nonoccupational and occupational disabilities.

The area B represents the differential impact of employment protection on workers' compensation recipients before the change. After the change the differential impact is the area $A + B$. However, the experiment implemented in the empirical work in this chapter can only identify area A, the difference-in-differences after the change. While A is positive in our example, it is easy
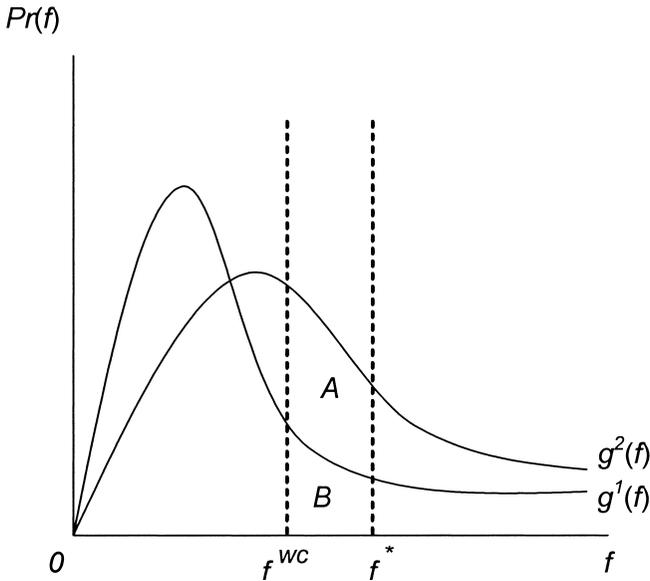

Fig. 7.1   The impact of a change in the distribution of firing costs

to see that this is not necessarily the case. Practically speaking, *A* will be positive as long as the change in the distribution of firing costs is large enough and as long as the threshold values are not too low. If firing costs are low enough before the change, so that area *B* is small, then the difference identified here will approach the full differential impact of the policy after the change.

7.3.1   Welfare Implications

A natural question that arises in our analysis is, does the result that workers' compensation and employment protection are complements lead to more socially desirable outcomes? The model suggests that workers who become disabled due to a workplace injury will receive greater accommodations and experience better employment outcomes. While this is clearly better for the workers' compensation recipients, it is not immediately clear whether or not it is socially optimal.

An ideally functioning system would have employers providing the optimal level of accommodations to both groups of workers. The complementary nature of employment protection and workers' compensation could improve social welfare in one of two ways. If we thought that employers were more likely to discriminate against workers' compensation recipients, then the implicit subsidy to accommodation could lead to more efficient outcomes.[16] Alternatively, suppose that inefficiencies inherent to the liability system (such as the high cost of filing a lawsuit) leads to inefficiently low levels of accommodation for all disabled workers. In this case, providing employers with additional incentives to accommodate workers' compensation recipients leads to better outcomes. Note that these two have significantly different policy implications. With the former, the optimal policy prescription would be to find some way to subsidize accommodations for all disabled workers. With the latter, no such intervention is (necessarily) called for.

From a social perspective, it is also possible that the complementarity between workers' compensation and employment protection actually worsens social welfare. As is the case with many applications of the tort system, the welfare implications of the analysis relies crucially on the ability of the courts to identify the socially optimal level of accommodation. If the true impact of employment protection is to impose an overly burdensome cost to employers, then anything that leads to higher accommodations could lead to a net decline in welfare. Such employer costs could also be exacerbated if the enhanced opportunity for discrimination litigation led to an increase in workers' compensation claims by injured workers.[17] Unfortunately, nothing in our empirical work allows us to identify the actual welfare conse-

---

16. This could happen if, for example, employers discriminated against workers' compensation recipients in order to retaliate against them for filing claims.

17. In our sample, we found no evidence that the rate of workers' compensation claims changed after the changes to FEHA were introduced.

quences of workers' compensation receipt and employment protection in our setting.

7.4   Empirical Approach and Data

In order to test the predictions of the aforementioned model, we need to be able to track workers over time, and observe whether they are disabled, employed, or receive workers' compensation. We also need to observe an exogenous shock to the costs associated with a failure to accommodate injured workers, and observe how this alters employment of the two groups. Because we are focusing on a policy change in California, we also need to be able to measure these things for workers by state.

The primary source of data that we use is the March Current Population Survey (CPS). The CPS includes information on employment outcomes, demographics, state, disability and health status, and workers' compensation benefit receipt. For a subsample of the population, it is possible to match observations across two years, allowing us to study changes in labor force participation. Additionally, the CPS is a relatively large database, allowing us to obtain reasonable sample size even though we focus on a single state.

Our main outcome of interest is the post-disability employment of workers. Because our model specifically considers changes in separation rates from employers, we need to know if the worker was employed in the initial period. Because the matched CPS sample has two periods of data, we limit our sample to people who are employed in the first period and then use employment in the second period as our primary outcome measure. Employment in both periods is defined as having reported working at least one week in the year.

The key policy change for us is the revision to the FEHA in 2001,[18] which we interpret as an exogenous increase in f. The empirical hypothesis that we are testing is that the impact on employment should differ according to whether or not a disabled worker receives workers' compensation benefits. This lends itself to a difference-in-differences specification. The differences we employ are: pre- and post-introduction to the reform, with and without workers' compensation benefits, and disabled versus not disabled. The estimating equation we employ is:

$$\begin{aligned}
\text{Employed}_{it+1} = {} & \beta * x_{it} + \gamma_t + \alpha * \text{disabled}_{it} + b * wc_{it} + \omega * \text{disabled}_{it} * wc_{it} \\
& + \delta * \text{disabled}_{it} * \text{post}_{it} + \eta * wc_{it} * \text{post}_{it} \\
& + \boldsymbol{\theta * \text{disabled}_{it} * \text{post}_{it} * wc_{it}} + \rho * \text{disabled}_{it+1} + \varepsilon_{it+1}.
\end{aligned}$$

In the model, x represents important demographic characteristics such as age, gender, and education; γ represents the impact of time trends (which

18. While the change was enacted in 2001, for reasons discussed in detail later, we actually do not think the change had much effect until 2002.

we implement as year fixed-effects); *wc* represents an indicator for workers' compensation receipt; *disabled* is an indicator for disability status; and *post* is an indicator for the time period corresponding to the post-reform period. The parameter θ identifies the effect of FEHA on people who were disabled and who received workers' compensation benefits. If the interaction of workers' compensation and employment protection increases the likelihood that a worker is retained then the expected sign of this coefficient is positive.

