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**Disability Discrimination Law, Disabled Employment, and the Relative Role of "Reasonable Accommodations" Requirements and Firing Costs**

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PRELIMINARY AND INCOMPLETE; PLEASE DO NOT CITE, QUOTE, OR REPRODUCE

Recent empirical work suggests that the Americans with Disabilities Act of 1990 (ADA) may have reduced rather than increased employment opportunities for individuals with disabilities. This unintended consequence of the ADA could have come about either as a result of the law's requirement that employers provide "reasonable accommodations" to individuals with disabilities (a requirement that obviously imposes costs on employers) or as a result of the "firing costs" that may be associated with the ADA. This paper exploits state-level variation in pre-ADA legal regimes governing disability discrimination to test apart the "reasonable accommodations" and firing costs explanations for reduced disabled employment following the ADA's passage. Our findings suggest that "reasonable accommodations" requirements play a more substantial role than firing costs in producing disabled unemployment. Our results also bolster the causal role ascribed to the ADA by previous studies because we observe a positive relationship between the degree to which the ADA went beyond the preexisting state-level regime and the degree of disabled unemployment after the ADA.

**I. Introduction**

Upon signing the Americans with Disabilities Act of 1990, President George H.W. Bush predicted that the law would "open up all aspects of American life to individuals with disabilities" and end the "unjustified segregation and exclusion of persons with disabilities from the mainstream of American life."<sup>1</sup> By prohibiting employers from discriminating against job candidates on the

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<sup>1</sup> Statement on Signing the Americans with Disabilities Act of 1990, 2 Pub. Papers 1070-71 (July 26, 1990).

basis of disability, Title I of the ADA was clearly intended to improve disabled individuals' opportunities to obtain employment.

Several recent empirical studies have cast doubt on the law's efficacy in this regard. DeLeire (2000) and Acemoglu and Angrist (2001) conclude that the ADA's enactment decreased rather than increased the employment levels of individuals with disabilities. To the extent that the law has had this unintended effect, it is generally thought to be the consequence of the fact that the ADA's prohibition on discrimination in hiring is difficult to enforce, while, at the same time, several of the ADA's other provisions may substantially increase the cost of employing disabled individuals. If the ADA makes individuals with disabilities more expensive to employ but does not effectively prevent employers from deciding not to hire them in the first place, then it is unremarkable that the law could be found to reduce disabled employment. Not surprisingly, this negative conclusion about the ADA's effects has stirred significant controversy in the disability policy community (see, for example, Schwochau and Blanck 2000:293-308).

Two central aspects of the ADA are most likely to have the effect of increasing the costs of employing disabled individuals. One is that the ADA requires employers to provide "reasonable accommodations" to individuals with disabilities—such as purchasing special equipment or altering workplace structures or procedures—unless such accommodations would create "undue hardship" for the employer. The second is that the ADA, by prohibiting discriminatory discharge on the basis of disability, creates "firing costs" associated with the employment of individuals with disabilities. In this second respect, the ADA parallels other civil rights statutes, and such statutes in some, although not all, circumstances appear to have produced negative employment effects for targeted employee groups (see Oyer and Schaefer 1999).

Because the ADA imposed both of the two types of legal requirements at the same time (upon its initial enactment), the DeLeire and Acemoglu/Angrist studies—which compare disabled

employment levels before and after the ADA—are not well-suited to the task of testing apart the “reasonable accommodations” and firing costs explanations for lower disabled employment levels.<sup>2</sup> The relative roles of the ADA’s “reasonable accommodations” requirement and its imposition of firing costs are pressing from a policy perspective given that, as already noted, numerous other civil rights statutes—including those prohibiting discrimination on the basis of race, sex, national origin, age, and (at the state level in some states) sexual orientation—also potentially generate firing costs.

The present study seeks to test apart the “reasonable accommodations” and firing costs explanations for reduced disabled employment by exploiting the substantial state-level variation in disability discrimination regimes that existed prior to the ADA’s enactment. During this period, some states imposed legal restrictions on employers that, like the ADA, both required employers to make “reasonable accommodations” for disabled workers and subjected employers to a “traditional antidiscrimination prohibition” (forbidding discrimination in hiring, firing, and terms and conditions of employment), with its associated firing costs. Meanwhile, other states imposed no limits whatsoever on private employers’ treatment of disabled workers prior to the ADA’s enactment. Finally, the remaining group of states took a middle course by imposing a traditional antidiscrimination prohibition but not requiring employers to make “reasonable accommodations” for disabled workers. By looking at the effects of the ADA on disabled employment separately in each of these three groups of states, we can provide a measure of the relative importance of “reasonable accommodation” requirements and traditional antidiscrimination prohibitions in driving employment effects for disabled workers.

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<sup>2</sup> Acemoglu and Angrist (2001:940-41) attempt to examine this issue by looking at whether “separation rates” of disabled workers rose in the post-ADA period; they find no discernible effect on separation rates and therefore tentatively suggest that the negative effects of the ADA may have come primarily from its “reasonable accommodations” requirement. However, as they emphasize, the separation rate information is “plagued by considerable measurement error,” and this may explain their failure to find an effect of the ADA on separation rates.

A further payoff of the approach taken here is that it provides an important check on the causal inferences drawn by DeLeire and Acemoglu/Angrist from the observed correlation between the timing of the ADA and the timing of declines in disabled employment. Obviously a significant concern with any study of outcomes before and after the passage of a federal law is that developments other than the passage of the law—including changes in the economic, social, and technological environment—may have occurred at the same time and may be the actual causes of the observed changes in employment outcomes. Both DeLeire and Acemoglu/Angrist adopt a range of strategies to attempt to control for alternative explanations for the decline in disabled employment after the passage of the ADA; for instance, although federal disability benefits (which reduce disabled individuals' need for wage-based income and thus, potentially, these individuals' likelihood of being employed) increased substantially over this period, Acemoglu and Angrist find that the post-ADA decline in disabled employment persists (although in weaker form) even after controlling for the increase in benefits.<sup>3</sup> Despite the steps taken by DeLeire and Acemoglu/Angrist to bolster the case for a causal link to the ADA, their work has been criticized in the disability policy community for its causal inference (see Kruse and Schur 2001:1-9; Schwochau and Blanck 2000:298-308). The concern about a potentially spurious connection between the ADA and decreased disabled employment is made more pressing by the recent findings of Kruse and Schur (2001:18-19) that when disaggregated information about the nature of individuals' disabilities is used, there appears to be little correlation between the passage of the ADA and employment declines for a particular group of disabled individuals who are especially likely to be covered by the ADA.

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<sup>3</sup> Acemoglu and Angrist find that the negative effect on disabled employment in the post-ADA years remains for disabled workers between 21 and 38 years old, although arguably not for older ones. Increases in disability benefits do, however, clearly play some role in explaining the decline in disabled employment over the course of the 1990s (Autor and Duggan 2001; Bound and Waidmann 2000).

Our research, by looking at the effects of the ADA separately in those states that had similar legal regimes prior to the ADA's enactment, in those states that had no preexisting legal regime, and in those states that imposed traditional antidiscrimination prohibitions but no "reasonable accommodations" requirements prior to the ADA, provides an important new test of the causal link between the ADA and declines in disabled employment. If we end up observing the ADA having the smallest effects on disabled employment in states with ADA-like legal regimes prior to the ADA's enactment, having the biggest effects in states with no preexisting legal regimes, and having medium-sized effects in states with traditional antidiscrimination prohibitions but no "reasonable accommodations" requirements prior to the ADA, then the case for a causal interpretation of the ADA's role in explaining declines in disabled employment will obviously be stronger.<sup>4</sup>

The remainder of the paper proceeds as follows. Section II provides the analytic background to studying the effects of accommodation mandates (such as the "reasonable accommodations" requirement imposed by the ADA) and traditional antidiscrimination prohibitions. Section III describes the data used in our empirical analysis. Section IV discusses our estimation strategy. Section V presents results, and section VI concludes.

## **II. Analytic Framework**

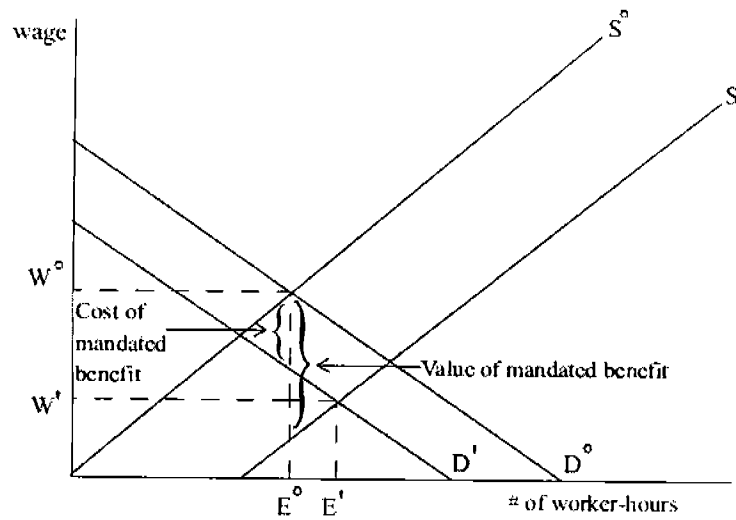
Lawrence Summers (1989) describes how to analyze the wage and employment effects of an employment mandate directed to workers as a whole, such as a requirement that all workers be provided with health insurance. As he shows, the wage and employment effects of a mandate depend upon on the relative magnitude of the shifts in the labor demand and labor supply curves,

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<sup>4</sup> Our inquiry here complements Acemoglu and Angrist's investigation of the relationship between Equal Employment Opportunity Commission (EEOC) charge rates across states and the magnitude of the decline in disabled employment across states; they find, employing an instrumental variables approach, that states with the highest EEOC charge rates under the ADA tended to experience the largest drops in disabled employment, a finding that supports their causal interpretation.

which in turn depend upon the value and the cost, respectively, of the mandated benefit. See Figure 1. This figure depicts the case in which the value of the mandated benefit exceeds its cost. The pre-mandate equilibrium is  $(E^{\circ}, W^{\circ})$ ; the post-mandate equilibrium is  $(E', W')$ .

Figure 1  
Effects of a mandate directed to workers as a whole



At almost the same time in the legal literature, Donohue (1986) used the same basic building block—a simple supply-and-demand diagram—to offer a partial equilibrium account of the wage and employment effects of traditional antidiscrimination prohibitions. According to Donohue, such a prohibition, if fully enforced, requires employers to operate off their pre-intervention labor demand curves and thus increases both the wage and the employment level of workers in the discriminated-against group. Donohue's analysis is partial equilibrium in the important sense that it examines wage and employment effects on the discriminated-against group assuming no changes for the remaining group.

In prior work (Jolls 2000; Jolls 2001), one of us extended the Summers and Donohue analyses to examine both accommodation mandates—mandates directed to a discrete sub-category of workers, such as individuals with disabilities, rather than to workers as a whole—and traditional antidiscrimination prohibitions, beginning from the same simple supply-and-demand framework.<sup>5</sup> The supply-and-demand analysis takes account both of the effects of legal intervention on the group targeted by the intervention (for instance, disabled workers) and—unlike Donohue’s analysis—also of the effects on the remaining workers. The need to distinguish between effects on alternative groups of workers did not arise at all in Summers’s original analysis because he focused on mandates (such as health insurance) directed to workers as a whole. It turns out that both accommodation mandates and traditional antidiscrimination prohibitions can be analyzed in essentially the same way within a supply-and-demand framework.

Once effects on different groups are taken into account, a critical role in labor market outcomes after the imposition of an accommodation mandate or traditional antidiscrimination prohibition is played by the effective enforceability of legal restrictions on wage and employment differentials between the group targeted by the legal intervention and the remaining workers. If both restrictions on wage differentials and restrictions on employment differentials across the two groups are fully binding, then, as a result of the potential for cross-subsidization between groups, both accommodation mandates (such as the “reasonable accommodations” requirement of the ADA) and traditional antidiscrimination prohibitions have an important redistributive potential that is missing from the original Summers account of the wage and employment effects of labor market intervention (Jolls 2000:247-51). If, instead, neither restrictions on wage differentials nor restrictions on employment differentials are binding, then wage and employment effects largely replicate those

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<sup>5</sup> Acemoglu and Angrist (2000:920-24) treat a similar set of issues more mathematically, offering a general equilibrium model of the effects of the ADA’s “reasonable accommodations” mandate and its traditional antidiscrimination prohibition.

from the Summers analysis. Finally, it is obvious that, if wage differentials are binding while employment differentials are not, then employers will have an incentive not to hire members of the group targeted by the legal intervention, as these individuals will generally be more costly to employ (either because they must be accommodated or because of factors such as firing costs) and yet it will not be possible to make them bear the higher costs themselves through wage reductions.<sup>6</sup>

This third scenario is the one that is most likely to be relevant in the context of the ADA. Legal restrictions on wage differentials are likely to be binding in the disability context because wage differences are reasonably easy to detect; only with much greater occupational segregation on the basis of disability could employers make wage adjustments targeted to a discrete group without incurring a serious risk of legal liability. In this respect the disability context differs importantly from that of sex, where significant occupational segregation, at least in the past, apparently permitted employers to make group-specific wage adjustments without legal impediment (Gruber 1994).<sup>7</sup> At the same time, while restrictions on wage differentials between disabled and nondisabled workers seem likely to be binding, restrictions on employment differentials between the two groups are relatively unlikely to bind. The general difficulty of enforcing prohibitions on discrimination in hiring is well known, and the problem is particularly severe in the disability context because of the relatively small size of the protected group and the resulting heightened litigation difficulty of establishing statistical disparities in employment patterns (Jolls 2000:275). Accordingly, the

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<sup>6</sup> Although some studies have suggested that the cost of providing disabled workers with accommodations are modest (see Stein 2000:322-23 for a summary), these findings are based on voluntarily provided accommodations and thus seem likely to reflect a cost-skewed sample (Chirikos 1999:94; Acemoglu and Angrist 2000:919).

<sup>7</sup> Gruber finds that legal mandates requiring employers to pay childbirth expenses as part of their health insurance coverage—mandates that disproportionately altered the costs of employing female workers of childbearing age—resulted in reduced wages for female employees of childbearing age with no detectable change in these individuals' employment levels. Thus, apparently, occupational segregation by sex was sufficiently great that industry-based wage reductions led to a detectable reduction in the wages of female employees of childbearing age. The alternative possibility, that male and female workers side by side were earning different wages, is possible but seems less likely.



predicted effect of the ADA is to reduce the employment of disabled workers while having relatively little effect on their wages, and, as described in the introduction, this is in fact what both DeLeire and Acemoglu/Angrist find. The following section describes the data this paper uses to refine the empirical understanding of the ADA's effects on disabled employment.

