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Measuring the Effects of Employment Protection Policies for the Disabled: Theory and Evidence from the Americans with Disabilities Act

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Abstract

We evaluate the Americans with Disabilities Act (ADA) using a directed search model in which firms post health-contingent wage contracts. We theoretically show that the ADA benefits disabled workers at the expense of non-disabled workers if firms face a high penalty for preferentially hiring non-disabled, whereas the disabled are worse off if the expected cost from terminating a disabled employee is high. Our estimation results imply that disabled job-finding and job-separation rates decreased, suggesting that for firms, the cost of hiring discrimination is lower than disabled-worker termination. Overall, the ADA caused a 2.2 percentage point decline in disabled employment rates.

JEL Codes: J78, J64, J68, K31
Keywords: Americans with Disabilities Act, employment protection, search friction, wage posting, job-finding rate

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1 Introduction

The Americans with Disabilities Act (ADA) of 1990 is a civil rights law intended to protect people with disabilities from discrimination. Title I of the ADA covers employment protection, which prohibits employers from discriminating against workers based on disability, and requires them to provide reasonable accommodations to qualified employees. After the ADA was enacted, it became possible for employees who felt discriminated to file charges against their employers, protecting workers with disabilities, but simultaneously placing constraints on (potential) employers with disabled employees. In 2015, the total number of charges filed under the ADA accounted for 30% of all filings under the Equal Employment Opportunity Commission, and $\$128.7$ million in monetary benefits were issued. With the passage of the ADA's Amendments in 2008[1] and the aging of the American population, increasingly more individuals are expected to benefit from the law, imposing higher costs on firms with (and those planning on hiring) disabled employees.

Despite the rapid expansion of eligibility under the law, there is little understanding of the mechanisms through which the key clauses of the ADA–no discrimination in firing, hiring, or wages, and providing reasonable accommodations–affect firms' behavior and thereby the labor market outcomes of workers. In order to fill this gap in the literature, we first analytically show how the optimal behavior of firms and equilibrium labor market outcomes of workers of different health statuses are affected by the cost parameters associated with each clause in the ADA. Then, we empirically estimate the causal impact of the ADA on worker flows. By mapping the theoretical predictions to the estimated changes in the transition rates of workers, we are able to infer the relative size of the policy parameters and the

[1] In 2008, the ADA Amendments Act (ADAAA) was passed to broaden and clarify the definition of disabilities. Under the ADAAA, a person is considered disabled if he/she (i) has a physical or mental impairment that substantially limits one or more major life activities, (ii) has a history or record of such an impairment, or (iii) is perceived by others as having such an impairment.

trade-offs that firms face under the ADA.

For the theoretical analysis, we first develop a general equilibrium model with search frictional labor markets to capture the response of both firms and workers in a unified framework. We model heterogeneous workers who differ in health statuses that affect their net productivity at a job.[2] In the competitive equilibrium of our directed search model where firms post health-dependent wage contracts, unhealthy (less productive) workers receive lower wages and face lower job-finding rates than their healthier counterparts. Then, we incorporate into our model, the four major clauses in Title I of the ADA: no discrimination in firing, no discrimination in hiring, no discrimination in wages, and providing reasonable accommodations for their disabled employees. We use the model to analyze equilibrium outcomes and derive conditions under which the policy could help (or deter) the integration of disabled individuals in the labor market.

The most interesting finding of our theoretical analysis is that there are potentially two different types of equilibrium that arise under the ADA. In effect, the firing and accommodations clauses of the ADA increase the cost of employing a disabled worker (lowering their net productivity), providing greater incentive for firms to discriminate at the hiring stage. On the other hand, the introduction of hiring costs reduces jobs for the non-disabled. We prove that if the cost that firms face from discriminating at the hiring stage is relatively high, firms find it optimal to fully abide by the law by treating all workers equally through cross-subsidization in wages, improving the welfare of the disabled compared to competitive equilibrium. Otherwise, firms post fewer vacancies per disabled worker in order to avoid the costs that arise from firing and accommodations, worsening the labor market outcome of the disabled.

[2]We are agnostic about the source of discrepancy in the net productivity. It might be driven by the pure productivity effects of health, or higher costs necessary to accommodate unhealthy workers.

Guided by our theory, we empirically estimate the impact of the law on workers' performances in terms of the transition rates between employment and non-employment using the cross-state variation in pre-ADA employment protection regulations.[3] We find that in states with weaker pre-existing labor protection laws, the introduction of the ADA reduced the annual employment-to-employment transition probability of the disabled by 5.8 percentage points (from 39.5% to 33.7%). Moreover, the annual transition rate from non-employment to non-employment increased by 1.3 percentage points (from 88.1% to 89.4%), jointly contributing to a 2.2-percentage-point decrease in the employment level for disabled workers. During the same time period, however, we do not observe a decline in the employment-to-employment transition rate of the non-disabled workers. Within our theoretical analysis, these empirical findings suggest that firms seem to be facing relatively higher costs from firing the disabled than from providing accommodations. Furthermore, firms face low costs for discriminating against the disabled in the hiring stage. As a consequence, the ADA exacerbated the underperformance of disabled workers in the labor market by providing fewer incentives for firms to hire the disabled, rather than inducing cross-subsidization across workers as the government intended.