In order for θ to be identified in our model, we need to ensure that we capture the impact of the changes to FEHA and not some other factor that occurred around the same time, such as changes to the workers' compensation system. In fact, as discussed before, there were changes to the workers' compensation law in California that increased the level of TTD benefits paid to injured workers beginning in 2002. This is potentially a matter of concern, but we do not think that this confounds our results because: (a) we do not think that it should have had a different effect for disabled or non-disabled workers' compensation claimants (meaning, any effect should be picked up by the other terms in our difference-in-differences specification); (b) we have a separate control for the replacement rate of disability benefits, which should capture much of the relevant variation from the benefit change; and (c) the effect of a benefit increase actually works against our predicted effect—if benefits increase, the labor supply of workers' compensation claimants should fall—suggesting our results could be conservative.

There were other reforms that led to other changes in California, cutting PPD benefits and replacing vocational rehabilitation with a voucher program. These changes did not take effect until 2004 or later, however. To further verify that we are isolating the impact of changes to FEHA, we break our estimated effects down by year and replicate our analysis dropping years 2004 and later.

To implement this analysis, there are several key measurement issues that must be considered. First, we are basing our test off the assertion that the changes brought about by AB2222 significantly increased the expected costs associated with releasing a disabled worker. It is important to both (a) verify that AB2222 did increase firing costs associated with a failure to accommodate and (b) pinpoint when these increased costs started to arise. Second, we must settle on an appropriate definition of disability. Finally, there are some issues typically associated with matching the CPS data across years. We discuss each of these issues in turn.

7.4.1   Measuring the Timing and Effect of the Reforms

To investigate whether or not the changes to the FEHA increased incentives to firms to perform interactive processes, we acquired micro-level data from the California Department of Fair Employment and Housing (DFEH). The DFEH is the administrative body charged with overseeing

the implementation of FEHA. In order to have a right to sue under FEHA, for disability or other types of discrimination, a complaint must first be filed with the DFEH. These data are collected for everyone alleging an act of discrimination, regardless of whether the DFEH is involved in the resolution, or if the claim is litigated.

We received data from DFEH on all claims alleging discrimination on the basis of disability, gender, or race or ethnicity from 1997 through 2007. These data contain both the basis for the claim (gender/race/disability) as well as the alleged acts for the claim (refusal to hire/refusal to accommodate, etc). We received data on 107,703 total claims, of which 32,923 (approximately 31 percent) involved alleged discrimination on the basis of disability. Of the disability claims, 11,790 (approximately 36 percent) alleged a failure to accommodate by the employer. In addition to the data from the DFEH, we retrieved data on the number of charges made at the federal level to the EEOC for employment discrimination from 1997 to 2007.[19] Of the 82,792 charges to the EEOC in 2007, 17,734 (21.4 percent) involved a claim of discrimination due to disability, substantially less than equivalent percentage in California.

Figure 7.2 illustrates the trends in the growth in the number of both California and Federal discrimination claims by basis of claim from 1997 to 2007. The vertical axis represents the percent change between the number of claims reported in the current year and in the baseline year (1997). As we can see, the number of claims in California alleging discrimination for nondisability bases displays a declining trend over time. In particular, there is a noticeable decline after 2003, with the total number of claims in 2007 declining approximately 25 percent from its 1997 level. This trend stands in sharp contrast to the growth in the number of disability discrimination claims in California over the same period. The number of disability claims displays a small amount of growth from 1997 to 2000, but there is a sharp increase in 2001 and then even more in 2002, until the trend levels off. By 2007, the total number of disability discrimination claims in California was approximately 62 percent higher than the number in 1997.

In Figure 7.3 we examine the growth in the number of Federal discrimination claims reported to the EEOC over the same period. The overall setup of the figure is identical to that of figure 7.2. It is clear from the figure that there is little or no comparable trend in Federal discrimination cases over the same period. Federal claims alleging discrimination for nondisability bases show a brief increase in 2002 with a slight decline thereafter. Federal disability claims actually drop steadily between 1997 and 2005, declining as much as 18 percent in 2005. There is an increase after that that brings the total number back very close to that in the baseline year (down approximately 2 percent in 2007).

19. See http://www.eeoc.gov/stats/charges.html, accessed August 12, 2009.
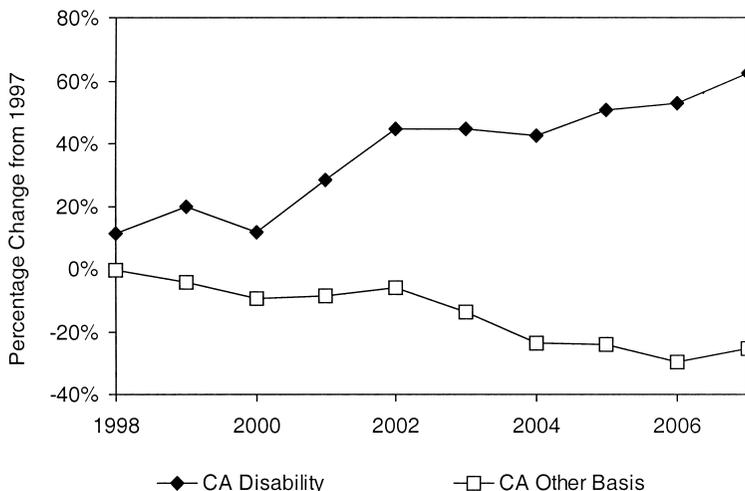
Fig. 7.2   Percentage change in discrimination claims in California by basis of claim, 1997–2007
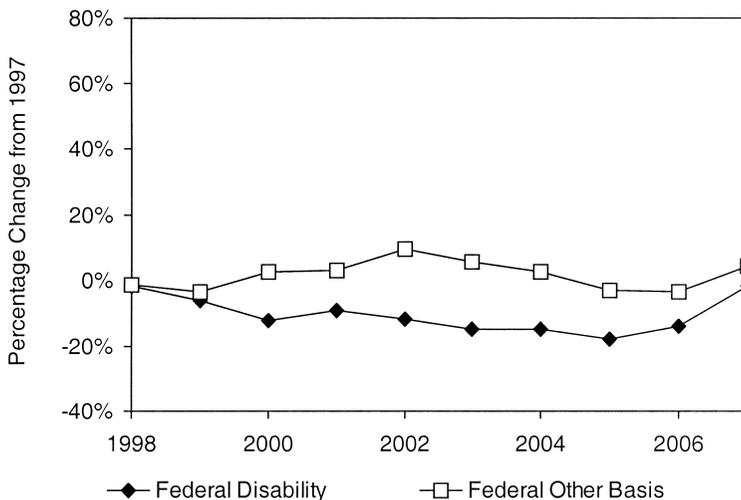
Fig. 7.3   Percentage change in federal discrimination claims by basis of claim, 1997–2007