### **III. Data**

#### **A. State Law Regimes**

Tables 1a-1c below report the results of our research into state disability discrimination regimes prior to the ADA. As the tables reveal, states in this period had widely varying statutory and judicial regimes governing employers' treatment of disabled workers. Some states imposed substantive requirements parallel to those ultimately imposed by the ADA; these states are listed in Table 1a, and because of the similarity between their legal regimes and the ADA, we refer to them as "control states." A second group of states imposed no limits whatsoever on private employers' treatment of disabled workers; these states comprise our first experimental group ("experimental group 1") and are listed in Table 1b. (We address below concerns about the fact that there are only three states in this group and that all of them are southern states.)<sup>8</sup> A second group of our experimental states ("experimental group 2") tracked the ADA in imposing some form of traditional antidiscrimination prohibition with its associated firing costs, but diverged from the ADA in not expressly requiring "reasonable accommodations" as mandated by the ADA; these states are listed in Table 1c.<sup>9</sup> No states imposed express requirements of "reasonable accommodations" without having traditional antidiscrimination prohibitions.

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<sup>8</sup> These three states did prohibit disability-based discrimination by *public* employers (akin to the employment provisions of the Rehabilitation Act of 1973, the federal predecessor to the ADA's regime governing private employers), but did not prohibit such discrimination by private employers.

<sup>9</sup> Note that even states that did not expressly require "reasonable accommodations" alongside their traditional antidiscrimination prohibitions may have required certain limited forms of

Our categorization of the pre-ADA state regimes in Tables 1a-1c differs significantly from the state law information mentioned briefly by Acemoglu and Angrist (2001:948). As one check on their causal interpretation of the ADA's role in explaining the declines in disabled employment, Acemoglu and Angrist examine the relationship between EEOC charge rates across states and the magnitude of the decline in disabled employment across states; they find a positive correlation and interpret this as supporting a causal inference from the ADA. In performing this exercise they instrument for EEOC charge rates using information about pre-ADA state disability discrimination regimes (given the obvious concern that both EEOC charge rates and disabled employment outcomes could be driven by local economic conditions). Their measure of pre-ADA state disability discrimination regimes is correlated, though to a relatively limited degree, with post-ADA EEOC charge rates, perhaps because those states with relatively weak pre-ADA regimes will tend to experience a higher number of EEOC charges once the ADA comes into effect.

In Acemoglu and Angrist's categorization of states laws, 16 states have pre-ADA disability discrimination regimes governing employment (compared to 47 in our Tables 1a and 1c); moreover, among the 16 states Acemoglu and Angrist draw no distinction between regimes imposing both a "reasonable accommodations" requirement and a traditional antidiscrimination prohibition and those imposing just a traditional antidiscrimination prohibition.<sup>10</sup> The reason for the small number of states with pre-ADA laws in Acemoglu and Angrist's categorization is that they do not count states

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accommodation as a matter of the "disparate impact" branch of their traditional antidiscrimination prohibitions, just as the disparate impact branch of Title VII of the Civil Rights Act of 1964 in some circumstances requires accommodation of racial or other differences between groups despite the absence of an express "reasonable accommodations" requirement (Jolls 2001:652-66). However, the scope and degree of accommodation required under disparate impact law is likely to be substantially less, particularly as a practical matter, than what is required under an express mandate of "reasonable accommodations," especially given the difficulty of making statistical showings in the disability context.

<sup>10</sup> Of the 16 states used by Acemoglu and Angrist, 3 (Minnesota, Vermont, and Washington) imposed "reasonable accommodations" requirements as well as traditional antidiscrimination prohibitions prior to the ADA (see Table 1a), while the other 13 imposed only traditional antidiscrimination prohibitions.

that, according to a secondary source (Advisory Commission on Intergovernmental Relations 1989:43), fail to provide for “misdemeanor charges or civil penalties” in the event of employer violations. We choose not to impose this limit because all of the states with pre-ADA disability discrimination regimes listed in Tables 1a and 1c provided for monetary damages together with forward-looking injunctive (nonmonetary) relief from the employer to the discriminated-against employee—the ordinary and routine remedy in the employment discrimination context.<sup>11</sup> Thus, our approach includes all states with disability discrimination regimes prior to the ADA (Tables 1a and 1c) and, in addition, distinguishes among those regimes based on the presence or absence of a “reasonable accommodations” requirement alongside a traditional antidiscrimination prohibition.

One important feature of the state disability discrimination law regimes that we examine is that in some circumstances “reasonable accommodations” requirements were reflected in administrative regulations even if they did not appear in legislative enactments. Accordingly, our research strategy had to go beyond the usual sources examined in empirical work on state-level employment law and to look extensively at administrative regulations.<sup>12</sup> Incorporation of “reasonable accommodations” requirements imposed by administrative agencies leads to an alternative (larger) group of “control states” (Table A1) and a correspondingly smaller set of “group 2 experimental states” (Table A2), with no change in the “group 1 experimental states.” We report results below for both the categorization reflected in Tables 1a-1c and the categorization reflected in Tables A1, 1b, and A2.

Another dimension along which the pre-ADA state law regimes differed from one another and, in some cases, from the ADA is in how the category of “disability” (or, in some states’

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<sup>11</sup> In a footnote in their discussion of pre-ADA state regimes, Acemoglu and Angrist state that “many states had FEP [Fair Employment Practices] laws without any sanctions.” It is unclear to us what they mean by this.

<sup>12</sup> We are not aware of any other empirical research in the state employment law area that examines state-level administrative regulations.

terminology, “handicap”) was defined. Some states used definitions that tracked the one ultimately adopted in the ADA (and originally used in the Rehabilitation Act of 1973), under which an individual is disabled if he or she “has a physical or mental impairment which substantially limits one or more major life activities, has a record of such an impairment, or is regarded as having such an impairment.” We categorize a state as having an ADA-like definition if its definition matched this one in two respects: 1) it included the “regarded as” language, so as to embrace individuals viewed as impaired even if not actually impaired, and 2) it embraced mental as well as physical disability. A second group of states used definitions that had “regarded as” language but embraced only individuals with physical disabilities. A third group used definitions that included those with mental as well as physical disabilities but did not employ “regarded as” language. A fourth group used definitions that embraced only those with physical disabilities and did not employ “regarded as” language. Table 2 categorizes the state laws into these four groups, and Table A3 provides the full text of each state’s definition.

## **B. “Disability” Status**

For the disability status of individuals—as well as for all other variables apart from data on the state legal regime (employment levels, wages, and various demographic and other controls)—we use data from the March CPS. This approach permits maximum comparability with Acemoglu and Angrist’s study, which uses the same data source. Like Acemoglu and Angrist, we refer to data by its year of observation (the year preceding the March survey), and, also like them, we restrict attention to individuals aged 21 and 58. Variables and summary statistics for the years we examine (1987-1994), both for the aggregate sample and for the four subsamples used by Acemoglu and Angrist, are reported in Table 3. (In their corresponding descriptive statistics table they depart from their usual approach and refer to data by its survey year rather than its observation year. Thus our

1987 corresponds to their 1988, and so forth.) Our numbers for the subsamples are fairly close (in some cases very close) to those reported by Acemoglu and Angrist.<sup>13</sup>

The CPS variable for disability requires some discussion. (For an account of varying approaches to the definition of disability, see Burkhauser and Daly 2002:219-20.) The CPS definition of disability comes from the March income supplement and reflects the subject's answer to the question, "Does [respondent] have a health problem or a disability which prevents him/her from working or which limits the kind or amount of work he/she can do?" An affirmative answer to this question does not map perfectly or even that closely onto the ADA's definition of disability (Schwochau and Blanck 2000:299-300; Hale 2001); as Hale notes, the question was designed to serve as a screen for questions on sources of income. Nonetheless, it seems clear that the CPS disability question measures something sufficiently correlated with the definition of disability under the ADA that if we study how those who answer "yes" to the survey question were affected by the ADA, we learn something important about the effects of the law on the covered population. A similar point applies to the fact that the pre-ADA state law regimes had definitions of disability (described just above) that differed from the definition reflected in responses to the CPS question.<sup>14</sup>

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<sup>13</sup> For instance, for the first year (observation year 1987) and the first subsample (men aged 21-39), we have 1049 observations for disabled workers, compared to their 1059; a mean age of 31.1, identical to theirs, and so on. Other variables, such as race, differ somewhat, presumably as a result of the fact that our data in Table 3 are unweighted, whereas Acemoglu and Angrist's descriptive statistics are weighted.

<sup>14</sup> In the future, the CPS is likely to include disability questions that map more closely onto the ADA's definition (Executive Order 13078). However, such information obviously will not be available for either the time frame around the ADA's passage or the time frame in which various state disability discrimination laws were passed, and therefore the existing CPS measure seems to be the best hope for attempting to measure the effects of these legal regimes on disabled employment.

#### IV. Estimation Strategy

##### A. Difference-in-Difference-in-Difference Framework

Our estimation strategy is a straightforward difference-in-difference-in-difference (DDD) approach similar to that used, for example, in Gruber (1994) or Collins (2001). All regressions take the form:

$$\begin{aligned} Y_{ijt} = & \beta_0 + \beta_1 X_{ijt} + \beta_2 ADA_t + \beta_3 DIS_i + \beta_4 GR1_j + \beta_5 GR2_j \\ & + \beta_6 (ADA_t \times DIS_i) + \beta_7 (ADA_t \times GR1_j) + \beta_8 (ADA_t \times GR2_j) + \beta_9 (DIS_i \times GR1_j) + \beta_{10} (DIS_i \times GR2_j) \\ & + \beta_{11} (ADA_t \times DIS_i \times GR1_j) + \beta_{12} (ADA_t \times DIS_i \times GR2_j); \end{aligned} \quad (1)$$

where  $Y$  is a labor market outcome of interest;  $i$  indexes individuals,  $j$  indexes states, and  $t$  indexes years;  $X$  is a vector of demographic characteristics;  $ADA$  is a dummy variable equal to 1 in the post- $ADA$  period;  $DIS$  is a dummy variable equal to 1 for disabled individuals;  $GR1$  is a dummy variable equal to 1 for states in the group 1 experimental group; and  $GR2$  is a dummy variable equal to 1 for states in the group 2 experimental group.<sup>15</sup> In all regressions we compare a two-year period prior to the  $ADA$  with a two-year period subsequent to the  $ADA$ .

The coefficients of interest in equation (1) are the coefficients on the triple interaction terms,  $ADA_t \times DIS_i \times GR1_j$  and  $ADA_t \times DIS_i \times GR2_j$ .  $\beta_{11}$ , the coefficient on the first of these terms, measures the change between the pre- and post- $ADA$  periods in disabled versus nondisabled outcomes in group 1 experimental states (those with no pre- $ADA$  restrictions on employers' treatment of disabled workers) relative to this same change in control states (those with preexisting "reasonable accommodations" requirements and traditional antidiscrimination prohibitions). In other words,  $\beta_{11}$  tells us how relative disabled outcomes changed in states in which both substantive requirements of the  $ADA$  were new (experimental group 1) compared to how these outcomes

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<sup>15</sup> Because there are two (nonoverlapping) groups of experimental states in our study, several of the interactions between the dummy variables are always zero (in particular,  $GR1_j \times GR2_j$ ,  $ADA_t \times GR1_j \times GR2_j$ ,  $DIS_i \times GR1_j \times GR2_j$ , and  $ADA_t \times DIS_i \times GR1_j \times GR2_j$ ), and thus these drop out of equation (1).

changed in states in which neither substantive requirement was new (control group). The answer provides a measure of the effect of imposing both a “reasonable accommodations” requirement and a traditional antidiscrimination prohibition in favor of disabled workers. Note that this approach does not assume that the federal law made no difference at all in states with substantively comparable pre-ADA regimes (the control states); the enactment of the federal law made available EEOC enforcement and altered other procedural aspects of the legal regime such as the opportunity for federal court enforcement, and these changes may have had effects on disabled outcomes. Common effects of the federal regime across all states are permissible under the approach taken here, although we are not able to identify these effects. For discussion of a similar approach in the closely related context of state- and federal-level race and sex discrimination laws, see Neumark and Stock (2001:19-23).

While  $\beta_{11}$  measures the effect of imposing both a “reasonable accommodations” requirement and a traditional antidiscrimination prohibition,  $\beta_{12}$  measures the effect of imposing just a “reasonable accommodations” requirement (given an existing traditional antidiscrimination prohibition); this is so because  $\beta_{12}$  measures the change between the pre- and post-ADA periods in disabled versus nondisabled outcomes in group 2 experimental states (those with preexisting traditional antidiscrimination prohibitions) relative to control states, and the difference between these two groups is the absence versus the presence of a “reasonable accommodations” requirement. (Both had traditional antidiscrimination prohibitions prior to the ADA.) Finally, the effect of imposing just a traditional antidiscrimination prohibition is given by the difference between  $\beta_{11}$  (the effect of imposing both a “reasonable accommodations” requirement and a traditional antidiscrimination prohibition) and  $\beta_{12}$  (the effect of imposing just a “reasonable accommodations” requirement given an existing traditional antidiscrimination prohibition).

Note that because of the nature of the “experiment” here, difference-in-difference-in-difference estimates do not raise the sort of endogeneity concern that often may exist in the more common set-up in which some states have passed a particular law during a given time period while others have not, and in which changes in outcomes across the two groups of states are then compared. In that setting, there is always the risk that the change in the relative labor market outcomes in the different states reflects not the legal changes but rather some set of underlying state-level social or economic changes that also *caused* the change in the state laws (Besley and Case 2000). With the federal experiment used here, by contrast, that sort of endogeneity concern goes away because almost all of the state laws in question were enacted significantly before the ADA went into effect (see Tables 1a and 1c), and, of course, the federal intervention is unlikely to reflect state-specific social or economic changes.<sup>16</sup> Our research cannot examine the effects of state law changes prior to the ADA against the benchmark of states that did not enact disability discrimination laws prior to the ADA because the CPS disability measure we use originated shortly before the ADA’s enactment and thus after virtually all of the pre-ADA state-law enactments were already in place.<sup>17</sup>

The approach used here rests on the assumption that there are discrete, identifiable objects such as “a reasonable accommodations requirement” and “a traditional antidiscrimination

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<sup>16</sup> A further consequence of the nature of the “experiment” here is reduced concern that results may be affected by migration of disabled workers in response to varying state law regimes. In the usual difference-in-difference-in-difference set-up, in which some states introduce a particular law during a given time frame while others do not, there is always the concern that some workers in a given category may respond to the adoption of protective laws in certain states by considering migration to those states. It is conceivable that workers would respond to the enactment of a federal law such as the ADA by moving (or returning) to states that, unlike their current states, did not, prior to ADA, regulate employment discrimination as stringently as the ADA, but because migration effects have not been found even in the usual difference-in-difference-in-difference setting (Collins 2001:24-25), they seem unlikely to be a significant factor in our work.