Previous literature assessing the impact of the ADA has adopted frictionless labor market models and has measured labor market outcomes using stock variables such as the employment rate and the labor force participation rate (Acemoglu and Angrist, 2001 and DeLeire, 2000, among others). The benefit of using a frictional labor market is that from our empirical analysis on transition rates, we are able

[3] Prior to 1990, 39 states had already implemented labor protection laws for the disabled similar to the ADA. Therefore, the ADA did not introduce significant additional costs to firms in these states. We treat these states with pre-existing labor protection laws as a control group, and compare them with the experiences of the disabled in the 11 other states with weaker labor protection prior to the ADA.

to identify which clause of the law is costliest for firms to violate. Our analysis, therefore, sheds light on not only evaluating the impact of the ADA in its current form, but also allows us to understand which clause is a crucial determinant of the successful implementation of the law leading to welfare improvement for disabled workers.

Related Literature There is a growing macroeconomics literature studying the impact of health policies for disabled workers (e.g., Low and Pistaferri, 2015; Michaud and Wiczer, 2014; Kitao, 2014).[4] Our paper fits in this broad literature and we focus on evaluating the impact of the ADA.

Our paper is related in a theoretical sense to the previous literature on the competitive search equilibrium with heterogeneous agents. Based on Moen (1997) and Menzio and Shi (2010, 2011), we incorporate the employment protection policies in a directed search model and study the general equilibrium implications of the regulation. In this regard, our paper is similar to Acemoglu and Shimer (1999), which studied unemployment insurance policies in a directed search environment.

We characterize our equilibrium closely following Guerrieri, Shimer and Wright (2010), who proposed the definition of competitive search equilibrium in an environment with asymmetric information. Similar to the analysis of those authors, in our model the matching probabilities as well as the distribution of types of off-the-equilibrium submarkets are constructed to be consistent with optimality conditions of agents. However, unlike the unique separating equilibrium in their analysis, our model has two potential types of equilibrium: a standard separating equilibrium and a pooling equilibrium. The difference comes from the fact that our environment allows firms to post type-specific wages in a complete information setting.

Our paper is also related to the literature of discrimination in labor markets.

[4]These papers focus on the role of disability insurance (the most commonly discussed policy for disabled workers) in providing insurance against disability risks for workers.

Lang, Manove and Dickens (2005) and Shi (2006) studied the discrimination in frictional labor markets. Lang, Manove and Dickens (2005) found that workers facing discrimination apply to jobs with lower wages, and that labor markets are segregated in equilibrium when firms can discriminate at the hiring stage. Shi (2006) generalized the contract environment where firms can discriminate against workers in both hiring rate and wage compensation. In contrast, our paper addresses the firms' hiring decisions in a simplified environment where a match is both bilateral and always formed once a firm and a worker meet. We instead focus on modeling the firms' options, taking into account the main features of the ADA.

While many have acknowledged (without a theoretical model) the interactive impact of firms and workers under the ADA, our paper is the first to study the impact of the ADA in a general equilibrium model with search frictions. By adopting the directed search framework, we can infer the effects of each clause of the ADA from the changes in labor market flows of workers.

Lastly, this paper is also related to empirical research on the ADA. Most empirical studies (Acemoglu and Angrist, 2001; DeLeire, 2000) find a lower employment rate for disabled workers after the ADA,[5] and we complement the literature by focusing on flow variables and decomposing the employment effect of the law. Our main identification strategy complements and extends that of Jolls (2004) and Jolls and Prescott (2004) by incorporating the institutional details documented in Percy (1989) to generate a more comprehensive measure of state-level employment protection policies.[6]

[5] Kruse and Schur (2003) finds a positive employment effect for workers with functional and activity limitations (but not among workers with work disabilities, which is a more common definition used in the literature). Burkhauser, Butler and Kim (1995) and Burkhauser et al. (1999) focus on the effects of accommodations on the job duration and disability insurance application timing of workers.

[6] A recent paper by Neumark, Song and Button (2015) studies the effects of employment protection on hiring of older workers using state-level variations in disability discrimination laws, and finds a non-significant role of policies. Unlike our paper, however, their sample period is post-ADA

The remainder of the paper is organized as follows. In the next section, we document stylized facts summarizing labor market performance of workers by health status. Then we introduce our model and characterize the effects of the Americans with Disabilities Act in Section 3. Section 4 contains descriptions of our empirical analysis and its results. Section 5 concludes.