Our analysis is predicated on the idea that the changes brought about by AB 2222 make it easier to allege that an employer failed to reasonably accommodate a disability. In figure 7.4 we compare the changes in the number of claims alleging a refusal to accommodate to changes in the number of other types of disability claims. As with figure 7.2 and figure 7.3, the values are measured as percent difference from the baseline year (1997). The series
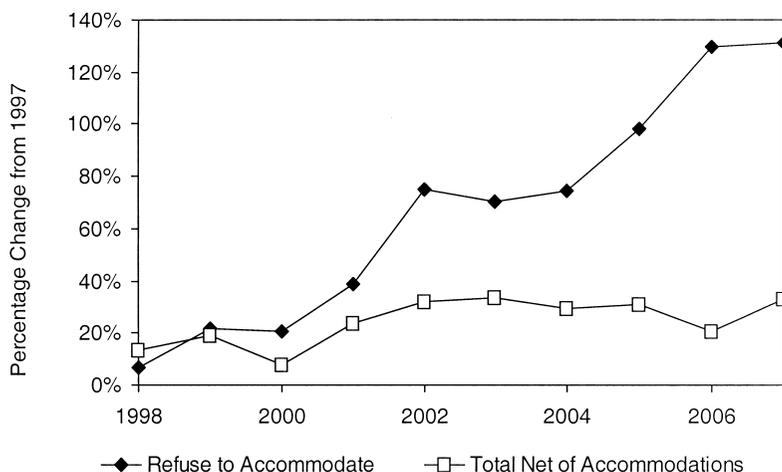
Fig. 7.4   Change in the number of disability claims in California by basis for claim, 1997–2007

"Total Net of Accommodations" represents changes in disability discrimination claims that did not allege any failure to accommodate.

The figure illustrates that a majority of the growth in disability discrimination claims after AB2222 was, indeed, driven by allegations of refusal to accommodate. The number of claims alleging a refusal to accommodate jumped from approximately 21 percent greater than the baseline value in 2000 to 39 percent greater in 2001 to 75 percent greater in 2002. Moreover, this change persists throughout subsequent years, with an additional spurt of growth in 2005 and 2006.[20] In 2007, the number of claims alleging a refusal to accommodate was 131 percent higher than in 1997. However, while there was growth in the number of other types of disability allegations over this time period, the growth is both less pronounced and less persistent.

These figures help support two points that are critical to our analysis. The first point is that AB2222 did lead to a significant increase in claims for disability discrimination. Not only do we see an increase in disability discrimination claims after AB2222 passes, but the trend appears to be mostly uncorrelated with any general trend in the filing for discrimination claims at the state or federal level. This suggests that employers likely did view the change as increasing the likelihood of being sued. Second, the changes were not immediate, and did not appear to take full effect until at least several

20. This latter period of growth may be due to changes in the workers' compensation, particularly the repeal of vocational rehabilitation benefits. A key part of the vocational rehabilitation system was the vocational rehabilitation counselor, the job of whom was generally seen to be consistent with engaging workers in an interactive process. The absence of a vocational rehabilitation counselor may have helped spur an additional increase in the number of refusals to accommodate claims.

months had passed. Therefore, in our empirical work, we focus on before 2001 and after 2001 in our analysis (essentially treating 2002 as the year of enactment).

7.4.2   Defining Disability Status

An important empirical challenge facing many studies that center on the labor market outcomes of the disabled is finding an appropriate measure of disability status to use. Many surveys include questions about the work limitations of individuals. The relevant question in the CPS is:

> (Do you/Does anyone in this household) have a health problem or disability which prevents (you/them) from working or which limits the kind or amount of work (you/they) can do?

While economists are often required to rely on self-reported information, self-reported disability can be problematic in labor market studies because of the possibility that reported disability status is influenced by labor force participation. For example, if one is working, they may be less likely to report having a disability even if they have some form of functional limitation.

Reporting biases in disability status have been shown to have a significant impact on past work. Hotchkiss (2003, 2004) argues that the results of past studies suggesting that the ADA led to worse employment outcomes for the disabled in fact reflected changes in the propensity of individuals to report being disabled. Nonparticipants in the labor force became more likely to claim that they were disabled after the adoption in ADA, possibly in response to concurrent changes in welfare laws and more generous disability benefits. The potential for such bias is troubling for our purposes because we are focusing on individuals who are working (at least in the first period).

To avoid the possibility reporting biases, we use self-reported health status as an alternative definition of disability for our analysis.[21] We define someone as being disabled when they respond as having fair or poor health. While we are still relying on a self-reported measure of health limitations, because the question does not directly ask about employment the answer is more likely to be independent of current labor force participation. However, having fair or poor health is very highly correlated with self-reported disability status (approximately two-thirds of those reporting fair or poor health also report having a work limitation), so we think it captures the relevant variation in the ability to work.[22]

---

21. In this case, the relevant question we use is: "Would you say (name's/your) health in general is Excellent, Very good, Good, Fair, Poor?"

22. In the appendix we show that if we adopt the more standard definition of disability we obtain similar effects, in the sense that they have the predicted sign, though they are smaller in magnitude and not statistically significant.

7.4.3   Matching the CPS Data

While the CPS is not a true panel, portions of the sample can be linked across years. This approach has been used in past studies of workers' compensation (Krueger 1990) and employment protection (Acemoglu and Angrist 2001). About one-half of the CPS population for a particular year can be matched to the next year. A limitation to matching is that because it is a household survey, actual individuals are not identified. Rather, respondents are identified by their household and their place within the household. However, this can differ from year to year due to changes in the makeup of households (this can happen because of death, change in marital status, etc.).