<sup>17</sup> Examples of studies that examine both a federal policy change across different state groups (our approach here) and pre-federal-law effects of state law changes include Gruber (1994) and Neumark and Stock (2001).



prohibition.” In fact there are different versions of these substantive requirements, depending on how the protected category of “disability” is defined, the size of employer to which the legal restriction applies, and so forth. Our analysis below accounts for what is clearly the most important dimension of variation in the ADA context—the definition of “disability”; as noted above, alternative approaches to the definition of “disability” are set forth in Tables 2 and A3.

### **B. The Choice of “Before” and “After” Periods**

A critical, though often under-discussed, issue in any approach that examines outcomes before and after a legal change is what counts as “before” and what counts as “after.” This question is especially tricky for the ADA because its unanimous passage was uniformly and widely anticipated in legal treatments and in the media the year before the law actually passed, and because there then followed a two-year gap between the law’s official passage (in July of 1990) and its effective date (July of 1992).<sup>18</sup>

Several important questions arise from the sequence of events surrounding the passage of the ADA. First, should 1989 be grouped with the rest of the “pre-effective-date” years—1990, 1991, and the first half of 1992—in which the ADA was obviously “on the horizon” in an important sense but not yet in effect? Our view is that it probably should be, given the substantial legal and media coverage of the ADA in 1989 with frequent reference to the certain or virtually certain passage of the law the following year. In the legal literature, for instance, Chatoff (1989:13) stated that the ADA “inevitably will” become law; Gardner (1989:558) wrote that Congress “seems almost certain to enact” the ADA “in the very foreseeable future,” and Tucker (1989:923) authored an entire article on the ADA’s provisions and opened her analysis with the statement, “The Americans with

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<sup>18</sup> A further wrinkle, for which we do not attempt to account here, is that the ADA, while it took effect for employers with 25 or more employees in July of 1992, did not take effect for employers with between 15 and 25 employees until July of 1994. Employers with fewer than 15 employees continue not to be covered by the ADA.

Disabilities Act is expected to be passed by Congress and signed by President Bush in 1990.” In the popular media, Shapiro (1989), stated of the ADA that “President Bush . . . guaranteed the bill’s passage with his support.” Of particular interest to us are industry periodicals targeted to employers and their managerial employees; in this category, Romeo (1989:72) reports in an article in *Nation’s Restaurant News* that at a meeting that year of the National Restaurant Association the “Americans with Disabilities Act was mentioned several times”; that a member of the Association’s Human Resources Committee stated that the law “will affect us in the very near future”; and that another Association official stated that the “ADA seems certain to pass.” Similarly, an editorial entitled “Accommodating Disabled Workers in the Construction Industry,” published in 1989 in the *Engineering News-Record*, stated that passage of the ADA “seems certain to follow.”<sup>19</sup> Because of the widespread and confident predictions in 1989 of the ADA’s impending passage, most of our empirical analysis includes 1989 in the “pre-effective-date” category, although we also report results for the case in which 1989 is not included in this period.

A second important question for our analysis involves how to treat the “pre-effective-date” period, however it is ultimately defined. On the one hand, there was not yet any actual change in the federal legal status of disabled workers during this period (up through July of 1992); this suggests that these years should be treated as the “pre-ADA” period against which to compare post-enactment outcomes. Further support for this idea is provided by Acemoglu and Angrist’s (2001:929-30, 932) conclusion that there is little evidence of anticipation effects prior to the ADA’s effective date in 1992, although there may be an important circularity to their argument because the argument is based on a lack of employment declines prior to 1992 and yet the ultimate question is precisely at what point to measure employment effects of the ADA. Running contrary to these arguments is the

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<sup>19</sup> In total, a search of the Lexis-Nexis News Group File for mentions of the ADA in 1989 yielded 305 hits, compared to 965 the following year when the law was officially passed. Although the number is higher in the year of official enactment (as would be expected), the two figures do not differ by anything close to an order of magnitude.

fact that, as described in the preceding paragraph, the ADA was widely publicized during the “pre-effective-date” period (as early as 1989), and, moreover, once the law was officially enacted in 1990, it is not clear how much awareness many managerial employees would have had of the delayed official effective date. A further argument against treating the “pre-effective-date” period as the “pre-ADA” period is that presumably employment decisions are made with at least some foresight about the governing legal regime one, two, or three years in the future. Just as a matter of common sense, we believe that treating the “pre-effective-date” period as the benchmark against which to look for labor market changes resulting from the ADA is not the soundest approach. Therefore, most of the empirical analysis below uses the years before the “pre-effective-date” years as the “pre-ADA” period, although, once again, we also report results under the alternative timing assumption.

A final important question about timing involves whether to treat 1992 as a “pre-effective-date” year or as a “post-ADA” year. As noted above, the law went into effect in July of 1992. Given this effective date, one might in some sense expect the biggest effects to be seen in the second half of 1992, but, at the same time, the law was not yet in effect during the first half of 1992. Acemoglu and Angrist’s (2000:929) empirical results are interesting in that they suggest some difference between disabled women and disabled men regarding this timing question; these authors observe employment effects for women beginning in 1992 but not for men until 1993. Because of this ambiguity, we report both regressions treating 1992 as the first “post-ADA” year (which we view as the soundest approach) and also regressions treating 1992 as a “pre-effective-date” year and 1993 as the first “post-ADA” year. One incidental advantage, however, of our focus on the case in which 1992 is treated as the first “post-ADA” year is that it avoids placing the ADA line precisely at

the point (between the 1993 and 1994 CPS surveys, corresponding to observation years 1992 and 1993) at which the CPS redesign occurred.<sup>20</sup>

## V. Results

### A. Univariate Approach

Tables 4 and A4 provide a first look at the post-ADA employment effects for disabled and nondisabled workers in group 1 and group 2 experimental states compared to control states. These tables report the mean employment levels for disabled and nondisabled workers before and after the ADA for each of the three state law groups. Following Gruber (1994), we use two-year windows before and after the law change, and, as described just above, we treat 1988 as the last pre-ADA year and 1992 as the first post-ADA year. (Alternative timing assumptions are discussed in the next subsection, where we report regression results.) We focus in these initial tables of means on employment levels rather than wages because both DeLeire and Acemoglu/Angrist find effects of the ADA on employment rather than on wages. (Our regressions below examine wages as well.)

Table 4 reflects the categorization of state law regimes given in Tables 1a-1c, based on statutory and judicial law. Our results show substantial effects of the pre-ADA state-level legal regime on the relative employment outcomes for disabled workers. The top panel compares group 1 experimental states (those with no pre-ADA legal restrictions on private employers' treatment of disabled workers) to the control states and thus provides a measure of the effect of imposing both a "reasonable accommodations" requirement and a traditional antidiscrimination prohibition. As shown in the table, the mean-based difference-in-difference-in-difference estimate for the change in disabled employment is  $-2.945$  with a standard error of  $1.580$ . (Thus the point estimate is just shy of significance at the 5% level.) This estimate comes from comparing the mean change in disabled

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<sup>20</sup> For discussion of the CPS redesign, see Acemoglu and Angrist (2001:925, 951).

employment in group 1 experimental states to that same change in control states (-2.455), and then comparing this difference-in-difference to the mean change in nondisabled employment in group 1 experimental states compared to that same change in control states (0.489). Given that the base number of weeks employed for disabled workers prior to the ADA's enactment was 12.671 in the group 1 experimental states and 17.283 in the control states, the drop of 2.945 weeks is clearly economically significant. We interpret this first result as fairly strong confirmation of the basic DeLeire and Acemoglu/Angrist finding that the legal requirements imposed by the ADA reduced disabled employment. But because we arrive at this result from a more fine-tuned categorization of the pre-ADA legal landscape at the state level and therefore are able to focus on the effects of the federal law in the states in which it is likely to have had the biggest impact, we are able to detect the decline in disabled employment by looking at disabled versus nondisabled workers as a whole, whereas DeLeire and Acemoglu/Angrist found effects only for some age and sex groups. (We perform such disaggregation by age and sex later in our analysis, but for now we focus on the overall set of disabled and nondisabled workers.)

The remaining two panels in Table 4 help to answer the central question motivating our work, which is the relative role played by "reasonable accommodations" requirements and traditional antidiscrimination prohibitions in reducing disabled employment. The second panel compares group 2 experimental states (those with traditional antidiscrimination prohibitions but no "reasonable accommodations" requirements prior to the ADA) to control states (which had both provisions prior to the ADA) and thus provides a measure of the effect of imposing just a "reasonable accommodations" requirement (given an existing traditional antidiscrimination prohibition). Our mean-based difference-in-difference-in-difference estimate here is -1.780 and is statistically significant at the 5% level. Thus, imposing a "reasonable accommodations" requirement

appears to reduce disabled employment to an economically as well as a statistically significant degree.

Meanwhile, the bottom panel in Table 4 compares group 1 experimental states (no pre-ADA legal regulation) and group 2 experimental states (traditional antidiscrimination prohibition but no “reasonable accommodations” requirement pre-ADA) and thus provides a measure of the effect of imposing just a traditional antidiscrimination prohibition (as this is the piece that was new for the group 1 experimental states, while the “reasonable accommodations” requirement was new for both groups). Because our three groups of states are mutually exclusive, this point estimate is simply the difference between the effects in the two previous panels, but the full calculation is nonetheless displayed in the bottom panel of Table 4. Our mean-based difference-in-difference-in-difference estimate is again negative ( $-1.165$ ), but in this case it is not statistically significant. This result, together with the comparison of group 2 experimental states and control states discussed in the preceding paragraph, provides some support for the conclusion that the ADA’s “reasonable accommodations” requirement plays a greater role in driving disemployment effects than does the law’s imposition of a traditional antidiscrimination prohibition.

Table A4 repeats the exercise in Table 4 using the alternative categorization of state laws (as including administrative “reasonable accommodations” requirements) reflected in Tables A1, 1b, and A2. Table A4 is similar to Table 4 in that all three of the panels show negative and economically significant point estimates for the effect of the ADA on disabled employment in comparing states in which the law was a greater versus a smaller innovation (experimental group 1 versus control, experimental group 2 versus control, and experimental group 1 versus experimental group 2). However, the tables differ in that two of the three point estimates are substantially smaller than in Table 4, and also in that none of the three estimates is statistically significant. The one point estimate whose magnitude is relatively stable across the two tables is the one comparing the group 1

and group 2 experimental states (the estimate measuring the effect of imposing a traditional antidiscrimination prohibition); this stability suggests that whether the group 2 experimental group does (Table 4) or does not (Table A4) include the states whose administrative regulations imposed a “reasonable accommodations” requirement does not alter the comparison between group 2 (traditional antidiscrimination prohibition) outcomes and group 1 (no pre-ADA legal regulation) outcomes. The effects of including administrative “reasonable accommodations” requirements are discussed more fully below in our discussion of regression results.

### **B. Regression Framework: Basic Results**

Table 5 moves to a regression framework for our difference-in-difference-in-difference estimation. We estimate equation (1) on several different samples and under different approaches to the categorization of pre-ADA state regimes (as including or not including administrative “reasonable accommodations” requirements). By the nature of the difference-in-difference-in-difference methodology we employ, our approach controls for national time trends, general trends in the employment of disabled versus nondisabled workers, state-specific effects, and interactions of each of these factors with the others. All regressions reported below also include demographic controls for age, race, sex, education, marital status, and union membership. Estimated coefficients on the demographic controls are not reported but are all of expected sign. Except where otherwise noted, the “pre-ADA” and “post-ADA” years are the same as in Table 4 above.

The first column of Table 5 reflects a regression that does not exploit any of the state law variation emphasized above and instead looks simply at the aggregate effect of the ADA on disabled versus nondisabled workers’ employment levels (a “difference-in-difference” approach). This approach is meant to mimic the approach taken through much of the DeLeire and Acemoglu/Angrist studies (although DeLeire uses a binary employment variable rather than a continuous weeks

worked variable as his dependent variable, and Acemoglu and Angrist incorporate certain state-level information some of their specification checks, as noted above). The coefficient on the ADA-disability interaction (ADA x DIS) in the regression reported in column (A) is negative and statistically significant, consistent with the results of DeLeire and Acemoglu/Angrist.

The second through fifth columns of Table 7 reflect our basic results from incorporating information on pre-ADA state-level regimes. Column (B) gives the results of estimating equation (1) for the categorization of states in Tables 1a-1c (based solely on statutory and judicially-imposed “reasonable accommodation” requirements); columns (C) and (D) do the same thing but alter the classification of one or two states, as discussed more fully in the notes to Table 1c; and column (E) gives the results of estimating equation (1) for the categorization of states in Tables A1, 1b, and A2 (based in incorporating information from administrative “reasonable accommodations” requirements). Columns (B) and (E) are thus the regression counterparts to Tables 4 and A4 above. The coefficients  $\beta_{11}$  and  $\beta_{12}$  on the triple interaction terms ADA x GR1 x DIS and ADA x GR2 x DIS, and the difference between these coefficients ( $\beta_{11} - \beta_{12}$ ), are the central coefficients of interest. Recall from section IV.A above that  $\beta_{11}$  is a measure of the effect of imposing both a “reasonable accommodations” requirement and a traditional antidiscrimination prohibition;  $\beta_{12}$  is a measure of the effect of imposing just a “reasonable accommodations” requirement (given an existing traditional antidiscrimination prohibition); and  $\beta_{11} - \beta_{12}$  is a measure of the effect of imposing just a traditional antidiscrimination prohibition.

In column (B) of Table 5, the estimated coefficients on the two triple interaction terms are both negative and highly statistically significant (at the 0.5% and near 1% levels respectively). Imposing both a “reasonable accommodations” requirement and a traditional antidiscrimination prohibition is estimated to reduce disabled employment by 3.429 weeks per year, while imposing just a “reasonable accommodations” requirement is estimated to reduce disabled employment by



2.453 weeks per year. These results are quite similar to the results in Table 4, although the magnitudes, especially of the second estimate, are somewhat larger in the regression framework. Also parallel to Table 4, the effect of imposing just a traditional antidiscrimination prohibition is both smaller (point estimate  $-0.975$ ) and not statistically significant. Taken together, these results suggest that imposition of a “reasonable accommodations” requirement has a stronger negative effect on disabled employment than imposition of a traditional antidiscrimination prohibition, and (not surprisingly) that imposition of both requirements produces the largest negative effect. Note that, once the state law information has been included, there is no longer a statistically significant effect of the ADA-disability interaction (which was both statistically and economically significant in column (A)); this provides further support for the way in which the effect of the ADA varied significantly depending on the pre-ADA state-level legal regime, a conclusion we believe bolsters DeLeire’s and Acemoglu and Angrist’s causal interpretations of the relationship between the ADA and disabled employment.