2 Disability and Labor Market Outcomes

In this section, we document stylized facts on the aggregate trends in disability and compare the labor market transition rates of disabled workers to their healthier counterparts in the United States. The main source of our analysis is the matched Annual Social and Economic Supplement from the Current Population Survey (March CPS) for the years 1981 through 2001.[7] Unlike other micro-level panel datasets, the matched March CPS has a large number of observations spanning over twenty years that allows us to explore the linkage between the health status and labor market outcomes of individuals.[8]

2.1 Aggregate Trends in Disability

Starting in 1981, the March CPS began collecting information on whether individuals have any form of health problems causing work limitations. We use the

(from 1992 to 2002), comparing stronger protection states to other states with federal standards set by the ADA.

[7]While the data is available until 2015, we deliberately choose to conduct our analysis on years up until 2001, as there were recessions in 2001 and 2008. During recessions, disabled workers are affected more than the non-disabled (Bound and Burkhauser, 1999). Therefore, including the recession years can bias our empirical results (in this section as well as in Section 4). However, it should be noted that even when we conduct our analyses including post-2001 data, the overall trends of the disabled workers' labor market outcomes still remain the same.

[8]Even though the CPS is not a panel dataset, we can track individuals at an annual frequency by using consistency of demographic information of the resident within the housing unit–sex, age, and educational attainment (Madrian and Lefgren (2000)). Since we track individuals annually, we focus on out-of-the-labor-force instead of unemployment spells to minimize the time aggregation bias (Shimer, 2012).

respondents' answers to the question "*Does the respondent have a health problem or a disability which prevents work or which limits the kind or amount of work?*" to classify whether the individual is disabled or not.[9] Another health-related variable of interest to us is : "*Did the respondent retire or leave a job for health reasons?*" This question directly asks recent dropouts from the labor force whether the main factor that caused them to quit or retire from their job was their poor health status. Unlike the first question, this one is driven by both the long-run population health trends and the behavioral response of workers, affected by economic conditions. Therefore, the difference between the two variables could be an indicator of behavioral changes in workers with poor health statuses in the labor market.

FIGURE 1
SHARE OF THE WORKING-AGE POPULATION WITH WORK LIMITATIONS

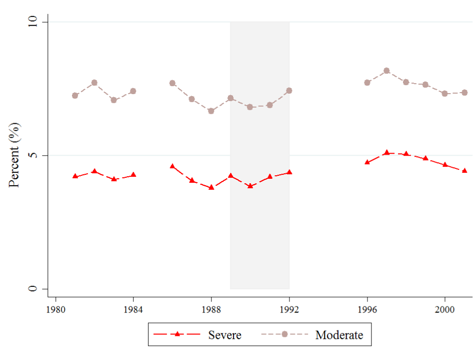


FIGURE 2
SHARE OF INDIVIDUALS LEAVING THE WORKFORCE DUE TO POOR HEALTH

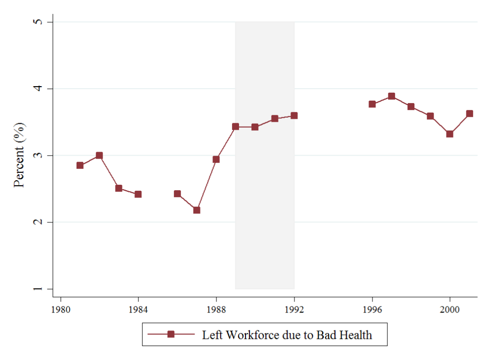


Figure 1 shows the aggregate time trend of the share of population between the ages of 21 and 60 (the working-age population) who reported having work limitations.[10] The dashed line circles is the fraction reporting a work-related limitation in one year ("Moderate" in Figure 1), and the red dashed line with triangles indicates

[9] Despite its narrow definition of disabilities and the shortcomings of self-reporting, Burkhauser and Houtenville (2006) found that the overall trend of disability rate in the March CPS is similar to other measures of disabilities found from the National Heath Interview Survey (NHIS).

[10] In 1994 and 1995, CPS suppressed the linking keys, making it impossible to link data in those two years.

the share who reported work limitations for two consecutive years ("Severe" in Figure 1). Regardless of the measure, we observe that the fraction of the working-age population with work limitations remained relatively stable during these time periods.

We also plot the share of individuals leaving the labor force for a health-related reason in Figure 2. The fraction of individuals leaving the labor market for a health-related reason steadily grew from 3% in the 1980s to 4% in the 1990s. One important feature that stands out in the trend line is that the fraction of individuals citing health as the main reason for leaving their job increased by 1 percentage point (33%) in the early 1990s, even though the ADA was intended to make it easier for employees to keep their jobs when they experience physical or mental disabilities.[11]

2.2 Labor Market Performances by Health Statuses

In this section, we compare the effects of work limitation on the labor market transition probabilities of workers.[12] We document the following facts: (i) disabled workers are less likely to remain employed and more likely to stay out of the labor force; and (ii) the discrepancy in the labor market transitions across disabled and non-disabled workers has increased since the 1990s.