The CPS contains a number of demographic characteristics that can be used to increase the accuracy of the match (such as age and gender). We initially match on household ID and line number. Next, we make sure that the potential match has not changed gender or race/ethnicity. Lastly, we make sure that the potential match is one year older in the second year than they were in the first year. This matching strategy results in a match rate of approximately 40 percent. While lower than the highest possible match rate of 50 percent, it leaves us confident that those people we have matched across years are very likely the same person.

Table 7.1 compares the matched sample to the entire CPS sample for California from 1996 to 2007. Note that we restrict the sample to the twenty-one to fifty-five age population, to focus on the prime labor market years. Overall, the matched sample appears quite close to the overall full sample. The percent of disabled workers is approximately 8.8 percent in the full sample and in the matched sample. The population with workers' compensation is

Table 7.1	Comparison of matched and unmatched CPS samples		
		Matched	
Characteristic	Unmatched	All workers	Disabled workers
Age	37.46	38.85	42.76
Male	49.95%	49.53%	46.17%
Employed	81.84%	83.06%	55.73%
High school	23.38%	22.41%	26.87%
Some college	21.50%	22.04%	19.76%
College degree	36.91%	38.99%	22.98%
White only	77.58%	79.80%	76.30%
Black only	6.90%	5.93%	9.94%
Other minority	15.52%	14.28%	13.76%
Disabled	8.75%	8.81%	
Workers' compensation	1.51%	1.63%	5.51%
Number of observations	98,959	38,417	3,413

Table 7.2   **Changes in disability status from first to second year, matched CPS sample**

	Second year	
First year	Not disabled	Disabled
Not disabled	94.20%	5.80%
Disabled	54.08%	45.92%

1.51 percent in the entire sample and a slightly higher 1.63 percent in the matched sample. All other demographic variables are within a percentage point or two in the entire versus matched sample.

The final column of the table provides summary statistics for the disabled population in the matched sample. As we expect, employment outcomes for the disabled are substantially worse than for the general population. In particular, the employment rate for the disabled population is 55.73 percent, compared with 83.06 percent for the full sample. The rate of workers' compensation receipt is 5.51 percent among the disabled, significantly higher than among the nondisabled population.

Before moving on to discuss the empirical results, we first consider the transitions from health status between years. Table 7.2 illustrates the reported disability status in the second period for matched individuals based on their reported disability status in the first period. Someone who is not disabled in the first period becomes disabled in the second period about 5.8 percent of the time. On the other hand, someone who is disabled in the first period reports a disability in the second period just 45.92 percent of the time. This indicates that over half of reported disabilities are temporary.

This point is of interest partly because it confirms our earlier argument that disability is far from static for most people, but it also has implications for our analysis. Disabilities can vary in terms of their severity as well as their persistence over time. Obviously the employment consequences of a disability will be driven in part by disability severity. What could be problematic for our purposes is the possibility that disabilities associated with workplace injuries are systematically different in terms of severity than other disabilities. We control for this partly with our difference-in-differences specification, which should eliminate any systematic differences between workers' compensation and other disabling injuries that are constant over time. However, we further control for differences in disability severity by including the reported disability status in the second period as an independent variable in all of our analyses.[23]

23. In principle, we could include the full set of self-reported health outcomes in the second period. We have experimented with this and it did not significantly change our findings.

7.5   Results

Table 7.3 reports our central estimates for the differential employment effect of employment protection for workers' compensation recipients. The top panel reports results for all workers in our estimation sample, while the bottom panel reports results for men only.[24] We report results for three specifications: one with no fixed effects, one with fixed effects for county, and the other with fixed effects for the occupation of the job reported in the first period. We estimate a linear probability model, so the coefficients can be interpreted as percentage point differences. The other dependent variables in this model, and all other subsequent models, include controls for age, gender (in the model with both males and females), race, ethnicity, education, wage in the first year, the after-tax replacement rate of lost income from the workers' compensation system,[25] and year fixed effects.[26] Robust standard errors are reported, with clustering at the level used for the fixed effect.[27]

The results of table 7.3 indicate that the adoption of AB2222 significantly increased the likelihood of employment in the second period for disabled workers who received workers' compensation in the first period relative to those who were disabled and did not receive workers' compensation. Ignoring the models with fixed effects, the difference is 0.355 for the full sample and 0.542 for the sample that just includes men. The results are very consistent across the different fixed-effects specifications.

We suspect that the difference is higher for men because, on average, they are more likely to be employed in physical jobs that may be more likely to require accommodation. However, we do note that with this explanation we might expect some change when we include occupation fixed effects. The fact that we observe no such change in our analysis could indicate that some other explanation is more relevant.

In addition to the main interaction effect indicating the impact of the change to FEHA, table 7.3 also reports the coefficients for the direct effects of workers' compensation and disability. As expected, these direct effects are negative. However, it is perhaps somewhat surprising that the interaction between workers' compensation and disability status is also negative. The model in the previous section indicates that disabled workers' compensa-

24. The sample size for female workers' compensation recipients in California is too small to make it feasible to show results for females only.

25. The after-tax replacement rate is computed as a fraction of wages (two-thirds in California) of preinjury weekly wage subject to minimum and maximum amounts, and convert the benefits to after-tax status using the average tax rate in the state. Data on taxes come from the National Bureau of Economic Research (http://www.nber.org/~taxsim/), and the information on minimum and maximum benefit levels are taken from the Chamber of Commerce annual *Analysis of Workers' Compensation Laws.*

26. Here we only report the primary coefficients of interest, but in an appendix we include the full set of covariates for our preferred model.