Column (E) of Table 5 looks similar in many respects to column (B), although the point estimates for two of the three coefficients of interest are substantially smaller in magnitude, and the estimates for  $\beta_{11}$  and  $\beta_{12}$  are no longer statistically significant (though the former is just shy of significance at the 10% level). These discrepancies between columns (B) and (E) mimic closely the differences between Tables 4 and A4 above; once administrative “reasonable accommodations” requirements are included in the “reasonable accommodations” category, the effect of imposing a “reasonable accommodations” requirement, not surprisingly, becomes less pronounced. Meanwhile, parallel to the comparison above of Tables 4 and A4, the estimated coefficient here on the effect of imposing a traditional antidiscrimination prohibition ( $\beta_{11} - \beta_{12}$ ) remains largely unchanged in magnitude across the two categorizations of state laws. Overall, the categorization of state-level legal regimes with information on administrative “reasonable accommodations” requirements seems

to produce noisier and somewhat smaller point estimates than the categorization based on statutory and judicial law. While most of the remainder of our analysis tracks the existing empirical literature on state employment laws in characterizing state-level legal regimes based on statutory and judicial law alone, it seems important to pause briefly here to consider the possible sources of the somewhat different outcomes based on different methods of characterizing state-level legal regimes.

We believe the most likely explanation for the apparently smaller effects of administrative “reasonable accommodations” requirements than those imposed by statutory or judicial law is that the administrative provisions at issue here are typically promulgated by the state civil rights agencies, at least some of which may be aggressively pro-employee in their views, and whose guidelines may in some instances not be followed by courts. There is an important parallel here at the federal level, where EEOC guidelines are not infrequently set aside by federal courts, as in a very recent Supreme Court decision involving the EEOC’s interpretation of the Family and Medical Leave Act (*Ragsdale v. Wolverine World Wide, Inc.*, 122 S. Ct. 1155 (2002)). A further point is that state-level administrative regulations may also simply be less visible to employers, managerial employees, and their attorneys. As a result of these various factors, states whose “reasonable accommodations” requirements are imposed through administrative regulations rather than through statutory or judicial law may more akin to group 2 experimental states (with only traditional antidiscrimination provisions) than to the states that had both statutory or judicial “reasonable accommodations” requirements and traditional antidiscrimination prohibitions prior to the ADA. The weaker estimates in Table A4 and in column (E) of Table 5 may, then, stem from an unexpected blurring of our control and group 2 experimental categories. At the same time, we cannot rule out the possibility that the categorization of states based on material appearing in administrative regulations is in fact the correct one; this would also call into question the large body of existing

empirical literature on state employment laws, none of which (to our knowledge) looks at state administrative regulations in studying state-level legal regimes.<sup>21</sup>

Table A5 reports results for the same regressions as Table 5 but with wages rather than employment as the dependent variable. (Only individuals who are employed are included in these regressions.) Consistent with the theoretical prediction offered in section II, and with DeLeire's and Acemoglu and Angrist's empirical evidence, we find little evidence of significant negative wage effects associated with the ADA. We will not discuss wage effects further below.

### **C. Regression Framework: Robustness Checks**

#### **1. Geographic and Size Limits of the Group 1 Experimental Category**

One important concern with the results reported thus far is that while both the control group and the group 2 experimental category are large and well balanced across the country, the group 1 experimental category is small and is made up entirely of three southern states (Alabama, Arkansas, and Mississippi). It is obvious (and may easily be confirmed by reestimating equation (1) on just the control and group 2 experimental states), that our estimate of  $\beta_{12}$ , which gives the effect of imposing a "reasonable accommodations" requirement, is not affected by anything about the group 1 experimental category; however, we do need the group 1 experimental category if we wish to estimate the effect of imposing a traditional antidiscrimination prohibition. The fact that all of the group 1 experimental states are from the south is an important concern because if there was some unobserved shock in that region between the pre- and post-ADA periods that differentially affected disabled and nondisabled workers, then any effect on relative disabled employment in the group 1

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<sup>21</sup> The state antidiscrimination law literature in the race and sex contexts (including Chay 1998, Collins 2001, Landes 1968, and Neumark and Stock 2001) appears to focus exclusively on statutory law, while the employment-at-will literature (such as Miles 2000) emphasizes judicial law. In the race and sex contexts, administrative regulations could be the source of doctrines such as the "disparate impact" branch of antidiscrimination law noted above, and thus, at least in theory, could have a substantial effect on the impact of the state-level legal regime.

experimental category versus the other categories could be reflecting that unobserved shock rather than the enactment of the ADA. The obvious strategy to address this issue is to reestimate equation (1) with just southern states from each of our three state groups.

Results of estimating equation (1) for a sample including Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia are reported in column (F) of Table 5. All three of the coefficients on the triple interaction terms remain negative and economically significant, and their relative magnitude ( $\beta_{11}$  largest,  $\beta_{12}$  middle-sized, and  $\beta_{11} - \beta_{12}$  smallest) is also the same. Not surprisingly, the substantially reduced sample size causes us to lose some power, although the point estimate for  $\beta_{11}$ , which measures the effect of imposing both a “reasonable accommodations” requirement and a traditional antidiscrimination prohibition, is almost significant at the 5% level, and the point estimate for  $\beta_{12}$ , which measures the effect of imposing just a “reasonable accommodations” requirement, remains significant at the 10% level. Although our estimates are understandably less precise when we reduce our sample to 11 states, the results suggest to us that a southern trend is not driving our findings.

## **2. The Role of Variation in “Disability” Definitions**

As noted in section III.A above, the pre-ADA state legal regimes examined in this paper varied in their approach to defining the protected category of “disabled” individuals. This variation could affect our results if the control, experimental group 1, and experimental group 2 groups differed systematically not only in their substantive provisions but also in their definitional approaches. To test for this possibility, we reestimate our basic regression (equation (1) above) on subsamples of states whose definitional provisions shared common attributes. The results are reported in columns (G), (H), and (I) of Table 5.

Column (G) reports results when only states whose definitions paralleled the ADA's definition in the two respects above (using the "regarded as" language and embracing mental as well as physical disability) are included (along with the three group 1 experimental states, which had no pre-ADA legal regimes and thus no definitions of "disability"). The results in these columns are very similar to those from the full sample (column (B)), although the point estimate for  $\beta_{12}$ , the effect of imposing just a "reasonable accommodations" requirement, is now just shy of significance at the 5% level. Columns (H) and (I), meanwhile, report results for subsamples that include, respectively, only states that included mental disability in their definitions (whether or not they also used the "regarded as" language) and only states that used the "regarded as" language (whether or not they also included mental disability); again, our results appear quite robust to these sample restrictions. Overall, columns (G), (H), and (I) of Table 5 provide strong support for the conclusion that definitional variation across states is not driving our results.

### 3. Controlling for Receipt of Disability Benefits

As noted earlier, the availability of federal disability benefits was changing at around the same time as the passage of the ADA (Bound and Waidmann 2000). This shift is of less concern for our study than for DeLeire's and Acemoglu and Angrist's work because our difference-in-difference framework looks at outcomes in one group of states *relative to* outcomes in others, and thus changes in federal benefits generosity should not matter much. Still, changes in federal disability benefits could affect our analysis if for some reason the changes differed systematically across our three state groups. Columns (J) and (K) of Table 5, however, show that our results do not change much when we exclude individuals who received federal disability benefits from the sample (column (J)) or add a dummy variable for benefits receipt (column (K)). We lose a bit of power (the point estimate for  $\beta_{11}$  in column (J) is just shy of significance at the 5% level), but

overall our results seem at least as robust to these controls for federal disability benefits as Acemoglu and Angrist's results were to these same controls.

#### 4. Results for Alternative Timing Assumptions

As described above, an important question in any inquiry into outcomes before and after a legal change is what counts as "before" and what counts as "after." We now consider the robustness of our results to alternative assumptions about where to draw these timing lines.

Comparing column (B) in Table 5 with column (A) in Table 6 shows the effect of moving from 1992-1993 to 1993-1994 as the "post-ADA" years. The estimated coefficients on  $\beta_{11}$  and  $\beta_{11} - \beta_{12}$  are fairly stable, although the standard errors are somewhat higher in Table 6. The estimated coefficient on  $\beta_{12}$  changes more in magnitude, but it remains negative and economically significant. Overall, these results suggest a reasonable, if not overwhelming, degree of robustness to moving the "after" line.

The robustness conclusion is bolstered by an examination of the results in column (C) of Table 7. This table replicates, for age and sex subsamples of our overall sample, the regressions reported in columns (A)-(B) of Table 5 and columns (A)-(E) of Table 6. To conserve space, we report only the estimated coefficients on the ADA-disability interaction, the estimated coefficients on the two triple interaction terms, and their difference ( $\beta_{11} - \beta_{12}$ ). As comparison of columns (B) and (C) (which reflect results for 1987/88-1992/93 and 1987/88-1993/94 respectively) of Table 7 show, the disaggregation displays a very high degree of robustness to moving the "post-ADA" line for individuals aged 21-39 (top panel), and also a fairly high degree of robustness to moving this line for men aged 21-58 (third panel) and women aged 21-39 (seventh panel). Column (B) of Table 7 also illustrates how our basic regression results change across population subgroups; like Acemoglu and Angrist, we find that disemployment effects of the ADA are greater for younger workers than

older ones and, within the category of older workers, greater for men than women.

While column (A) in Table 6 and column (C) in Table 7 show the results of moving the “post-ADA” line, column (B) in Table 6 and column (D) in Table 7 reflect the results of moving the “before” period from 1987-88 to 1988-89; and column (C) in Table 6 and column (E) in Table 7 provide the results for moving both the “before” and “after” lines together. Table 6 shows substantial movement in estimated coefficients for the overall group (comparing to column (B) in Table 5), but Table 7 (comparing column (B) with columns (D) and (E)) reveals some degree of robustness for several subgroups, including individuals aged 21-39 (for the estimated coefficients on  $\beta_{11}$  and  $\beta_{11} - \beta_{12}$ ), men aged 21-58 (again for the same estimated coefficients), and women aged 21-39 (again for the same estimated coefficients).

Column (D) in Table 6 and column (F) in Table 7 report the results of the final timing assumption we examine. As described above, Acemoglu and Angrist take the view that there were not significant “anticipation effects” in connection with the ADA. To test this idea, column (D) in Table 6 compares outcomes in 1990-91 (before the ADA’s effective date, but in the period in which it already would have been anticipated) with those in 1992-93. For comparison purposes, column (E) in Table 6 (as well as column (G) in Table 7) reports results for the same period but without exploiting any of the variation in state-level legal regimes. (Column (E) in Table 6 thus parallels column (A) in Table 5 but with different timing assumptions.) We think results are extremely interesting; while the ADA-disability interaction has a negative effect both in column (D) and in column (E) of Table 6 (and while this effect is statistically significant in a number of the subsamples analyzed in columns (F) and (G) of Table 7), the estimated coefficients on both of the triple interaction terms and their difference all flip to positive (Table 6 and most of the sub-samples analyzed in Table 7). These findings suggest to us that negative effects on disabled employment between 1990-91 (before the ADA’s effective date) and 1992-93 were *not* causally linked to the

ADA; instead the ADA-disability interaction appears to be picking up a spurious effect for the period.

#### **D. Composition of the Disabled Group**

One question that has received substantial attention in the recent literature on the effects of the ADA on disabled employment is the prospect of “composition bias.” The concern is that the group of individuals identifying themselves as disabled in response to the CPS survey question might have changed in shape or size between the pre- and post-ADA periods (however these periods are measured). Acemoglu and Angrist (2001:935) attempt to address this issue by rerunning their regressions on a matched sample from the 1993 and 1994 CPS (reflecting 1992 and 1993 data); however, as critics of this approach have noted (see Kruse and Schur 2001:7-8), the approach has obvious limits given the extreme shortness of the “panel” used to compare pre- and post-ADA outcomes and the way this panel straddles the CPS redesign. A further concern relates to the issues discussed above about whether 1992 can appropriately be treated as a “pre-ADA” year.

An advantage of the difference-in-difference-in-difference framework used in our work is that changes over time in the individuals identifying themselves as disabled in response to the CPS question cannot affect our analysis unless these changes vary depending on the pre-ADA legal regime of the state in which an individual lives. While overall changes certainly seem plausible, state-varying changes are less likely, although they are still conceivable; if, for instance, legal reform makes disability more socially acceptable and thus leads more people to identify themselves as disabled, changes in disability identification with the ADA could be more substantial in experimental states, in which the ADA was a more significant innovation, than in control states. Given our views of the timing issues discussed above, we do not see a lot of value in addressing this possibility through a “short panel” of the sort used by Acemoglu and Angrist. Nonetheless, we feel



quite confident that composition bias is not a significant concern. This is so because for composition changes to lead to our overstating the negative employment effects of the ADA for disabled workers, one of two things would have to be true. One possibility is that the legal reform makes individuals with worse employment prospects than the pre-ADA disabled individuals *more* likely to identify themselves as disabled (and this could produce an apparent disemployment effect for disabled workers)—yet in fact, if anything, one might think it would be those closest to the line between disability and nondisability, and thus those with relatively good employment prospects, who might switch from identifying as nondisabled to identifying as disabled with the legal reform. The other possibility (not discussed by Acemoglu and Angrist because at the national level (their focus) self-reported disability rates rose rather than fell in the 1990s) is that individuals with reasonably good employment prospects became *less* likely with the legal reform to identify themselves as disabled precisely because the reform helped them to obtain and retain jobs—but our data does not provides no suggestion of shrinkage or slower growth in the proportion of disabled individuals in experimental states than in control states.

## **VI. Conclusion**

State-level legal regimes governing employment discrimination on the basis of disability varied substantially before the enactment of the ADA. Exploiting this variation allows us to provide separate measures for the effects of “reasonable accommodations” requirements and traditional antidiscrimination prohibitions on disabled employment. The state-level variation we emphasize also provides a further check on existing studies that suggest a causal link between the passage of the ADA and declines in disabled employment. Our findings suggest that “reasonable accommodations” requirements played a bigger role than traditional antidiscrimination prohibitions in reducing disabled employment after the ADA. Our findings also suggest, given the pattern of

effects across state groups depending on the pre-ADA legal regime, that the legal requirements imposed by the ADA were causally linked to the declines in disabled employment. Our results prove robust to a variety of specification checks but are somewhat sensitive to inclusion versus exclusion of administrative “reasonable accommodations” requirements.

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**Table 1a: Pre-ADA Employment Discrimination Laws Protecting Disabled Workers – Control States**

	Statutory section	Traditional antidiscrimination prohibition--date adopted	"Reasonable accommodations" requirement--date adopted	Case law**
Arizona	41-1463(B)	1985	1985	
Colorado	24-34-402(1)(a)	1979*	1979*.††	√
Delaware	19:723(b), 724(a)	1988†	1988†	
Idaho	67-5909(1)	1988†	1988†	
Louisiana	46:2254(A), (C)	1980	1980	√‡
Massachusetts	151B:4(16)	1983	1983	√‡
Minnesota	363.03:1(2), (6)	1979	1983†††	√
New Mexico	28-1-7(A), (J)	1978*	1983	
North Carolina	168A-4, 5	1985	1985	
Oregon	659.425(1)	1973	1979*	√
Rhode Island	28-5-7(1)	1987*	1987*	
Vermont	21:495(a)(1), 495d(6)	1981	1981	√
Virginia	51.5-41(A), (C)	1985*	1985*	√‡
Washington	49.60.180(1)	1973*	1978*.††††	√
Wisconsin	111.34(1)(b), 321, 322(1)	1973*	1981	√
Wyoming	27-9-105(a), (d)	1985*	1985*	

\* Date is an upper bound on the adoption date; adoption may have been earlier.