Labor Market Transitions Our goal is to analyze the effects of disability on a worker's labor market transitions between Employment (E) and Non-Employment (N) in annual frequency after controlling for observable individual characteristics. An individual is classified as Non-Employed if he is currently unemployed and actively searching for a job, or if he is out of the labor force. We restrict our empirical analysis to individuals who maintain the same health status level for two consecutive years. Our baseline probit model is specified as:

[11] Controlling for the demographic change does not affect the significance of the results. More details can be found in Appendix A.1.

[12] The effects of disability on employment rates are documented in Appendix A.2.

$$\mathbf{Pr}\left(l_{t+1}=j\right) \quad = \quad \Phi\left(y_t+\alpha_s+\beta_s t+\gamma \mathbb{I}_{\{\text{disabled}\}}+X_i\beta+\epsilon_i \middle| \, l_t=i\right), \quad (1)$$

where the dependent variable is the probability that an individual changes his labor market status (l_t) from $i \in \{E, N\}$ to $j \in \{E, N\}$. The control variables are year dummies (y_t), state dummies (α_s), and state-specific time trends (β_s) which capture the state-specific macroeconomic conditions and trends. We also control for individual characteristics (X_i) using gender, race, marital status, years of education, and age (polynomial). We allow robust standard errors for ϵ_i and cluster them by states. Table 1 summarizes the estimation results: Part A reports the coefficient on disability,[13] and part B reports the predicted probabilities of labor market transitions by health status based on the estimated coefficients, assuming all other characteristics are the same at the mean of the sample. For each probit regression, we find that disability has a significantly negative impact on an individual's labor market transition probabilities. Individuals with disabilities experience a 21 percentage point (22%) lower job-continuation rate compared to their healthier counterparts. They are also 23 percentage point (32%) more likely to remain jobless in annual frequency.

TABLE 1
EFFECTS OF DISABILITY ON LABOR MARKET TRANSITIONS

	E-to-E	N-to-N
A. Coefficient		
Disability	-0.902^{***}	1.220^{***}
	$[-0.96, -0.84]$	$[1.17, 1.27]$
B. Predicted Probabilities (%)		
Non-Disabled	93.2	72.5
	$[93, 93]$	$[72, 73]$
Disabled	72.3	95.6
	$[70, 74]$	$[95, 96]$

Note: Table 1 shows the probit regression coefficients and the predicted probabilities of labor market transitions based on equation (1). Probabilities are computed at the mean of independent variables and given as percentages. Numbers in brackets are at a 95% confidence interval based on robust standard errors clusted by states. $^{***}p < 1\%$.

[13] We report the full estimation results in Table 7 in Appendix D.

Trends in Labor Market Transition Probabilities Lastly, we compare the effects of the disability status before and after the ADA by replacing the year dummies with a new set of disability dummy variables indicating the introduction of the ADA ($t \geq 1990$)[14]:

$$\begin{aligned} &\mathbf{Pr}\left(l_{t+1} = j\right) \qquad (2) \\ &= \Phi\left(\alpha_s + \beta_s t + \gamma_1 \mathbb{I}_{\{\text{disabled}\}} + \gamma_2 \mathbb{I}_{\{\text{disabled}\}} \mathbb{I}_{\{t \geq 1990\}} + X_i \beta + \epsilon_i \middle| \, l_t = i\right). \end{aligned}$$

The results presented in Table 2 suggest that job-continuation and job-finding perspectives of the disabled worsened after 1990. For those who were already employed, we see that poor health status is associated with relatively lower job-continuation rates in the 1990s ($\gamma_{2,EE} < 0$). The decrease in the employment-to-employment transition rate is 2.3 percentage points for an average individual with disabilities. Moreover, the estimated coefficient on disability for the transition rate from non-employment to non-employment increased significantly in 1990s compared to 1980s ($\gamma_{2,NN} > 0$), resulting in a job-finding rate that is 0.7 percentage points lower.

TABLE 2
TRENDS IN TRANSITION PROBABILITY

	E-to-E		N-to-N	
A. Coefficient				
	$\gamma_{1,EE}$	$\gamma_{2,EE}$	$\gamma_{1,NN}$	$\gamma_{2,NN}$
Disability	-0.900^{***}	-0.070^{***}	1.226^{***}	0.078^{***}
	$[-0.96, -0.84]$	$[-0.11, -0.03]$	$[1.17, 1.28]$	$[0.030, 0.13]$
B. Predicted Probabilities (%)				
	Pre-ADA	Post-ADA	Pre-ADA	Post-ADA
Non-Disabled	93.7	92.8	71.1	73.5
	$[93, 94]$	$[93, 93]$	$[70, 72]$	$[73, 74]$
Disabled	73.7	71.4	95.1	95.8
	$[72, 76]$	$[69, 73]$	$[95, 96]$	$[95, 96]$

Note: Table 2 documents the probit regression coefficients and predicted probabilities of labor market transitions from estimation equation (2). Probabilities are computed at the mean of independent variables and given as percentages. Numbers in brackets are at a 95% confidence interval based on robust standard errors clustered by states. $^{***}p < 1\%$.