27. The level of clustering appears to have no significant impact on the standard errors in our analysis.

Table 7.3   **Estimated employment effects of the change to the FEHA by disability status and workers' compensation benefit receipt**

	Fixed effect		
	None	County	Occupation
All workers			
Workers' comp·Post2002·Disabled	.355***	.356***	.362***
	(.124)	(.081)	(.124)
Post2002·Disabled	−.021	−.021	−.022
	(.027)	(.027)	(.026)
Workers' comp	−.081**	−.082*	−.08**
	(.036)	(.041)	(.032)
Disabled	−.044**	−.044**	−.043**
	(.018)	(.02)	(.016)
Workers' comp·Disabled	−.156	−.155*	−.160*
	(.096)	(.086)	(.089)
Male only			
Workers' comp·Post2002·Disabled	.542***	.538***	.555***
	(.155)	(.184)	(.168)
Post2002·Disabled	−.037	−.038	−.041
	(.033)	(.033)	(.05)
Workers' comp	−.084*	−.088*	−.081**
	(.046)	(.046)	(.036)
Disabled	−.017	−.017	−.014
	(.02)	(.023)	(.024)
Workers' comp·Disabled	−.22*	−.218	−.23*
	(.126)	(.139)	(.13)

Notes: Table reports linear probability estimates of the differential employment likelihood of disabled workers' compensation recipients versus disabled nonrecipients in the post-reform (i.e., after 2002) period. The sample is based on the matched CPS in California from 1996–2007, and the dependent variable is an indicator for whether the individual was working (at least one week worked) in the second year of the match. The sample is restricted to individuals who worked at least one week in the first year of the match. All regressions include demographic characteristics, as well as wages in the first year, the replacement rate of lost income in the workers' compensation system, and year fixed-effects. Robust standard errors are included in parentheses. In the models including fixed-effects for county and occupation, the standard errors are adjusted to allow for clustering by county and occupation, respectively.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

tion recipients subject to FEHA should have better employment outcomes. However, we expect that the negative effect could be attributed to a correlation with disability severity, as past work has shown that injury severity is highly correlated with filing for workers' compensation benefits (Biddle and Roberts 2003; Lakdawalla, Reville, and Seabury 2007).

    The dependent variable in this specification focuses only on whether or not the individual worked at all in the year. While this specification fits our

conceptual model it is somewhat restrictive, because a majority of workers employed in year 1 are also employed in year 2; approximately 95 percent of the nondisabled workers in our sample and 86 percent of the disabled workers are employed in year 2. As an alternative model, we use the actual number of weeks worked as the dependent variable, and report the results in table 7.4. The findings are consistent with the previous specification. Disabled workers' compensation recipients work about seventeen to eighteen

Table 7.4   **Estimated effects of the change to FEHA on the number of weeks worked by disability status and workers' compensation benefit receipt**

	Fixed effect		
	None	County	Occupation
All workers			
Workers' comp·Post2002·Disabled	17.732***	17.683***	17.553***
	(6.329)	(5.701)	(5.945)
Post2002·Disabled	–.997	–.953	–1.037
	(1.475)	(1.464)	(1.288)
Workers' comp	–3.933**	–3.792***	–3.723**
	(1.897)	(1.242)	(1.497)
Disabled	–3.85***	–3.839***	–3.751***
	(1.02)	(.876)	(.605)
Workers' comp·Disabled	–9.467**	–9.379**	–9.418**
	(4.565)	(3.766)	(3.978)
Male only			
Workers' comp·Post2002·Disabled	28.538***	27.884**	28.545***
	(8.06)	(10.699)	(8.028)
Post2002·Disabled	–1.679	–1.589	–1.808
	(1.92)	(1.975)	(2.585)
Workers' comp	–3.453	–3.541*	–3.086
	(2.407)	(1.753)	(2.134)
Disabled	–3.122**	–3.226**	–3.014**
	(1.266)	(1.419)	(1.277)
Workers' comp·Disabled	–14.372**	–13.833**	–14.389***
	(5.636)	(6.177)	(4.899)

Notes: Table reports ordinary least squares (OLS) estimates of the differential weeks worked of disabled workers' compensation recipients versus disabled nonrecipients in the post-reform (i.e., after 2002) period. The sample is based on the matched CPS in California from 1996–2007, and the dependent variable is the number of weeks the individual worked in the second year of the match. The sample is restricted to individuals who worked at least one week in the first year of the match. All regressions include demographic characteristics, as well as wages in the first year, the replacement rate of lost income in the workers' compensation system, and year fixed-effects. Robust standard errors are included in parentheses. In the models including fixed-effects for county and occupation, the standard errors are adjusted to allow for clustering by county and occupation, respectively.

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

more weeks relative to nonparticipants in the post-reform period. If we focus on men only, the effect is an increase of about twenty-eight to twenty-nine weeks worked.

Figure 7.2 and Figure 7.3 both indicate that the increase in disability discrimination claims was most pronounced in 2002 and was fairly persistent afterwards. We also know there were other changes to the workers' compensation system that took place in 2004 that might have affected employment for the disabled. Thus, if the effect that we find is really attributable to the adoption of AB2222 we would expect to see an effect in 2002 that persisted over time. In table 7.5 we report results from an alternative specification that allows the effect to vary over time. Specifically, we interact each year from 2001 through 2006 with the interaction term between workers' compensation benefit receipt and disability status. As before, we present separate results for all workers and for men, and report the results with and without county and occupation fixed effects.

From the table we see that there is no significant effect in 2001. If anything, the effect appears to be negative. Beginning in 2002, there appears to be a positive effect that is mostly consistent over time. For all workers, all five of the interaction terms from 2002 to 2006 are positive and four are positive and significant. For men as well, all five of the years 2002–2006 are posi-

Table 7.5	Estimated employment effects of the change to FEHA by disability status and workers' compensation benefit receipt, by year in the post-reform period					
	Interaction year					
Coefficient	2001	2002	2003	2004	2005	2006
	All workers					
Workers' comp·Year·Disabled	−.368	.288***	.404***	.104	.316***	.414***
	(.222)	(.061)	(.061)	(.292)	(.075)	(.065)
	Male only					
Workers' comp·Year·Disabled	−.348	.344***	.439***	.469***	.328***	.387***
	(.275)	(.103)	(.084)	(.114)	(.111)	(.114)

Notes: Table reports linear probability estimates of the differential employment likelihood of disabled workers' compensation recipients versus disabled nonrecipients in the post-reform (i.e., after 2002) period, with the estimated effect broken down by year. The sample is based on the matched CPS in California from 1996–2007, and the dependent variable is an indicator for whether the individual was working (at least one week worked) in the second year of the match. The sample is restricted to individuals who worked at least one week in the first year of the match. All regressions include demographic characteristics, as well as wages in the first year, the replacement rate of lost income in the workers' compensation system, and year fixed-effects. Robust standard errors are included in parentheses. In the models including fixed-effects for county and occupation, the standard errors are adjusted to allow for clustering by county and occupation, respectively.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

tive; furthermore, they are all positive and statistically significant at the 1 percent level.[28]