\*\* Case law in this table involves the "reasonable accommodations" requirement.

† Results are not affected by categorization of states whose disability discrimination laws were not adopted until 1988 as group 1 experimental states (those with no pre-ADA regimes) rather than control states. In addition to its late adoption date, Idaho's statute is somewhat ambiguous as to the existence of a "reasonable accommodations" requirement, but results are not affected by its categorization as a group 2 experimental state (one with only a traditional antidiscrimination prohibition) rather than a control state.

†† Statutory language is somewhat ambiguous but is clarified by an administrative regulation, 3 Code Reg. 708-1, 60.2(C).

††† Applicable only to employers with 50 or more employees.

†††† Judicial interpretation: *Holland v. Boring Co.*, 583 P.2d 621 (Wash. 1978).

‡ One reported case only.

**Table 1b: Pre-ADA Employment Discrimination Laws Protecting Disabled Workers – Group 1 Experimental States**

	Statutory section	Traditional antidiscrimination prohibition--date adopted	"Reasonable accommodations" requirement--date adopted	Case law
Alabama	n/a	n/a	n/a	n/a
Arkansas	n/a	n/a	n/a	n/a
Mississippi	n/a	n/a	n/a	n/a

**Table 1c: Pre-ADA Employment Discrimination Laws Protecting Disabled Workers – Group 2 Experimental States**

	Statutory section	Traditional antidiscrimination prohibition--date adopted	"Reasonable accommodations" requirement--date adopted	Case law
Alaska	18.80.220(a)(1)	1987*	n/a	
California	Govt. 12940(a), 12994	1980*	n/a	√
Connecticut	46a-60(a)(1)	1973 <sup>†</sup>	n/a	√
Florida	760.10(1)	1977	n/a	√
Georgia	34-6A-4(a)	1981 <sup>†</sup>	n/a	√
Hawaii	378-2(1)	1986*	n/a	
Illinois	68:1-103(Q), 2-102(A)	1975*	n/a	√
Indiana	22-9-1-2, 22-9-1-3(I)	1975	n/a	√
Iowa	601A.6(1)(a)	1965	n/a	√
Kansas	44-1009(a)(1)	1974*	n/a	√
Kentucky	207.150(1)	1976 <sup>†</sup>	n/a	√
Maine	5:4572(1)(A)	1973 <sup>†</sup>	n/a	√
Maryland	49B:16(a)	1974	n/a	√
Michigan	37.1102(2), 1202(1)	1976	n/a <sup>+++</sup>	√
Missouri	213.055.1(1)	1978*	n/a	√
Montana	49-2-203(a)	1983*	n/a	√ <sup>‡</sup>
Nebraska	48-1104	1977*	n/a	√
Nevada	613.330(1)	1981*	n/a <sup>++++</sup>	
New Hampshire	354-A:8(I)	1975	n/a	
New Jersey	10:5-4.1, -29.1	1972	n/a	√
New York	Exec. 296(1)(a)	1974	n/a	√
North Dakota	14-02.4-03	1983*	n/a <sup>++++</sup>	
Ohio	4112.02(A)	1980*	n/a	√
Oklahoma	25:1302(A)	1981*	n/a	
Pennsylvania	43:954(a), (b)	1974	n/a	√
South Carolina	43-33-530	1983	n/a	
South Dakota	20-13-10, 23.7	1986*	n/a <sup>+++</sup>	
Tennessee	8-50-103	1976 <sup>†</sup>	n/a	√
Texas	Civ. Art. 5221k, 5.01	1975 <sup>††</sup>	n/a <sup>+++++</sup>	√
Utah	34-35-6(1)(a)	1979*	n/a	√ <sup>‡</sup>
West Virginia	5-11-9(a)(1)	1981*	n/a	√

\*<sup>‡</sup> See corresponding notes in Table 1a.

<sup>†</sup> Amended: See Tables A1 and A2 for details.

<sup>††</sup> Initially adopted as Hum. Res. Code 121.003(f).

<sup>+++</sup> Limited accommodation provisions (not imposing an express requirement of "reasonable accommodations") were adopted by Michigan and South Dakota in 1980 and 1986 respectively. Results when these states are categorized as control states rather than group 2 experimental states are reported in column (C) of Table 5.

<sup>++++</sup> Specific requirement that employers permit visually or aurally handicapped employees to have guide or hearing dogs (613.330(6)). Results are not affected by the categorization of Nevada as a control state rather than a group 2 experimental state.

<sup>+++++</sup> Accommodation requirement added in 1989. In alternative specifications in which 1989 or later years are included in the "pre-ADA" period, North Dakota is therefore categorized as a control state rather than a group 2 experimental state; however, results in these specifications are not affected by categorization of it (given its relatively late adoption date for its "reasonable accommodations" provision) as a group 2 experimental state rather than a control state.

<sup>+++++</sup> Remedy provisions of the Texas statute refer to reasonable accommodations (Civ. Art. 5221k, 6.01(d) and 7.01(f)). Results when Texas is categorized as a control state rather than a group 2 experimental state are reported in column (D) of Table 5.

**Table 2: Definitions of “Disability” Under Pre-ADA Employment Discrimination Laws Protecting Disabled Workers**

<i>States with ADA-like definitions</i>	<i>States that included mental conditions but did not use “regarded as” language</i>
Alaska	Connecticut
Delaware	Florida
Hawaii	Georgia
Idaho	Indiana
Illinois	Iowa
Louisiana	Maine
Massachusetts	Maryland
Minnesota	Michigan
Missouri	Montana
New Mexico	Nebraska
New York	New Hampshire
North Carolina	New Jersey
North Dakota	Ohio
Oklahoma	Oregon
Pennsylvania	South Carolina
Rhode Island	South Dakota
Vermont	Texas
West Virginia	Utah
Wisconsin	Virginia
Wyoming	Washington
<i>States that used “regarded as” language but did not include mental conditions</i>	<i>States that neither used “regarded as” language nor included mental conditions</i>
Colorado	Arizona
	California
	Kansas
	Kentucky

Note: Two group 2 experimental states, Nevada and Tennessee, did not provide pre-ADA definitions of “disability.”

**Table 3: Descriptive Statistics (Men & Women -- Ages 21-58)**

	1987		1988		1989		1990	
	Disabled (1)	Nondisabled (2)	Disabled (3)	Nondisabled (4)	Disabled (5)	Nondisabled (6)	Disabled (7)	Nondisabled (8)
<b>Age</b>	42.1	36.9	42.5	36.9	42.5	37.1	42.2	37.2
<b>White</b>	0.83	0.88	0.84	0.88	0.84	0.87	0.83	0.87
<b>Post-High School</b>	0.24	0.44	0.23	0.44	0.24	0.46	0.26	0.46
<b>Working</b>	0.44	0.87	0.45	0.88	0.46	0.87	0.43	0.87
<b>Weeks Worked</b>	16.3	40.2	16.4	40.8	17.2	40.8	15.9	40.6
<b>Weekly Wage</b>	\$281.51	\$385.19	\$307.18	\$397.20	\$308.05	\$422.25	\$314.30	\$433.39
<b>SSI/DI</b>	0.32	0.01	0.33	0.01	0.32	0.01	0.34	0.01
<b>Obs.</b>	4,716	73,220	4,396	67,907	4,884	74,616	5,025	74,980
	1991		1992		1993		1994	
	Disabled (9)	Nondisabled (10)	Disabled (11)	Nondisabled (12)	Disabled (13)	Nondisabled (14)	Disabled (15)	Nondisabled (16)
<b>Age</b>	42.2	37.3	42.1	37.5	42.6	37.6	43.0	37.8
<b>White</b>	0.83	0.87	0.84	0.86	0.81	0.86	0.79	0.84
<b>Post-High School</b>	0.29	0.50	0.31	0.52	0.31	0.54	0.32	0.54
<b>Working</b>	0.43	0.87	0.43	0.87	0.41	0.87	0.41	0.87
<b>Weeks Worked</b>	15.9	40.4	15.8	40.3	15.1	40.5	14.7	40.9
<b>Weekly Wage</b>	\$334.64	\$447.01	\$316.66	\$461.59	\$347.44	\$480.72	\$375.83	\$507.55
<b>SSI/DI</b>	0.35	0.01	0.38	0.02	0.39	0.02	0.38	0.02
<b>Obs.</b>	5,100	74,192	5,311	73,525	5,307	70,999	5,336	70,686

Note: Descriptive Statistics are unweighted.



**Table 3 (Continued): Men Aged 21-39**

	1987		1988		1989		1990	
	Disabled (1)	Nondisabled (2)	Disabled (3)	Nondisabled (4)	Disabled (5)	Nondisabled (6)	Disabled (7)	Nondisabled (8)
Age	31.1	30.0	31.3	30.1	31.3	30.2	31.2	30.2
White	0.86	0.88	0.85	0.88	0.84	0.88	0.83	0.88
Post-High School	0.28	0.47	0.26	0.48	0.26	0.47	0.24	0.46
Working	0.57	0.96	0.60	0.96	0.60	0.96	0.54	0.96
Weeks Worked	21.3	45.3	21.0	45.7	22.8	45.8	20.1	45.3
Weekly Wage	\$295.15	\$417.83	\$314.06	\$431.51	\$304.86	\$455.29	\$331.94	\$459.68
SSI/DI	0.308	0.005	0.312	0.005	0.294	0.005	0.334	0.005
Obs.	1,049	21,316	914	19,893	986	21,618	1,039	21,390

	1991		1992		1993		1994	
	Disabled (9)	Nondisabled (10)	Disabled (11)	Nondisabled (12)	Disabled (13)	Nondisabled (14)	Disabled (15)	Nondisabled (16)
Age	31.6	30.2	31.3	30.3	31.6	30.4	31.8	30.5
White	0.83	0.87	0.83	0.86	0.80	0.86	0.81	0.84
Post-High School	0.28	0.50	0.30	0.52	0.30	0.52	0.30	0.52
Working	0.53	0.95	0.53	0.95	0.50	0.95	0.50	0.95
Weeks Worked	19.2	44.3	19.7	44.1	18.6	44.4	18.3	44.7
Weekly Wage	\$371.60	\$468.00	\$335.93	\$478.49	\$347.16	\$494.74	\$380.88	\$530.18
SSI/DI	0.341	0.006	0.361	0.007	0.362	0.006	0.374	0.006
Obs.	1,054	21,086	1,093	20,542	1,046	19,583	926	19,223

**Table 3 (Continued): Women Aged 21-39**

	1987		1988		1989		1990	
	Disabled (1)	Nondisabled (2)	Disabled (3)	Nondisabled (4)	Disabled (5)	Nondisabled (6)	Disabled (7)	Nondisabled (8)
Age	31.1	30.0	31.7	30.1	31.3	30.2	31.5	30.2
White	0.81	0.86	0.84	0.86	0.84	0.85	0.83	0.85
Post-High School	0.26	0.45	0.25	0.46	0.28	0.47	0.28	0.47
Working	0.51	0.79	0.52	0.80	0.56	0.80	0.52	0.79
Weeks Worked	18.1	34.5	17.5	35.2	19.8	34.9	17.7	34.7
Weekly Wage	\$205.30	\$276.55	\$220.06	\$284.16	\$239.68	\$307.75	\$228.35	\$321.11
SSI/DI	0.271	0.015	0.285	0.015	0.270	0.018	0.283	0.017
Obs.	917	23,702	822	21,801	919	23,762	956	23,535

	1991		1992		1993		1994	
	Disabled (9)	Nondisabled (10)	Disabled (11)	Nondisabled (12)	Disabled (13)	Nondisabled (14)	Disabled (15)	Nondisabled (16)
Age	31.4	30.3	31.6	30.4	32.2	30.4	31.9	30.4
White	0.85	0.82	0.83	0.84	0.80	0.83	0.77	0.82
Post-High School	0.32	0.51	0.34	0.53	0.36	0.55	0.37	0.56
Working	0.53	0.79	0.48	0.79	0.45	0.79	0.45	0.80
Weeks Worked	18.2	34.8	16.5	34.8	15.2	34.7	14.7	35.3
Weekly Wage	\$249.18	\$330.71	\$254.43	\$344.68	\$266.93	\$356.97	\$273.70	\$372.45
SSI/DI	0.290	0.016	0.323	0.019	0.353	0.023	0.352	0.023
Obs.	958	23,222	1,063	22,551	994	21,633	985	21,148

Note: Descriptive Statistics are unweighted.