[14] Other independent variables remain the same as in equation (1).

While we find that the labor market performances of disabled workers have worsened since the 1990s, we cannot conclude that these changes were solely due to the ADA. The time periods in which ADA was enacted coincided with recession periods, and it is well known that the disabled tend to have higher volatility in labor statistics (Bound and Burkhauser, 1999). Moreover, during the same time period, there was a steady increase in the share of workers receiving Disability Insurance (Autor, 2015). While we can partially control for cyclicality using longer time series data, it is more difficult to control for the expansion of Disability Insurance, which is empirically found to distort the labor supply decisions of disabled workers (e.g., French and Song (2014) and Maestas, Mullen and Strand (2013), among others). These are some of the key confounding factors in identifying the effects of the ADA if we were to simply compare the aggregate labor market statistics pre- and post-ADA. Thus, in Section 4, we exploit the cross-state variations in employment protection policies to evaluate how the ADA has influenced disabled and non-disabled workers in the labor market. Before the empirical analysis, however, we first aim to analyze the potential impact of the ADA theoretically in the next section.

3 The Model

In this section, we build a general equilibrium model of the labor market and provide a framework to analyze the effects of the federal employment protection policy.

3.1 Environments

Time is discrete and continues forever. The economy is populated by a unit measure of workers. Each worker is endowed with one indivisible unit of labor. Workers are heterogeneous in their health statuses, and we denote their health types as $i \in \mathcal{I} \equiv \{1, 2, ...N\}$, where high types ($i$) denote higher health status (healthier).

The worker's health status is observable and determines the efficiency of his labor endowment. The measure of type-i workers is denoted by π_i, with $\sum_{i\in\mathcal{I}}\pi_i = 1$. Workers discount the future at rate $\beta \in (0,1)$ and have a period utility function represented by $\nu(x) - \phi e$, where $\nu : \mathbb{R}_+ \to \mathbb{R}$ is the utility from consumption (x) and ϕe is the disutility of exerting search effort while unemployed. The utility function ν is twice differentiable, $\nu' > 0$ and $\nu'' \leq 0$. The effort e is either 0 or 1, and the cost of job-search ϕ is strictly positive. Workers who do not exert any search effort ($e = 0$) remain jobless in the following period with certainty. We denote the value of home production by b.

The economy is also populated by a positive measure of continuum of firms. Firms have linear utility and discount the future at rate β. They have access to a constant-returns-to-scale production technology that translates type-i employees into y_i units of final goods. In particular, the net output of healthy workers is higher so that $y_i < y_{i+1}, \forall i < N-1$.[15] The discrepancy in the net productivity of workers across health statuses can stem from either the pure productivity effects of health, or from higher costs that are necessary for unhealthy workers to produce the same output as healthy workers. For example, it might also be that both kinds of workers have the same productivity, but the disabled require costly equipment or accommodations to perform their tasks, lowering their net productivity.

In the beginning of a period, a $\delta \in (0,1)$ fraction of matches dissolves exogenously. Then, workers and firms meet and produce output in frictional labor markets through a directed search process.[16] We assume that the labor market is organized in a continuum of submarkets that differ in wage contracts $\boldsymbol{w} \equiv \{w_i\}_{i\in\mathcal{I}}$, where w_i denotes the amount the firm pays to the type-i worker each period until the match

[15] As we assume a one-on-one relationship between health status and net output, we use unhealthy (healthy), disabled (non-disabled), and less (more) productive interchangeably throughout the paper.

[16] See, e.g., Moen, 1997; Acemoglu and Shimer, 2000 and Menzio and Shi, 2011.

ends. Firms decide whether to create a vacancy (v) and at which wage contract $\boldsymbol{w}$. The cost of posting a vacancy is $\kappa > 0$. Simultaneously, workers without jobs decide whether to exert search effort ($e = 1$) or remain out of the labor force ($e = 0$), and which submarket indexed by $\boldsymbol{w}$ to apply to if $e = 1$. For each submarket with wage contract $\boldsymbol{w}$, we denote the market tightness or the vacancy-to-unemployment ratio as $\theta(\boldsymbol{w}) \equiv v(\boldsymbol{w})/u(\boldsymbol{w})$, where $v(\boldsymbol{w})$ represents the total number of vacancies posted in submarket $\boldsymbol{w}$ and $u = \sum_{i \in \mathcal{I}} u_i(\boldsymbol{w})$ represents the total number unemployed workers seeking jobs in submarket $\boldsymbol{w}$. For each submarket, both firms and workers take the market tightness $\theta(\boldsymbol{w})$ as given when they make their search decisions.