Taken together, the results of tables 7.3, 7.4, and 7.5 indicate that the employment outcomes of disabled workers who received workers' compensation benefits improved significantly after reforms increased the level of protection the disabled received against discrimination. The effect size appears quite large; given that approximately 86 percent of the disabled are employed in the second year, these effects indicate approximately a 40 percent increase in the likelihood of employment, even larger for men. However, given that the increase in allegations indicated in figures 7.2 and 7.4 was so large, perhaps it is not surprising that the estimated employment effect is also large. Although not reported here, we have examined the impact of the reform on wages, but the effect was insignificant. This is consistent with the setup of the model, which is based on the idea that the primary effect of workers' compensation is to offset the costs of accommodations that affect the likelihood that a worker is employed.

We cannot directly test for the impact of the changes to FEHA on employment, because we do not observe the expected costs associated with a claim for any particular worker. Therefore, it is important to verify that the effects we find are not driven by more general trends in the employment outcomes of the disabled. To do so, we duplicated our analysis using the matched CPS sample for workers outside of California, which should be unaffected by changes to FEHA. In addition, we restricted the non-California sample just to the western states (Washington, Oregon, Arizona, Nevada, and New Mexico—the western seaboard and states that border California), to capture the effects of any regional trends. The specification of all dependent and independent variables is the same as in table 7.3.

The results of this analysis are reported in table 7.6. The top panel reports results for the full United States, while the bottom reports results for the western states. As before, we present results using no fixed effects and fixed effects for county and occupation, though in table 7.6 we only report the primary coefficient of interest (the interaction term for workers' compensation receipt with disability status and the post period). As the table reports, we find no statistically significant changes in the employment of disabled workers' compensation recipients after 2002. This is true for the entire United States and for the western states. In all cases the coefficients are small, statistically insignificant, and have the wrong sign. All of these facts help suggest that the results we find are not part of a larger regional trend, and instead are associated with the change in the disability laws in California.

In table 7.7 we replicate the analysis allowing the effects to vary by year.

---

28. As an alternative approach, we simply estimated the model dropping years 2005 and later. This approach provided qualitatively identical results, in that we found a positive effect on employment of disabled workers' compensation recipients in the post-reform period.

Table 7.6   **Test of employment trends of disabled workers and workers'
compensation recipients outside of California in the post-reform period**

	Fixed effect		
	None	County	Occupation
Entire U.S. (excluding California)			
All workers			
Coefficient on workers' comp · Post2002 · Disabled	−.011	−.012	−.012
	(.059)	(.039)	(.044)
Male only			
Coefficient on workers' comp · Post2002 · Disabled	−.013	−.013	−.013
	(.079)	(.047)	(.064)
Western states (excluding California)			
All workers			
Coefficient on workers' comp · Post2002 · Disabled	−.112	−.106	−.116
	(.162)	(.136)	(.123)
Male only			
Coefficient on workers' comp · Post2002 · Disabled	−.155	−.135	−.159
	(.206)	(.18)	(.187)

Notes: Table reports linear probability estimates of the differential employment likelihood of disabled workers' compensation recipients versus disabled nonrecipients in the post-reform (i.e., after 2002) period. The sample is based on the matched CPS in from 1996–2007, excluding California, and the dependent variable is an indicator for whether the individual was working (at least one week worked) in the second year of the match. The western states include Washington, Oregon, Arizona, Nevada, and New Mexico. The sample is restricted to individuals who worked at least one week in the first year of the match. All regressions include demographic characteristics, as well as wages in the first year, the replacement rate of lost income in the workers' compensation system, and year fixed-effects. Robust standard errors are included in parentheses. In the models including fixed-effects for county and occupation, the standard errors are adjusted to allow for clustering by county and occupation, respectively.

The sample size for the western states only is comparatively small, so we restrict this analysis to the full U.S. population only. As before, the effect sizes are smaller, statistically insignificant, and generally have the wrong sign. This further supports the notion that the effects we find in our analysis are driven by a California-specific change to the labor market experience of disabled workers' compensation recipients and not reflective of some general trend. While we cannot completely rule out the possibility of another explanation, the timing of the effect and the general lack of an effect outside of California suggests that our findings are causally attributable to the changes in FEHA brought about by AB2222.

7.6   Conclusions

This chapter studies the interaction between policies that protect disabled workers from discrimination and policies that mandate compensation for workplace injuries, and how this influences the employment of disabled

Table 7.7   **Test of national employment trends of disabled workers and workers' compensation recipients in the post-reform period, by year (excluding California)**

	Interaction year				
Coefficient	2002	2003	2004	2005	2006
All workers					
Workers' comp · Year · Disabled	–0.065	–0.061	–0.008	–0.011	–0.016
	(0.056)	(0.068)	(0.077)	(0.090)	(0.066)
Male only					
Workers' comp · Year · Disabled	–0.080	–0.009	0.045	–0.091	–0.054
	(0.072)	(0.081)	(0.079)	(0.106)	(0.082)

Notes: Table reports linear probability estimates of the differential employment likelihood of disabled workers' compensation recipients versus disabled nonrecipients in the post-reform period with the effects broken down by year. The sample is based on the matched CPS in from 1996–2007, excluding California, and the dependent variable is an indicator for whether the individual was working (at least one week worked) in the second year of the match. The sample is restricted to individuals who worked at least one week in the first year of the match. All regressions include demographic characteristics, as well as wages in the first year, the re-placement rate of lost income in the workers' compensation system, and year fixed-effects. Robust standard errors are included in parentheses. In the models including fixed-effects for county and occupation, the standard errors are adjusted to allow for clustering by county and occupation, respectively.

workers. We predict that workers' compensation claimants should be more sensitive to changes in employment protection policies, specifically an exogenous increase in the costs associated with firing a disabled worker. We test this hypothesis using changes to the California Fair Employment and Housing Act (FEHA), making it easier for disabled workers to sue their employers for a failure to accommodate. The findings suggest that, as we suspected, workers' compensation recipients appeared to benefit more than other disabled workers from this policy change.