**Table 3 (Continued): Men Aged 40-58**

	1987		1988		1989		1990	
	Disabled (1)	Nondisabled (2)	Disabled (3)	Nondisabled (4)	Disabled (5)	Nondisabled (6)	Disabled (7)	Nondisabled (8)
Age	49.8	47.9	49.5	47.8	49.4	47.7	49.2	47.7
White	0.83	0.90	0.85	0.90	0.84	0.89	0.85	0.89
Post-High School	0.24	0.45	0.25	0.46	0.24	0.48	0.25	0.49
Working	0.42	0.97	0.42	0.97	0.42	0.97	0.42	0.96
Weeks Worked	16.1	47.5	16.5	47.7	17.0	47.9	15.9	47.4
Weekly Wage	\$393.50	\$559.94	\$432.20	\$580.50	\$416.59	\$604.73	\$400.20	\$613.00
SSI/DI	0.368	0.008	0.361	0.008	0.362	0.009	0.380	0.010
Obs.	1,379	13,609	1,329	12,598	1,476	14,030	1,467	14,450

	1991		1992		1993		1994	
	Disabled (9)	Nondisabled (10)	Disabled (11)	Nondisabled (12)	Disabled (13)	Nondisabled (14)	Disabled (15)	Nondisabled (16)
Age	49.0	47.6	49.1	47.6	49.3	47.6	49.1	47.7
White	0.86	0.89	0.86	0.89	0.84	0.88	0.82	0.87
Post-High School	0.28	0.54	0.33	0.55	0.32	0.57	0.32	0.58
Working	0.41	0.96	0.41	0.95	0.38	0.96	0.39	0.96
Weeks Worked	15.6	47.0	16.1	46.7	14.4	46.8	14.6	47.3
Weekly Wage	\$414.19	\$632.73	\$374.18	\$648.93	\$433.66	\$680.33	\$521.83	\$710.91
SSI/DI	0.401	0.009	0.424	0.012	0.428	0.009	0.418	0.010
Obs.	1,523	14,444	1,619	14,596	1,575	14,202	1,648	14,546

**Table 3 (Continued): Women Aged 40-58**

	1987		1988		1989		1990	
	Disabled (1)	Nondisabled (2)	Disabled (3)	Nondisabled (4)	Disabled (5)	Nondisabled (6)	Disabled (7)	Nondisabled (8)
Age	50.0	47.9	49.9	47.8	49.9	47.7	49.5	47.7
White	0.81	0.88	0.82	0.88	0.82	0.87	0.80	0.87
Post-High School	0.20	0.35	0.19	0.37	0.19	0.39	0.26	0.40
Working	0.32	0.76	0.34	0.77	0.34	0.78	0.33	0.79
Weeks Worked	11.6	35.0	12.5	36.1	12.1	36.4	12.0	36.7
Weekly Wage	\$197.09	\$301.62	\$227.49	\$310.87	\$247.70	\$338.23	\$276.15	\$356.47
SSI/DI	0.315	0.027	0.339	0.027	0.316	0.026	0.351	0.025
Obs.	1,371	14,593	1,331	13,615	1,503	15,206	1,563	15,605

	1991		1992		1993		1994	
	Disabled (9)	Nondisabled (10)	Disabled (11)	Nondisabled (12)	Disabled (13)	Nondisabled (14)	Disabled (15)	Nondisabled (16)
Age	49.3	47.7	49.5	47.7	49.4	47.6	49.4	47.7
White	0.83	0.87	0.82	0.86	0.79	0.86	0.77	0.85
Post-High School	0.27	0.45	0.27	0.47	0.29	0.50	0.31	0.51
Working	0.33	0.79	0.33	0.80	0.35	0.81	0.36	0.81
Weeks Worked	12.4	37.2	12.1	37.6	13.6	38.0	13.0	38.0
Weekly Wage	\$283.19	\$376.08	\$281.80	\$392.91	\$321.36	\$412.29	\$297.19	\$430.92
SSI/DI	0.353	0.022	0.375	0.025	0.379	0.025	0.366	0.026
Obs.	1,565	15,440	1,536	15,836	1,692	15,581	1,777	15,769

Note: Descriptive Statistics are unweighted.

**Table 4: Difference-in-Difference-in-Difference Analysis for Three State Groups – Categorization Based on Statutory and Judicial Law (Tables 1a-1c)**

MEAN EMPLOYMENT LEVELS – Group 1 Experimental States versus Control States							
Location	Before ADA	After ADA	Time Diff. for Location	Location	Before ADA	After ADA	Time Diff. for Location
<b>Disabled Individuals</b>				<b>Nondisabled Individuals</b>			
<i>Group 1 Experimental States</i>	12.671 0.97	11.112 0.89	-1.559 1.32	<i>Group 1 Experimental States</i>	39.250 0.29	40.344 0.28	1.094 0.40
<i>Control States</i>	17.283 0.53	18.179 0.54	0.896 0.76	<i>Control States</i>	41.367 0.12	41.972 0.12	0.605 0.16
<b>Location Difference</b> (point in time)	-4.612 1.11	-7.068 1.04		<b>Location Difference</b> (point in time)	-2.117 0.31	-1.627 0.31	
<b>Difference-in-difference:</b>		-2.455 1.52		<b>Difference-in-difference:</b>		0.489 0.44	
<b>Difference-in-difference-in-difference:</b>		-2.945 1.58					

MEAN EMPLOYMENT LEVELS -- Group 2 Experimental States versus Control States							
Location	Before ADA	After ADA	Time Diff. for Location	Location	Before ADA	After ADA	Time Diff. for Location
<b>Disabled Individuals</b>				<b>Nondisabled Individuals</b>			
<i>Group 2 Experimental States</i>	16.065 0.31	14.486 0.28	-1.579 0.42	<i>Group 2 Experimental States</i>	40.334 0.07	40.244 0.07	-0.090 0.10
<i>Control States</i>	17.283 0.53	18.179 0.54	0.896 0.76	<i>Control States</i>	41.367 0.12	41.972 0.12	0.605 0.16
<b>Location Difference</b> (point in time)	-1.218 0.62	-3.693 0.61		<b>Location Difference</b> (point in time)	-1.033 0.14	-1.728 0.14	
<b>Difference-in-difference:</b>		-2.475 0.87		<b>Difference-in-difference:</b>		-0.695 0.19	
<b>Difference-in-difference-in-difference:</b>		-1.780 0.89					

MEAN EMPLOYMENT LEVELS – Group 1 Experimental States versus Group 2 Experimental States							
Location	Before ADA	After ADA	Time Diff. for Location	Location	Before ADA	After ADA	Time Diff. for Location
<b>Disabled Individuals</b>				<b>Nondisabled Individuals</b>			
<i>Group 1 Experimental States</i>	12.671 0.97	11.112 0.89	-1.559 1.32	<i>Group 1 Experimental States</i>	39.250 0.29	40.344 0.28	1.094 0.40
<i>Group 2 Experimental States</i>	16.065 0.31	14.486 0.28	-1.579 0.42	<i>Group 2 Experimental States</i>	40.334 0.07	40.244 0.07	-0.090 0.10
<b>Location Difference</b> (point in time)	-3.395 1.02	-3.37 0.93		<b>Location Difference</b> (point in time)	-1.084 0.30	0.101 0.29	
<b>Difference-in-difference:</b>		0.020 1.38		<b>Difference-in-difference:</b>		1.185 0.42	
<b>Difference-in-difference-in-difference:</b>		-1.165 1.44					

Notes: All estimates are weighted using CPS survey weights. Standard errors are reported beneath mean estimates. "Before ADA" years are 1987 & 1988. "After ADA" years are 1992 & 1993. The control group, experimental group 1, and experimental group 2 are defined in Section III.A of the text.

**Table 5 – Basic Regression Results**  
(Men and Women – Ages 21 - 58)

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
<b>ADA</b>	-0.426 0.23	0.003 0.30	-0.026 0.25	0.050 0.23	-0.454 0.35	0.071 0.36	-0.006 0.50	-0.009 0.34	0.026 0.45	-0.034 0.30	0.044 0.29
<b>DIS</b>	-22.35 0.40	-22.67 0.92	-22.44 0.79	-22.34 0.76	-22.02 0.50	-25.80 0.31	-22.60 1.30	-22.78 1.05	-22.40 1.19	-18.14 0.95	-18.13 0.63
<b>ADA * GR1</b>		-0.030 0.31	-0.001 0.27	-0.079 0.25	0.424 0.34	-0.029 0.42	-0.012 0.52	0.027 0.35	-0.038 0.47	0.630 0.30	0.012 0.31
<b>ADA * GR2</b>		-0.562 0.39	-0.554 0.37	-0.683 0.35	0.037 0.41	-0.360 0.66	-0.147 0.60	-0.348 0.40	-0.176 0.56	-0.567 0.39	-0.563 0.39
<b>ADA * DIS</b>	-1.315 0.34	0.662 0.79	0.067 0.84	-0.114 0.89	-0.918 0.48	-0.410 0.57	0.292 0.99	0.372 0.80	0.182 0.91	2.490 1.03	1.680 0.69
<b>SS Payments</b>											-16.29 0.28
<b>ADA*GR1*DIS</b>		-3.429 1.29	-2.834 1.32	-2.652 1.36	-1.849 1.14	-2.396 1.25	-3.100 1.42	-3.165 1.30	-2.986 1.36	-3.668 1.91	-2.910 1.02
<b>ADA*GR2*DIS</b>		-2.453 0.87	-1.796 0.92	-1.562 0.96	-0.792 0.71	-1.892 1.10	-2.312 1.28	-2.281 0.91	-2.204 1.22	-3.921 1.14	-2.850 0.75
$\beta_{11}-\beta_{12}$		-0.975 1.09	-1.038 1.09	-1.090 1.09	-1.057 1.16	-0.504 1.47	-0.788 1.30	-0.884 1.12	-0.782 1.30	0.253 1.67	-0.063 0.82
<b>Obs.</b>	285,979	285,979	285,979	285,979	285,979	48,728	134,415	251,256	137,706	275,558	285,979

Notes: All regressions are weighted using CPS survey weights. Robust standard errors are reported immediately under each estimate. Dependent variable is weeks employed per year. Estimate of  $\beta_{11} - \beta_{12}$  is based on estimated coefficients of  $\beta_{11}$  and  $\beta_{12}$  given in the two preceding rows.

Column (A) presents estimates of an OLS regression run on a sample of all 50 states for years 1987/1988 (before years) and 1992/1993 (after years).

Column (B) presents estimates of equation (1) from the text for years 1987/1988 (before years) and 1992/1993 (after years) using the categorization of states reflected in Tables 1a-1c.

Column (C) presents the same specification as in column (B) except that Michigan and South Dakota are categorized as control states (those with both "reasonable accommodations" requirements and traditional antidiscrimination prohibitions pre-ADA). See notes to Table 1c.

Column (D) presents the same specification as in column (B) except that Texas is categorized as a control state. See notes to Table 1c.

Column (E) presents the same specification as in column (B) except that the categorization of states from Tables A1, 1b, and A2 is used.

Column (F) runs the specification of column (B) on Southern states only.

Column (G) presents the same specification as in column (B) except that all states that did not define someone as disabled if that person were only "regarded as" disabled or were only mentally disabled were dropped. Thus, the sample consists of states that included those "regarded as" disabled or those with mental disabilities in their coverage.

Column (H) presents the same specification as in column (B) except that all states that did not define someone as disabled if that person were only mentally disabled were dropped. Thus, the sample consists of states that included those with mental disabilities in their coverage (whether or not they included those "regarded as" disabled).

Column (I) presents the same specification as in column (B) except that all states that did *not* define someone as disabled if that person were only "regarded as" disabled were dropped. Thus, the sample consists of states that included those "regarded as" disabled in their coverage (whether or not they included those with mental disabilities).

Column (J) presents the same specification as in column (B) except that all OASDI payment recipients have been dropped.

Column (K) presents the same specification as in column (B) except that a dummy variable for OASDI reciprocity has been included.

**Table 6 – Regression Results for Alternative Timing Assumptions**  
(Men and Women – Ages 21 - 58)

	(A)	(B)	(C)	(D)	(E)
<b>ADA</b>	0.148 0.29	-0.152 0.26	-0.009 0.27	0.077 0.09	-0.336 0.09
<b>DIS</b>	-22.723 0.93	-21.534 1.05	-21.580 1.06	-20.741 1.28	-22.931 0.50
<b>ADA * GR1</b>	0.182 0.39	-0.366 0.27	-0.152 0.45	-0.256 0.25	
<b>ADA * GR2</b>	-0.459 0.41	-0.703 0.34	-0.598 0.37	-0.533 0.13	
<b>ADA * DIS</b>	-0.602 0.89	-0.473 0.52	-1.750 0.80	-1.224 0.74	-0.684 0.43
<b>ADA*GR1*DIS</b>	-2.947 1.98	-0.947 1.06	-0.466 1.84	2.096 1.26	
<b>ADA*GR2*DIS</b>	-1.453 1.00	-1.101 0.71	-0.090 0.93	0.613 0.91	
$\beta_{11}-\beta_{12}$	-1.494 1.82	0.154 1.03	-0.375 1.73	1.482 1.13	
<b>Obs.</b>	283,043	286,796	283,860	292,290	292,290

Notes: All regressions are weighted using CPS survey weights. Robust standard errors are reported immediately under each estimate. Dependent variable is weeks employed per year. Estimate of  $\beta_{11} - \beta_{12}$  is based on estimated coefficients of  $\beta_{11}$  and  $\beta_{12}$  given in the two preceding rows.

Columns (A), (B), (C) and (D) present the same specification as in [Table 7, column \(B\)](#) but using different ranges of data: 1987/1988 & 1993/1994 (column (A)); 1988/1989 & 1992/1993 (column (B)); 1988/1989 & 1993/1994 (column (C)); 1990/1991 & 1992/1993 (column (D)).

Column (E) presents the specification of [Table 7, column \(A\)](#) using the before-after dates of column (D).

**Table 7: Regression Results for Population Subgroups**

<b>Men and Women -- Ages 21 - 39</b>							
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
ADA * DIS	-1.414 0.53	0.694 1.04	-0.379 1.23	-2.427 0.96	-3.514 1.14	-2.379 1.30	-1.365 0.59
ADA*GR1*DIS		-7.072 1.73	-6.798 1.92	-4.059 1.35	-3.800 1.80	1.715 2.24	
ADA*GR2*DIS		-2.479 1.19	-2.287 1.39	0.432 1.22	0.639 1.34	1.300 1.47	
$\beta_{11}-\beta_{12}$		-4.593 1.51	-4.510 1.62	-4.491 1.22	-4.439 1.57	0.415 1.94	
Obs.	166,470	166,470	163,400	166,236	163,166	167,569	167,569
<b>Men and Women -- Ages 40 - 58</b>							
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
ADA * DIS	-1.255 0.43	0.418 1.12	-0.832 0.99	0.321 0.82	-0.948 0.76	-0.438 1.05	-0.354 0.54
ADA*GR1*DIS		-1.064 2.06	-0.668 2.27	1.172 1.61	1.581 2.01	2.080 1.70	
ADA*GR2*DIS		-2.163 1.20	-0.640 1.11	-1.656 0.97	-0.125 0.94	-0.012 1.24	
$\beta_{11}-\beta_{12}$		1.100 1.79	-0.028 2.10	2.828 1.48	1.706 1.93	2.092 1.48	
Obs.	119,509	119,509	119,643	120,560	120,694	124,721	124,721
<b>Men -- Ages 21 - 58</b>							
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
ADA * DIS	-0.695 0.46	0.484 1.18	-1.169 0.87	-0.265 0.83	-1.928 0.65	-1.327 0.93	-0.278 0.60
ADA*GR1*DIS		-2.976 1.95	-2.039 2.65	-2.000 1.26	-1.067 2.00	1.992 1.25	
ADA*GR2*DIS		-1.377 1.29	-0.675 1.06	-0.438 1.11	0.274 1.08	1.292 1.18	
$\beta_{11}-\beta_{12}$		-1.599 1.64	-1.364 2.57	-1.562 1.20	-1.341 2.08	0.700 1.10	
Obs.	137,100	137,100	135,564	137,462	135,926	140,076	140,076
<b>Women -- Ages 21 - 58</b>							
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
ADA * DIS	-1.966 0.42	0.629 0.73	-0.466 1.28	-0.594 0.72	-1.702 1.16	-0.956 0.99	-0.876 0.44
ADA*GR1*DIS		-2.904 1.27	-2.780 1.88	0.409 1.55	0.532 2.07	1.515 1.80	
ADA*GR2*DIS		-3.320 0.86	-1.968 1.41	-1.730 0.86	-0.370 1.31	0.039 1.12	
$\beta_{11}-\beta_{12}$		0.416 1.14	-0.812 1.50	2.139 1.44	0.902 1.81	1.475 1.58	
Obs.	148,879	148,879	147,479	149,334	147,934	152,214	152,214

Notes: Regressions reported in columns (A)-(B) replicate, for the specified population subgroup, the regressions reported in columns (A)-(B) in Table 5. Regressions reported in columns (C)-(G) replicate, for the specified population subgroup, the regressions reported in columns (A)-(E) in Table 6. See notes to Tables 5 and 6 for further details.