In the following stage, within a submarket $\boldsymbol{w}$, a worker seeking a job matches with a firm. We assume that the matches are bilateral and formed by a constant-returns-to-scale matching function $m(u, v)$. Thus, the probability of filling a vacancy in a submarket is represented by $q(\theta(\boldsymbol{w})) \equiv m(u, v)/v = m\left(\theta(\boldsymbol{w})^{-1}, 1\right)$ and the job-finding rate of a worker by $p(\theta(\boldsymbol{w})) \equiv m(u,v)/u = \theta(\boldsymbol{w})\, q(\theta(\boldsymbol{w}))$. We assume $\lim_{\theta(\boldsymbol{w})\to\infty} q(\theta(\boldsymbol{w})) = 0$ and $\lim_{\theta(\boldsymbol{w})\to 0} q(\theta(\boldsymbol{w})) = 1$. Similarly, job-finding rates for the unemployed satisfy the boundary conditions: $\lim_{\theta(\boldsymbol{w})\to\infty} p(\theta(\boldsymbol{w})) = 1$ and $\lim_{\theta(\boldsymbol{w})\to 0} p(\theta(\boldsymbol{w})) = 0$.

3.2 A Competitive Equilibrium without Employment Protection

Given the environment described in the previous section, we solve for the competitive equilibrium without government intervention. We present the problem of workers and firms, and characterize the properties of the competitive equilibrium in the absence of policy.

3.2.1 Problems of the Worker and the Firm

We start by describing the decision problem of an employed worker. Equation (3) presents the value of an employed worker of type-i with wage w:

$$W_i(w) = \nu(w) + \beta\left[(1-\delta) W_i(w) + \delta \max\{U_i, N_i\}\right]. \tag{3}$$

The employed type-i worker enjoys a flow utility of $\nu(w)$ until the match is dissolved, which happens at rate δ. When the match is destructed, the worker can either choose to be unemployed and search for a job or exit the labor force, values given by U_i and N_i, respectively. A non-employed worker makes a labor market participation decision by comparing the value of being unemployed U_i and the value of being out of the labor force N_i.

Unemployed workers enjoy leisure that yields current utility $\nu(b)$, and pay a flow utility cost of ϕ from searching. Since the job search is directed, each unemployed worker chooses a submarket $\boldsymbol{w}$ in which to search for a job, which maximizes his expected utility. Workers face a submarket-specific job-finding probability, $p(\theta(\boldsymbol{w}))$. If the worker does not find a job, he can make the labor market participation decision again. Thus, the value function of an unemployed worker can be written as:

$$U_i = \nu(b) - \phi + \beta\left[\max_{\boldsymbol{w}} p(\theta(\boldsymbol{w})) W_i(w_i) + (1 - p(\theta(\boldsymbol{w}))) \max\{U_i, N_i\}\right].$$

Similar to the unemployed, non-participants enjoy leisure in the current period; their value functions are expressed as $N_i = \nu(b) + \beta \max\{U_i, N_i\}$.

A firm which is matched with a type-i worker at wage w collects the residual after paying out wage w until the job is destructed exogenously at rate δ:

$$J_i(w) = y_i - w + \beta(1-\delta) J_i(w).$$

Since firms offer contracts of the form $\boldsymbol{w} = \{w_i\}$, which potentially attracts multiple types of workers, the expected value of posting a vacancy in a submarket $\boldsymbol{w}$ is

$$V = -\kappa + \max_{\boldsymbol{w}} q(\theta(\boldsymbol{w})) \sum_i s_i(\boldsymbol{w}) J_i(w_i),$$

where $s_i(\boldsymbol{w}) \equiv u_i(\boldsymbol{w}) / \sum_{i\in\mathcal{I}} u_i(\boldsymbol{w})$ is the share of type-i workers in submarket $\boldsymbol{w}$.

3.2.2 Competitive Equilibrium

We define the recursive competitive equilibrium below. Note that the equilibrium consists of the market tightness function θ and type-distribution function s_i over the entire wage contracts available, not restricted to active submarkets. A wage contract $\boldsymbol{w}$ consists of N numbers, capturing the fact that firms can post type-specific wages.