Often when comparing a private policy enforced through litigation with a regulatory public policy we are concerned with redundancy, but in this particular instance the overlap between the two systems actually helps to make the private litigation system more effective. In the broader context of studying the interaction between regulation and litigation, one aspect of our application that is somewhat unusual is that we are not considering the canonical example of overlap between ex ante regulation and ex post litigation over the same behavior. Nevertheless, we feel our results provide some insight into cases where the overlap between a regulatory system and a litigation system could be beneficial.

More generally, the addition of ex post taxes or subsidies for a regulatory system can help attain better outcomes when the socially optimal activity level varies across different subsets of the population. Such could be the case in our example if, in an example discussed previously, employers are more

likely to discriminate against workers' compensation claimants as a form of retaliation for filing a claim. There are other possible applications where this combination of ex post regulatory fines and litigation could generate socially optimal outcomes. Suppose, for example, that producers are subject to litigation if they pollute and impose external harm on private residents. Further suppose that the pollution has greater social harm in certain areas (e.g., a wetland) that will not be reflected in the private harm experienced by residents (and thus compensated by the litigation system). In such a case, social welfare could potentially be improved by allowing litigation and imposing a regulatory regime in the more sensitive area. That is not to say that this approach is the *only* way to achieve optimal outcomes in this example—an appropriately set Pigovian tax could achieve the same outcome—but it is an illustration of how a regulatory system and a litigation system can be used in a complementary fashion to improve social welfare.

There are numerous ways in which the work here can be expanded upon. The preliminary findings here do little to control for other important factors, such as firm size, that could affect the results. In addition, the CPS tracks individuals for such a short time that we have a very fixed window to track changes in labor force participation and separation. We will explore using panel data to consider a longer time horizon. Finally, while we focus on FEHA because of the specific changes in accommodation requirements, we might also expect the ADA to have different impact for workers who receive workers' compensation benefits.

Appendix

Estimation Results for the Full Set of Covariates

In table 7A.1 we provide the estimation results for the full set of covariates in our preferred specification. This is the model with the full sample of California workers (male and female), where employment is used as the dependent variable and no occupation or county fixed-effects are included. This corresponds to the results presented in the top row and first column of table 7.3.

The dependent variable is employment in the second period, so we expect that those factors that are generally predictive of better employment outcomes (e.g., higher levels of education) should have positive coefficients. We find that this is generally the case. Workers with a high school or college degree are significantly more likely to keep working, as are workers with higher wage rate. Our quadratic specification indicates that age has a positive but concave impact on the likelihood of working. Nonwhites are less likely to work in the second year. The temporary disability replacement rate in work-

Table 7A.1   **The full set of estimated coefficients for the employment model**

Explanatory variable	Coefficient	Standard error	*t*-stat	P(*t*)
Disabled and workers' comp in the post-period	0.355	0.124	2.870	0.004
Workers' compensation	−0.081	0.036	−2.250	0.025
Workers' comp in 2001	0.134	0.039	3.440	0.001
Workers' comp after 2002	−0.016	0.058	−0.270	0.785
Disabled	−0.044	0.018	−2.460	0.014
Disabled in 2001	0.058	0.037	1.590	0.113
Disabled in the post-period	−0.021	0.027	−0.800	0.426
Disabled and workers' comp	−0.156	0.096	−1.630	0.103
Disabled and workers' comp in 2001	−0.340	0.221	−1.540	0.124
Disabled in the post-period	−0.093	0.013	−7.170	0.000
Female	−0.042	0.004	−10.200	0.000
Age	0.014	0.002	6.580	0.000
Aged squared	−0.000	0.000	−6.000	0.000
Hispanic	−0.024	0.010	−2.430	0.015
African American	−0.011	0.006	−1.860	0.063
High school	0.042	0.008	5.330	0.000
Some college	0.042	0.008	5.300	0.000
College degree	0.054	0.007	7.480	0.000
Temporary disability rate · 1,000	−0.372	0.409	−0.910	0.364
Wage rate	0.000	0.000	−0.750	0.453
1997	−0.008	0.008	−0.940	0.348
1998	−0.005	0.008	−0.610	0.544
1999	−0.019	0.009	−2.170	0.030
2000	0.002	0.008	0.310	0.757
2001	−0.007	0.008	−0.780	0.435
2002	−0.017	0.009	−1.830	0.067
2003	−0.006	0.008	−0.720	0.469
2004	−0.022	0.010	−2.290	0.022
2005	−0.003	0.008	−0.360	0.719
2006	−0.021	0.009	−2.390	0.017
Constant	0.672	0.040	16.650	0.000

Notes: Table reports linear probability estimates of the differential employment likelihood of disabled workers' compensation recipients versus disabled nonrecipients in the post-reform (i.e., after 2002) period. The sample is based on the matched CPS in California from 1996–2007, and the dependent variable is an indicator for whether the individual was working (at least one week worked) in the second year of the match. The sample is restricted to individuals who worked at least one week in the first year of the match. Robust standard errors are included in parentheses.

ers' compensation is negatively associated with the likelihood of working, though the impact is small and not statistically significant. The year fixed-effects display no clear trend in employment, though there appears to be some general decline in the likelihood of working relative to base year (1996).

While we present the results for only our preferred specification, the same overall pattern arises in other specifications as well. Those factors that predict

employment in more general models also predict the likelihood of employment in the second year in our model.

Alternate Specification of Disability

In our main empirical work we use fair or poor self-reported health to indicate disability. We adopt this measure because (a) the definition of disability in FEHA is broad, and the self-reported health measure is more inclusive, and (b) we feel that there exists a greater potential for bias in the question that asks about work limitations. In table 7A.2 we present estimates of the model using a self-reported work limitation as our indicator of disability. The table presents results for the full sample (men and women) with our preferred model, using employment as the dependent variable (analogous to the model in the top panel of table 7.3).