**Table 7 (Continued): Regression Results for Population Subgroups**

<b>Men -- Ages 21 - 39</b>							
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
ADA * DIS	-0.271 0.77	0.440 1.65	0.029 1.57	-2.171 1.66	-2.588 1.35	-1.855 1.57	0.163 0.80
ADA*GR1*DIS		-2.520 3.62	-0.657 4.23	-2.513 1.74	-0.675 1.45	1.793 1.99	
ADA*GR2*DIS		-0.718 1.87	-1.683 1.78	1.631 1.93	0.674 1.65	2.724 1.82	
$\beta_{11}-\beta_{12}$		-1.802 3.34	1.027 4.02	-4.144 1.10	-1.348 1.11	-0.931 1.52	
Obs.	79,534	79,534	77,979	79,457	77,902	80,039	80,039
<b>Men -- Ages 40 - 58</b>							
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
ADA * DIS	-0.692 0.59	0.785 1.31	-1.728 1.10	1.176 1.03	-1.348 0.89	-0.465 1.26	-0.555 0.70
ADA*GR1*DIS		-3.737 1.53	-3.306 1.64	-2.065 1.87	-1.609 2.22	0.960 1.52	
ADA*GR2*DIS		-1.760 1.49	0.298 1.39	-1.940 1.31	0.124 1.33	-0.248 1.54	
$\beta_{11}-\beta_{12}$		-1.977 1.04	-3.604 1.47	-0.125 1.76	-1.733 2.26	1.207 1.22	
Obs.	57,566	57,566	57,585	58,005	58,024	60,037	60,037
<b>Women -- Ages 21 - 39</b>							
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
ADA * DIS	-3.078 0.74	-0.140 1.05	-1.718 1.92	-3.206 1.29	-4.808 2.05	-3.368 1.12	-3.178 0.84
ADA*GR1*DIS		-8.213 2.11	-10.202 1.97	-3.188 2.86	-5.176 3.57	1.238 2.48	
ADA*GR2*DIS		-3.548 1.37	-2.454 2.13	-0.289 1.52	0.822 2.21	0.147 1.57	
$\beta_{11}-\beta_{12}$		-4.665 2.03	-7.748 1.05	-2.899 2.67	-5.998 3.03	1.091 2.46	
Obs.	86,936	86,936	85,421	86,779	85,264	87,530	87,530
<b>Women -- Ages 40 - 58</b>							
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
ADA * DIS	-1.599 0.54	0.559 1.17	0.066 1.13	0.094 1.18	-0.405 0.93	0.240 1.40	0.211 0.64
ADA*GR1*DIS		1.124 3.65	1.499 3.07	3.518 2.28	3.878 1.85	2.258 2.70	
ADA*GR2*DIS		-2.908 1.32	-1.614 1.30	-1.869 1.32	-0.579 1.21	-0.105 1.60	
$\beta_{11}-\beta_{12}$		4.032 3.51	3.112 2.94	5.387 2.02	4.457 1.78	2.363 2.42	
Obs.	61,943	61,943	62,058	62,555	62,670	64,684	64,684

Notes: Regressions reported in columns (A)-(B) replicate, for the specified population subgroup, the regressions reported in columns (A)-(B) in Table 5. Regressions reported in columns (C)-(G) replicate, for the specified population subgroup, the regressions reported in columns (A)-(E) in Table 6. See notes to Tables 5 and 6 for further details.

**Table A1: Pre-ADA Employment Discrimination Laws Protecting Disabled Workers –  
Categorization Incorporating Administrative “Reasonable Accommodations”  
Requirements – Control States**

	Statutory section	Traditional antidiscrimination prohibition– date adopted	“Reasonable accommodations” requirement– date adopted	Case law**
Arizona	41-1463(B)	1985	1985	
California	Govt. 12940(a), 12994	1980*	1981 <sup>+++++</sup>	√
Colorado	24-34-402(1)(a)	1979*	1979 <sup>*,++</sup>	√
Delaware	19:723(b), 724(a)	1988 <sup>†</sup>	1988 <sup>†</sup>	
Idaho	67-5909(1)	1988 <sup>†</sup>	1988 <sup>†</sup>	
Illinois	68:1-103(Q), 2-102(A)	1975*	1975 <sup>*,+++++</sup>	√
Iowa	610A.6(1)(a)	1965	1982 <sup>*,+++++</sup>	√
Louisiana	46:2254(A), (C)	1980	1980	√‡
Maine	5:4572(1)(A)	1973 <sup>++++</sup>	1985 <sup>*,+++++</sup>	√
Maryland	49B:16(a)	1974	1979 <sup>+++++</sup>	
Massachusetts	151B:4(16)	1983	1983	√‡
Minnesota	363.03:1(2), (6)	1979	1983 <sup>+++</sup>	√
Missouri	213.055.1(1)	1978*	1980 <sup>+++++</sup>	
Montana	49-2-203(a)	1983*	1983 <sup>*,+++++</sup>	
New Jersey	10:5-4.1, -29.1	1972	1986 <sup>*,+++++</sup>	
New Mexico	28-1-7(A), (J)	1978*	1983	
North Carolina	168A-4, 5	1985	1985	
Ohio	4112.02(A)	1980*	1985 <sup>*,+++++</sup>	√
Oregon	659.425(1)	1973	1979*	√
Pennsylvania	43:954(a), (b)	1974	1980 <sup>*,+++++</sup>	√
Rhode Island	28-5-7(1)	1987*	1987*	
South Dakota	20-13-10, 23.7	1986*	1986 <sup>++++</sup>	
Vermont	21:495(a)(1), 495d(6)	1981	1981	√
Virginia	51.5-41(A), (C)	1985*	1985*	√‡
Washington	49.60.180(1)	1973*	1978 <sup>*,+++++</sup>	√
West Virginia	5-11-9(a)(1)	1981*	1978 <sup>++++</sup>	√
Wisconsin	111.34(1)(b), 321, 322(1)	1973*	1981	√
Wyoming	27-9-105(a), (d)	1985*	1985*	

\* \*\* † †† ††† †††† ††††† ‡ See corresponding notes in Table Ia.

+++++ Amended: Maine–1975 (broadening coverage to mental as well as physical handicap.

+++++ Administrative interpretation: California–Admin. Code, tit. 2, §§ 7293.8, 7293.9; Illinois–56 Admin. Code § 2500.40; Iowa– Admin. Code 161:8.27(6)(c), 8.28; Maine–Human Rights Comm. Employment Reg. 3.08(D); Maryland–Admin. R. 14.03.02.05; Missouri–8 CSR 60-3.060 (originally codified at 4 CRS 180-3.060); Montana–Admin. R. 24.9.1404; New Jersey–Admin. Code 13:13-2.5(b); Ohio–Admin. Code 4112-5-08(E)(1); Pennsylvania–16 Code Reg. 44.14; West Virginia–Human Rights Comm. Reg. 4.02-4.03.



**Table A2: Pre-ADA Employment Discrimination Laws Protecting Disabled Workers –  
Categorization Incorporating Administrative “Reasonable Accommodations” Requirements –  
Group 2 Experimental States**

	Statutory section	Traditional antidiscrimination prohibition-- date adopted	“Reasonable accommodations” requirement-- date adopted	Case law
Alaska	18.80.220(a)(1)	1987 <sup>*</sup>	n/a	
Connecticut	46a-60(a)(1)	1973 <sup>†</sup>	n/a	√
Florida	760.10(1)	1977	n/a	√
Georgia	34-6A-4(a)	1981 <sup>†</sup>	n/a	√
Hawaii	378-2(1)	1986 <sup>*</sup>	n/a	
Indiana	22-9-1-2, 22-9-1-3(l)	1975	n/a	√
Kansas	44-1009(a)(1)	1974 <sup>*</sup>	n/a	√
Kentucky	207.150(1)	1976 <sup>†</sup>	n/a	√
Michigan	37.1102(2), 1202(1)	1976	n/a <sup>†††</sup>	√
Nebraska	48-1104	1977 <sup>*</sup>	n/a	√
Nevada	613.330(1)	1981 <sup>*</sup>	n/a <sup>††††</sup>	
New Hampshire	354-A:8(I)	1975	n/a	
New York	Exec. 296(1)(a)	1974	n/a	√
North Dakota	14-02.4-03	1983 <sup>*</sup>	n/a <sup>†††††</sup>	
Oklahoma	25:1302(A)	1981 <sup>*</sup>	n/a	
South Carolina	43-33-530	1983	n/a	
South Dakota	20-13-10, 23.7	1986 <sup>*</sup>	n/a <sup>†††</sup>	
Tennessee	8-50-103	1976 <sup>†</sup>	n/a	√
Texas	Civ. Art. 5221k, 5.01	1975 <sup>††</sup>	n/a <sup>††††††</sup>	√
Utah	34-35-6(1)(a)	1979 <sup>*</sup>	n/a	√ <sup>‡</sup>

\* , † See corresponding notes in Table 1a.

†† ††† †††† ††††† †††††† See corresponding notes in Table 1c.

‡ Amended: Connecticut—1978 and 1979 (broadening coverage to mental retardation and disorders as well as from physical disability); Georgia—1989 (technical amendment); Kentucky—1990; Tennessee—1986 and 1987.

**Table A3: Text of Definitions of “Disability” or “Handicap” Under Pre-ADA Employment Discrimination Laws Protecting Disabled Workers**

	Statutory section	Definition of disability/handicap
Alaska	18.80.300(12)	“‘Disability’ means (A) a physical or mental impairment that substantially limits one or more major life activities, (B) a history of, or a misclassification as having, a mental or physical impairment that substantially limits one or more major life activities, or (C) having (i) a physical or mental impairment that does not substantially limit a person's major life activities but that is treated by the person as constituting such a limitation; (ii) a physical or mental impairment that substantially limits a person's major life activities only as a result of the attitudes of others toward the impairment; or (iii) none of the impairments defined in this paragraph but being treated by others as having such an impairment.”
Arizona	41-1461(4)	“‘Handicap’ means a physical impairment that substantially restricts or limits an individual’s general ability to secure, retain or advance in employment.”
California	Govt. 12926	“‘Physical handicap’ includes impairment of sight, hearing, or speech, or impairment of physical ability because of amputation or loss of function or coordination, or any other health impairment which requires special education or related services.” “‘Medical condition’ means any health impairment related to or associated with a diagnoses of cancer.”
Colorado	24-34-301(4)(a)	“‘Handicap’ means a physical impairment which substantially limits one or more of a person’s major life activities and includes a record of such an impairment and being regarded as having such an impairment.”
Connecticut	1-1(g), 46a-51(13), (15)	“‘[M]ental retardation’ means a significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period.” “‘Physically disabled’ refers to any individual who has any chronic physical handicap, infirmity or impairment . . . , including, but not limited to, epilepsy, deafness, or hearing impairment or reliance on a wheelchair or other remedial appliance or device.”
Delaware	19:722(4)	“‘Handicapped person’ means any person who: a. Has a physical or mental impairment which substantially limits 1 or more major life activities; b. Has a record of such an impairment; or c. Is regarded as having such an impairment.”
Florida	Fenesy v. GTE Data Services, Inc., 3 Fla. Admin. L. Rep. 1764-A	“A person with a handicap does not enjoy, in some measure, the full and normal use of his sensory, mental, or physical faculties.”
Georgia	34-6A-2(30)	“‘Handicapped individual’ means any person who has a physical or mental impairment which substantially limits one or more of such person’s major life activities, and who has a record of such impairment.”
Hawaii	378-1	“‘Handicapped status’ means the state of having a physical or mental impairment which substantially limits one or more major life activities, having a record of such an impairment, or being regarded as having such an impairment.”
Idaho	67-5902(15)	“‘Handicap’ means a physical or mental condition of a person, whether congenital or acquired, which constitutes a substantial disability to that person and is demonstrable by medically accepted clinical or laboratory diagnostic techniques. A handicapped person is one who (a) has such a disability, or (b) has a record of such a disability, or (c) is regarded as having such a disability.”

**Table A3 (continued): Text of Definitions of “Disability” or “Handicap” Under Pre-ADA Employment Discrimination Laws Protecting Disabled Workers**

	Statutory section	Definition of disability/handicap
Illinois	68:1-103(I)(1)	“‘Handicap’ means a determinable physical or mental characteristic of a person . . . , the history of such characteristic, or the perception of such characteristic by the person complained against, which may result from disease, injury, congenital condition of birth or functional disorder.”
Indiana	22-9-1-3(q)	“‘Handicap’ means the physical or mental condition of a person that constitutes a substantial disability . . . unrelated to the person’s ability to engage in a particular occupation.”
Iowa	601A.2(4)	“‘Disability’ means the physical or mental condition of a person which constitutes a substantial handicap.”
Kansas	44-1002(j)	“‘Handicap’ means the physical condition of a person, whether congenital or acquired by accident, injury or disease which constitutes a substantial disability, but is unrelated to such person’s ability to engage in a particular job or occupation.”
Kentucky	207.130(2)	“‘Handicap’ means the physical condition of a person whether congenital or acquired, which constitutes a substantial disability to that person and is demonstrable by medically accepted clinical or laboratory diagnostic techniques.”
Louisiana	46:2253(1), (2)	“‘Handicapped person’ means any person who has an impairment which substantially limits one or more life activities or (a) has a record of such an impairment or (b) is regarded as having such an impairment.” “‘Impairment’ includes both ‘retardation’ and ‘prior mental disorder or condition’ as well as ‘physical or physiological disorder.’”
Maine	5:4553(7-A)	“‘Handicap’ means any disability, infirmity, malformation, disfigurement, congenital defect or mental condition caused by bodily injury, accident, disease, birth defect, environmental conditions or illness; and also includes the physical or mental condition of a person which constitutes a substantial handicap as determined by a physician or, in the case of mental handicap, by a psychiatrist or psychologist, as well as any other health or sensory impairment which requires special education, vocational rehabilitation or related services.”
Maryland	49B:15(g)	“‘Handicap’ means any physical disability, infirmity, malformation or disfigurement which is caused by bodily injury, birth defect or illness . . . ; and any mental impairment or deficiency as, but not limited to, retardation or such other which may have necessitated remedial or special education and related services.”
Massachusetts	151B:1(17)	“‘Handicap’ means (a) a physical or mental impairment which substantially limits one or more major life activities of a person; (b) a record of having such impairment; or (c) being regarded as having such impairment.”
Michigan	37.1103(b)	“‘Handicap’ means a determinable physical or mental characteristic of an individual or a history of the characteristic which may result from disease, injury, congenital condition of birth, or functional disorder which characteristic . . . is unrelated to the individual’s ability to perform the duties of a particular job or position, or is unrelated to the individual’s qualifications for employment or promotion.”
Minnesota	363.01(13)	“A disabled person is any person who (1) has a physical, sensory or mental impairment which materially limits one or more major life activities; (2) has a record of such an impairment; or (3) is regarded as having such an impairment.”