Definition 1. A recursive equilibrium comprises a market tightness function $\theta : \mathbb{R}_+^{\mathcal{I}} \cup \{0\} \longrightarrow [0, \infty]$; the share of type-$i$ workers in each submarket $\left\{s_i : \mathbb{R}_+^{\mathcal{I}} \cup \{0\} \to [0,1]\right\}_{i\in\mathcal{I}}$; a set of active submarkets $G \equiv \{\boldsymbol{w} | \theta(\boldsymbol{w}) > 0\} \subset \mathbb{R}_+^{\mathcal{I}} \cup \{0\}$; a set of value functions for employed workers, unemployed workers, and non-participants $\{W_i^* : \mathbb{R} \to \mathbb{R}, U_i^*, N_i^*\}_{i\in\mathcal{I}}$; firms' value functions $\{J_i^* : \mathbb{R} \to \mathbb{R}\}_{i\in\mathcal{I}}$; and the measure of employed, unemployed, and non-participating workers for each type $\left\{p_{ei}^*, p_{ui}^* \, p_{ni}^*\right\}_{i\in\mathcal{I}}$ that satisfy the following conditions:

1. **Firm Optimization and Free Entry**: Given G and the distribution of job searchers $\{s_i\}_{i\in\mathcal{I}}$, firms maximize profit by choosing an optimal vacancy posting, and the expected return from creating a vacancy in each submarket satisfies the zero-profit, i.e.,

$$\kappa \;\geq\; q(\theta(\boldsymbol{w})) \sum_{i\in\mathcal{I}} \tilde{s}_i(\boldsymbol{w}) J_i(w_i), \tag{4}$$

   where $\tilde{s}_i(\boldsymbol{w}) \equiv s_i(\boldsymbol{w}) / \sum_{i\in\mathcal{I}} s_i(\boldsymbol{w})$ if $\sum_{i\in\mathcal{I}} s_i(\boldsymbol{w}) > 0$ and $\tilde{s}_i(\boldsymbol{w}) = 0$ otherwise. The free-entry condition holds with equality if $\boldsymbol{w} \in G$.

2. **Worker Optimization**: Denote

$$\bar{W}_i \equiv \max\left\{N_i^*, \max_{\boldsymbol{w}\in G} p\left(\theta\left(w\right)\right)\left\{W_i^*\left(w_i\right) - U_i^*\right\}\right\}.$$

For any $w \in \mathbb{R}_+^{\mathcal{I}} \cup \{0\}$ and $\forall i \in \mathcal{I}$,

$$\bar{W}_i \quad \geq \quad p\left(\theta\left(w\right)\right)\left\{W_i^*\left(w_i\right) - U_i^*\right\}, \tag{5}$$

with equality if $\boldsymbol{w} \in G$ and $s_i\left(\boldsymbol{w}\right) > 0$. Moreover, if $W_i^*\left(w_i\right) < U_i^*$, either $\theta\left(\boldsymbol{w}\right) = \infty$ or $s_i\left(\boldsymbol{w}\right) = 0$.

3. **Consistency**: $\forall i \in \mathcal{I}$, $p_{ei}^* + p_{ui}^* + p_{ni}^* = \pi_i$. For i with $\bar{W}_i = N_i^*$, $p_{ni}^* = \pi_i$ and $p_{ei}^* = p_{ui}^* = 0$. For i with $\bar{W}_i > N_i^*$,

$$p_{ui}^* \quad = \quad \sum_{\boldsymbol{w}\in G} s_i\left(\theta\left(\boldsymbol{w}\right)\right). \tag{6}$$

3.2.3 Characterization of the Competitive Equilibrium

Given the definition of the competitive equilibrium, we characterize the key properties of the equilibrium without government intervention. We show that each submarket only attracts one type of worker: that is, the market is endogenously segregated.

Proposition 2. *In a competitive equilibrium,* $\forall \boldsymbol{w} \in G \equiv \{\boldsymbol{w}|\theta\left(\boldsymbol{w}\right) > 0\}$, $\tilde{s}_i(\boldsymbol{w}) \in \{0, 1\}, \forall i \in \mathcal{I}$.

Proof. We use contradiction to prove this result. Suppose there exists an active submarket where at least two types of workers participate. That is, with a posted wage $\boldsymbol{w}$, $s_i(\boldsymbol{w}) > 0$ and $s_j(\boldsymbol{w}) > 0$ so that $\tilde{s}_i\left(\boldsymbol{w}\right) \in (0, 1)$ and $\tilde{s}_j\left(\boldsymbol{w}\right) \in (0, 1)$. Without loss of generality, we assume $y_i - w_i > y_j - w_j$. Suppose a firm offers an alternative contract $\hat{\boldsymbol{w}}$ with $\hat{w}_j = 0$, and $\hat{w}_k = w_k, \forall k \neq j$. It is straightforward that type-j workers do not enter this submarket, i.e. $s_j\left(\hat{\boldsymbol{w}}\right) = 0$ as $W_j^*\left(0\right) < U_j^*$.