In general, the results are consistent with our central findings, in terms of the signs of the estimated coefficients. The primary coefficient of interest, the interaction between disability and workers' compensation receipt in the post-reform period, is positive, though it is not statistically significant. The impact of this measure of disability on the likelihood of working, both on its own and interacted with workers' compensation receipt, is noticeably stronger than in the preferred model. This could be because this measure of

Table 7A.2	Model estimates using self-reported work limitations as the disability measure		
	All workers		
Workers' comp·Post2002·Disabled	.153	.153	.157
	(.138)	(.12)	(.132)
Post2002·Disabled	−.047	−.047	−.047
	(.051)	(.049)	(.041)
Workers' comp	−.000	−.000	−.000
	(.026)	(.023)	(.024)
Disabled	−.113***	−.115***	−.112***
	(.033)	(.027)	(.017)
Workers' comp·Disabled	−.308***	−.308***	−.310***
	(.093)	(.066)	(.061)
Fixed effect	None	County	Occupation

Notes: Table reports linear probability estimates of the differential employment likelihood of disabled workers' compensation recipients versus disabled nonrecipients in the post-reform (i.e., after 2002) period. The sample is based on the matched CPS in California from 1996–2007, and the dependent variable is an indicator for whether the individual was working (at least one week worked) in the second year of the match. The sample is restricted to individuals who worked at least one week in the first year of the match. All regressions include demographic characteristics, as well as wages in the first year, the replacement rate of lost income in the workers' compensation system, and year fixed-effects. Robust standard errors are included in parentheses. In the models including fixed-effects for county and occupation, the standard errors are adjusted to allow for clustering by county and occupation, respectively.

***Significant at the 1 percent level.

disability indicates worse overall health, but it is also consistent with a bias of unemployed workers being more likely to report a disability. Overall, we feel that self-reported health provides the most reliable measure of disability for this analysis. However, we do not that the statistical significance of our primary coefficient of interest is sensitive to the choice of specification.

References

Acemoglu, D., and J. D. Angrist. 2001. Consequences of employment protection? The case of the Americans with Disabilities Act. *Journal of Political Economy* 109 (5): 915–57.

Bernacki, E. J., J. A. Guidera, J. A. Schaefer, and S. Tsai. 2000. A facilitated early return to work program at a large urban medical center. *Journal of Occupational and Environmental Medicine* 42 (12): 1172.

Biddle, J., and K. Roberts. 2003. Claiming behavior in workers' compensation. *Journal of Risk and Insurance* 70 (4): 759–80.

Butler, R. J., W. G. Johnson, and M. L. Baldwin. 1995. Managing work disability: Why first return to work is not a measure of success. *Industrial and Labor Relations Review* 48:452–69.

Butler, R. J., and J. D. Worrall. 1985. Work injury compensation and the duration of nonwork spells. *The Economic Journal* 95 (379): 714–24.

DeLaire, T. 2000a. The unintended causes of the Americans with Disabilities Act. *Regulation* 23:194–97.

———. 2000b. The wage and employment effects of the Americans with Disabilities Act. *Journal of Human Resources* 35 (Fall): 693–715.

Galizzi, M., and L. Boden. 1996. *What are the most important factors shaping return to work? Evidence from Wisconsin.* Cambridge, MA: Workers' Compensation Research Institute.

Hotchkiss, J. L. 2003. *The labor market experience of workers with disabilities: The ADA and beyond.* Kalamazoo, MI: W. E. Upjohn Institute.

———. 2004. A closer look at the employment impact of the Americans with Disabilities Act. *Journal of Human Resources* 39 (4): 887–911.

Johnson, W. G., and J. Ondrich. 1990. The duration of post-injury absences from work. *The Review of Economics and Statistics* 72 (4): 578–86.

Jolls, C., and J. J. Prescott. 2004. Disaggregating employment protection: The case of disability discrimination. NBER Working Paper no. 10740. Cambridge, MA: National Bureau of Economic Research, September.

Kolstad, C. D., T. S. Ulen, and G. V. Johnson. 1990. Ex post liability for harm vs. ex ante safety regulation: Substitutes or complements? *American Economic Review* 80 (4): 888–901.

Krause, N., L. K. Dasinger, and F. Neuhauser. 1998. Modified work and return to work: A review of the literature. *Journal of Occupational Rehabilitation* 8 (2): 113–39.

Krueger, A. B. 1990. Workers' compensation insurance and the duration of workplace injuries. NBER Working Paper no. 3253. Cambridge, MA: National Bureau of Economic Research.

Lakdawalla, D. N., R. T. Reville, and S. A. Seabury. 2007. How does health insurance affect worker's compensation filing? *Economic Inquiry* 45 (2): 286–303.

Loisel, P., L. Abenhaim, P. Durand, J. M. Esdaile, S. Suissa, and L. Gosselin. 1997. A population-based, randomized clinical trial on back pain management. *Spine* 22 (24): 2911–18.

Meyer, B. D., W. K. Viscusi, and D. L. Durbin. 1995. Workers' compensation and injury duration: Evidence from a natural experiment. *American Economic Review* 85 (3): 322–40.

Neuhauser, F., and S. Raphael. 2004. The effect of an increase in worker's compensation benefits on the duration and frequency of benefit receipt. *Review of Economics and Statistics* 86 (1): 288–302.

Oi, W. Y. 1991. Disability and a workfare-welfare dilemma. In *Disability and work: Incentives, rights, and opportunities,* ed. C. L. Weaver, 45. Washington, DC: American Enterprise Institute Press.

Philipson, T. J., and E. Sun. 2008. Is the Food and Drug Administration safe and effective? *Journal of Economic Perspectives* 22 (1): 85–102.

Reville, R. T., and R. F. Schoeni. 2005. The fraction of disability caused at work. *Social Security Bulletin* 65 (4): 31–7.

Rosen, S. 1991. Disability accommodation and the labor market. In *Disability and work: Incentives, rights, and opportunities,* ed. C. L. Weaver, 18–30. Washington, DC: American Enterprise Institute Press.

Schwartzstein, J., and A. Shleifer. 2009. Litigation and regulation. NBER Working Paper no. w14752. Cambridge, MA: National Bureau of Economic Research, February.

Uehlein, W. F., and M. Nevils. 2008. Second injury funds in flux; opportunities, changes, and questions. *The Journal of Workers Compensation* 17 (3): 19–28.

Viscusi, W. K., and M. J. Moore. 1987. Workers' compensation: Wage effects, benefit inadequacies, and the value of health losses. *The Review of Economics and Statistics* 69 (2): 249–61.