**Table A3 (continued): Text of Definitions of “Disability” or “Handicap” Under Pre-ADA Employment Discrimination Laws Protecting Disabled Workers**

	Statutory section	Definition of disability/handicap
Missouri	213.010(8)	“‘Handicap’, a physical or mental impairment which substantially limits one or more of a person’s major life activities, or a condition perceived as such, which with or without reasonable accommodation does not interfere with performing the job . . . in question.”
Montana	49-2-101(13), (16)	“‘Handicap’ means any mental disability resulting in subaverage intellectual functioning or impaired social competence[, or] a physical disability, infirmity, malformation, or disfigurement which is caused by bodily injury, birth defect, or illness.”
Nebraska	48-1102(8)	“‘Disability’ shall mean any physical or mental condition, infirmity, malformation, or disfigurement which is caused by bodily injury, birth defect, or illness . . . and shall also mean the physical or mental condition of a person which constitutes a substantial handicap, as determined by a physician, but does not reasonably preclude a person’s ability to engage in a particular occupation.”
Nevada	n/a	no definition (was added in 1991).
New Hampshire	354-A:3(XIII)	“‘Disability’ means disability, other than illness, unrelated to a person’s ability to perform a particular job or position available to him for hire or promotion so long as the individual will not present a hazard to himself or other employees.”
New Jersey	10:5-5(q)	“‘Handicapped’ means suffering from physical disability, infirmity, malformation or disfigurement which is caused by bodily injury, birth defect or illness . . . or from any mental, psychological or developmental disability resulting from anatomical, psychological, physiological or neurological conditions which prevents the normal exercise of any bodily or mental functions or is demonstrable, medically or psychologically, by accepted clinical or laboratory diagnostic techniques.”
New Mexico	28-1-2(M)	“‘[H]andicap’ means a physical or mental impairment that substantially limits one or more of an individual’s major life activities. An individual is also considered to be . . . handicapped if he has a record of a physical or mental handicap or is regarded as having a physical or mental handicap.”
New York	Exec. 292(21)	“‘Disability’ means (a) a physical mental or medical impairment resulting from anatomical, physiological or neurological conditions which prevents the exercise of a normal bodily function or is demonstrable by medically accepted clinical or laboratory diagnostic techniques or (b) a record of such an impairment or (c) a condition regarded by others as such an impairment, provided, however, that in all provisions of this article dealing with employment, the term shall be limited to disabilities which do not prevent the complainant from performing in a reasonable manner the activities involved in the job or occupation sought or held.”
North Carolina	168A-3	“‘Handicapped person’ means any person who (i) has a physical or mental impairment which substantially limits one or more major life activities; (ii) has a record of such an impairment; or (iii) is regarded as having such an impairment.”
North Dakota	14-02.4-02(7)	“‘Handicap’ means an impairment that substantially limits one or more major life activities. The term includes having a record of such an impairment or being regarded as having such an impairment.”

**Table A3 (continued): Text of Definitions of “Disability” or “Handicap” Under Pre-ADA  
Employment Discrimination Laws Protecting Disabled Workers**

	Statutory section	Definition of disability/handicap
Ohio	4112.01(A)(13)	“‘Handicap’ means a medically diagnosable, abnormal condition which is expected to continue for a considerable length of time, whether correctable or uncorrectable by good medical practice, which can reasonably be expected to limit the person’s functional ability. . . so that he cannot perform his everyday routine living and working without significantly increased hardship and vulnerability to what are considered the everyday obstacles and hazards encountered by the nonhandicapped.”
Oklahoma	25:1301(4)	“‘Handicapped person’ means a person who has a physical or mental impairment which substantially limits one or more of such person’s major life activities, has a record of such an impairment or is regarded as having such an impairment.”
Oregon	Admin. Reg. 839-06-205(7)	“‘Impairment’ means an apparent or medically detectable physical or mental condition which substantially limits one or more major life activities.”*
Pennsylvania	16 Adm. Code 44.4	“‘Handicapped or disabled person’ [means] A person who: (A) has a physical or mental impairment which substantially limits one or more major life activities; (B) has a record of such an impairment; or (C) is regarded as having such an impairment.”
Rhode Island	28-5-6(7)	“‘[H]andicap’ means any physical or mental impairment which substantially limits one or more major life activities, a record of such an impairment or is regarded as having such an impairment” [sic].
South Carolina	43-33-560	“‘Handicap’ [means] a substantial physical or mental impairment, whether congenital or acquired by accident, injury, or disease, where the impairment is verified by medical findings and appears reasonably certain to continue throughout the lifetime of the individual without substantial improvement, but . . . which is unrelated to the individual’s ability to engage in a particular job or occupation. This does not include any individual who is . . . only regarded as being handicapped. The term ‘mental impairment’ shall not include mental illness.”
South Dakota	20-13-1(4)	“‘Disability,’ any determinable physical or mental characteristic of an individual or a history of the characteristic which may result from disease, injury, congenital condition of birth or functional disorder which . . . is unrelated to an individual’s ability to perform the duties of a particular job or position, or is unrelated to an individual’s qualifications for employment or promotion.”
Tennessee	n/a	no definition.
Texas	Civ. Art. 5221k, 2.01(4)	“‘Disability’ means a mental or physical impairment that substantially limits at least one major life activity or a record of such a mental or physical impairment.”
Utah	34-35-2(9)	“‘Handicap’ means a physical or mental impairment which substantially limits one or more of a person’s major life activities.”
Vermont	21-495d(5)	“‘Handicapped individual’ means any person who (A) has a physical or mental impairment which substantially limits one or more major life activities; (B) has a history or record of such an impairment; or (C) is regarded as having such an impairment.”

\* The statutory requirement in Table 1 prohibits discrimination because an individual has an impairment, has a record of an impairment, or is regarded as having an impairment.

**Table A3 (continued): Text of Definitions of “Disability” or “Handicap” Under Pre-ADA  
Employment Discrimination Laws Protecting Disabled Workers**

	Statutory section	Definition of disability/handicap
Virginia	51.5-3	“Person with a disability’ means any person who has a physical or mental impairment which substantially limits one or more of his major life activities or has a record of such impairment and which . . . is unrelated to the individual's ability to perform the duties of a particular job or position, or is unrelated to the individual's qualifications for employment or promotion.”
Washington	Admin. Code. 162-22-030	“Handicaps’ are . . . physical, mental, or sensory impairments that would impede that individual in obtaining and maintaining permanent employment and promotional opportunities.”
West Virginia	5-11-3(t)	“Handicap’ means a person who: (1) Has a mental or physical impairment which substantially limits one or more of such person’s major life activities . . . ; (2) Has a record of such impairment; or (3) Is regarded as having such an impairment.”
Wisconsin	111.32(8)	“Handicapped individual’ means an individual who: (a) Has a physical or mental impairment which makes achievement unusually difficult or limits the capacity to work; (b) Has a record of such an impairment; or (c) Is perceived as having such an impairment.”
Wyoming	Fair Employment Commission Concerning Handicap Discrimination Complaints Filed Pursuant to the Fair Employment Practices Act of 1965 as Amended, Ch. X, § 3	“Handicapped person’ means any person who has a physical or mental impairment which substantially limits one or more major life activities, has a record of such impairment, or is regarded as having such an impairment.”

**Table A4: Difference-in-Difference-in-Difference Analysis for Three State Groups – Categorization Incorporating Administrative “Reasonable Accommodations” Requirements (Tables A1, 1b, and A2)**

<b>MEAN EMPLOYMENT LEVELS – Group 1 Experimental States versus Control States</b>							
Location	Before ADA	After ADA	Time Diff. for Location	Location	Before ADA	After ADA	Time Diff. for Location
<b>Disabled individuals</b>				<b>Nondisabled individuals</b>			
<i>Group 1 Experimental States</i>	12.671	11.112	-1.559	<i>Group 1 Experimental States</i>	39.250	40.344	1.094
	0.97	0.89	1.32		0.29	0.28	0.40
<i>Control States</i>	16.955	16.054	-0.901	<i>Control States</i>	40.716	40.749	0.032
	0.36	0.33	0.49		0.08	0.08	0.11
<b>Location Difference</b> (point in time)	-4.284	-4.942		<b>Location Difference</b> (point in time)	-1.466	-0.404	
	1.03	0.95			0.30	0.29	
<b>Difference-in-difference:</b>		-0.658		<b>Difference-in-difference:</b>		1.062	
		1.40				0.42	
<b>Difference-in-difference-in-difference:</b>		-1.720					
		1.46					

<b>MEAN EMPLOYMENT LEVELS – Group 2 Experimental States versus Control States</b>							
Location	Before ADA	After ADA	Time Diff. for Location	Location	Before ADA	After ADA	Time Diff. for Location
<b>Disabled individuals</b>				<b>Nondisabled individuals</b>			
<i>Group 2 Experimental States</i>	15.493	14.265	-1.228	<i>Group 2 Experimental States</i>	40.338	40.440	0.102
	0.40	0.37	0.55		0.09	0.10	0.13
<i>Control States</i>	16.955	16.054	-0.901	<i>Control States</i>	40.716	40.749	0.032
	0.36	0.33	0.49		0.08	0.08	0.11
<b>Location Difference</b> (point in time)	-1.462	-1.789		<b>Location Difference</b> (point in time)	-0.378	-0.309	
	0.54	0.50			0.12	0.12	
<b>Difference-in-difference:</b>		-0.327		<b>Difference-in-difference:</b>		0.070	
		0.73				0.17	
<b>Difference-in-difference-in-difference:</b>		-0.397					
		0.75					

<b>MEAN EMPLOYMENT LEVELS -- Group 1 Experimental States versus Group 2 Experimental States</b>							
Location	Before ADA	After ADA	Time Diff. for Location	Location	Before ADA	After ADA	Time Diff. for Location
<b>Disabled individuals</b>				<b>Nondisabled individuals</b>			
<i>Group 1 Experimental States</i>	12.671	11.112	-1.559	<i>Group 1 Experimental States</i>	39.250	40.344	1.094
	0.97	0.89	1.32		0.29	0.28	0.40
<i>Group 2 Experimental States</i>	15.493	14.265	-1.228	<i>Group 2 Experimental States</i>	40.338	40.440	0.102
	0.40	0.37	0.55		0.09	0.10	0.13
<b>Location Difference</b> (point in time)	-2.823	-3.153		<b>Location Difference</b> (point in time)	-1.088	-0.095	
	1.05	0.96			0.30	0.30	
<b>Difference-in-difference:</b>		-0.331		<b>Difference-in-difference:</b>		0.992	
		1.42				0.43	
<b>Difference-in-difference-in-difference:</b>		-1.323					
		1.49					

Notes: See Table 4 Notes.

**Table A5 – Regression Results – Wage as the Dependent Variable  
(Men and Women – Ages 21 - 58)**

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
<b>ADA</b>	0.136 0.01	0.145 0.01	0.140 0.01	0.143 0.01	0.136 0.01	0.143 0.01	0.171 0.01	0.103 0.01	0.129 0.01	0.044 0.01	0.035 0.00
<b>DIS</b>	-0.421 0.02	-0.446 0.04	-0.436 0.03	-0.469 0.03	-0.422 0.02	-0.400 0.05	-0.446 0.04	-0.385 0.05	-0.386 0.05	-0.372 0.04	-0.428 0.03
<b>ADA * GR1</b>		0.030 0.02	0.036 0.02	0.032 0.01	0.039 0.01	0.037 0.01	0.052 0.02	0.024 0.02	0.045 0.02	0.013 0.01	
<b>ADA * GR2</b>		-0.014 0.01	-0.007 0.01	-0.013 0.01	-0.005 0.01	-0.005 0.02	-0.013 0.02	-0.016 0.02	-0.015 0.02	-0.013 0.01	
<b>ADA * DIS</b>	-0.020 0.04	-0.021 0.06	-0.050 0.06	0.024 0.06	-0.008 0.05	0.020 0.08	-0.016 0.06	-0.080 0.06	-0.076 0.06	-0.094 0.07	-0.013 0.03
<b>ADA*GR1*DIS</b>		-0.029 0.20	0.000 0.20	-0.074 0.20	-0.042 0.20	-0.069 0.22	-0.039 0.11	0.066 0.18	0.055 0.09	0.159 0.19	
<b>ADA*GR2*DIS</b>		0.003 0.08	0.043 0.08	-0.063 0.08	-0.027 0.08	-0.159 0.15	0.031 0.08	0.100 0.08	0.129 0.08	0.105 0.07	
$\beta_{11}-\beta_{12}$		-0.032 0.20	-0.044 0.20	-0.011 0.20	-0.015 0.20	0.090 0.23	-0.070 0.09	-0.034 0.18	-0.074 0.08	0.054 0.18	
<b>Obs.</b>	224,410	224,410	224,410	224,410	224,410	37,516	222,500	225,699	223,789	229,537	229,537

Notes: All regressions are weighted using CPS survey weights. Robust standard errors are reported immediately under each estimate. Dependent variable is log wages. Estimate of  $\beta_{11} - \beta_{12}$  is based on estimated coefficients of  $\beta_{11}$  and  $\beta_{12}$  given in the two preceding rows.

Column (A) presents estimates of an OLS regression run on a sample of all 50 states for years 1987/1988 (before years) and 1992/1993 (after years).

Column (B) presents estimates of equation (1) from the text for years 1987/1988 (before years) and 1992/1993 (after years) using the categorization of states reflected in Tables 1a-1c.

Column (C) presents the same specification as in column (B) except that Michigan and South Dakota are categorized as control states (those with both "reasonable accommodations" requirements and traditional antidiscrimination prohibitions pre-ADA). See notes to Table 1c.

Column (D) presents the same specification as in column (B) except that Texas is categorized as a control state. See notes to Table 1c.

Column (E) presents the same specification as in column (B) except that the categorization of states from Tables A1, 1b, and A2 is used.

Column (F) runs the specification of column (B) on Southern states only.

Columns (G), (H), (I) and (J) present the same specification as in column (B) but using different ranges of data: 1987/1988 & 1993/1994 (column (G)); 1988/1989 & 1992/1993 (column (H)); 1988/1989 & 1993/1994 (column (I)); 1990/1991 & 1992/1993 (column (J)).

Column (K) presents the specification of column (A) using the before-after dates of column (J).