Furthermore, we can show that this submarket must be active ($\hat{\boldsymbol{w}} \in G$) as type-$i$ workers participate in this submarket. Suppose not. Then $\kappa = q(\theta(\boldsymbol{w})) \sum_i \tilde{s}_i(\boldsymbol{w}) J_i(w_i) > q(\theta(\hat{\boldsymbol{w}})) \sum_i \tilde{s}_i(\hat{\boldsymbol{w}}) J_i(\hat{w}_i)$. Since $J_i(w_i) = J_i(\hat{w}_i)$, this inequality holds only if $\theta(\hat{\boldsymbol{w}}) = \infty$ or $s_i(\hat{w}) = 0$, $\forall i \in \mathcal{I}$. Therefore,

$$\{W_i^*(\hat{w}_i) - U_i^*\} \quad > \quad \bar{W}_i \quad = \quad p(\theta(w)) \{W_i^*(w_i) - U_i^*\}$$

as the job-finding rate $p(\cdot)$ is monotonically increasing in market tightness and $\lim_{\theta\to\infty} p(\theta) = 1$. This is a contradiction to the optimality condition of the workers. Now, we know that in equilibrium $\hat{\boldsymbol{w}} \in G$ that $\exists i \in \mathcal{I}$ s.t. $s_i(\hat{\boldsymbol{w}}) > 0$. Then $\theta(\hat{\boldsymbol{w}}) > \theta(\boldsymbol{w})$ as $\sum_i \tilde{s}_i(\hat{\boldsymbol{w}}) J_i(\hat{w}_i) > \sum_i \tilde{s}_i(\boldsymbol{w}) J_i(w_i)$ and $q(\cdot)$ is a monotonically decreasing function of market tightness. Therefore,

$$p(\theta(\hat{\boldsymbol{w}})) \{W_i^*(\hat{w}_i) - U_i^*\} \quad > \quad \bar{W}_i \quad = \quad p(\theta(\boldsymbol{w})) \{W_i^*(w_i) - U_i^*\},$$

which is a contradiction to the assumption that $\boldsymbol{w} \in G$. □

Using Proposition 2, we can simplify $\theta(\boldsymbol{w})$ with $\boldsymbol{w} \in \mathbb{R}_+^{\mathcal{I}} \cup \{0\}$ to $\theta_i(w)$ with $w \in \mathbb{R}_+ \cup \{0\}$ to denote the market tightness of the submarket for type-i with offered wage of w. Moreover, we can rewrite the firm's free-entry condition as

$$V = -\kappa + \max_w q(\theta_i(w)) J_i(w).$$

From the monotonicity of $q^{-1}(\cdot)$, we can show that the market tightness for unhealthy workers is lower than that for their healthier counterparts,

$$\theta_i(w) \quad = \quad q^{-1}\Big[\kappa\{1 - \beta(1-\delta)\} / (y_i - w)\Big]. \tag{7}$$

As the workers' job-finding rate $p(\theta)$ is monotonically increasing in the vacancy-to-unemployment ratio, it is straightforward that $p(\theta_i(w)) > p(\theta_j(w))$ if $i > j$ for $\forall w \geq 0$ as well. In words, more productive (healthy) workers face higher job-finding probabilities in equilibrium for any given wage rate.

In order to study the properties of the equilibrium wage and market tightness, we now consider the workers' problem. First, we characterize the optimal wage application w_i^* when workers without jobs exert search effort, i.e., $e_i = 1$.

Proposition 3. *There exists a unique wage w_i^* that maximizes the option value of job search for each type-i worker.*

Proof. The associated first order condition (FOC) of the unemployed worker of type-i's optimal job-search problem reads

$$\frac{\nu'\left(w_i^*\right)}{1-\beta\left(1-\delta\right)} = \frac{1-\eta}{\eta}\frac{\nu\left(w_i^*\right)-\nu\left(b\right)+\phi}{\left[1-\beta\left\{1-\delta-p\left(\theta_i\left(w_i^*\right)\right)\right\}\right]\left(y_i-w_i^*\right)}, \tag{8}$$

where η is the elasticity of the matching function with respect to unemployment. There exists a unique optimal wage w_i^* as the marginal benefit (the left-hand-side, LHS) of searching in a submarket with a higher wage is monotonically decreasing in w while the marginal cost (the right-hand-side, RHS) is monotonically increasing. □

Using equation (8), we can also show that the equilibrium wage and job-finding rate are monotonically increasing in the type (health or productivity) of workers.

Proposition 4. *In a competitive equilibrium, $w_i^* > w_j^*$ and $\theta_i(w_i^*) > \theta_j(w_j^*)$ for $i > j$ ($y_i > y_j$).*

Proof. By applying the Implicit Function Theorem on FOC (equation (8)) and the equilibrium market tightness conditions, we get $\partial w_i^*/\partial y > 0$ and $\partial\theta_i\left(w_i^*\right)/\partial y > 0$. □

Lastly, in equilibrium, there exists a cut-off health type above which workers participate in the labor market ($U_i > N_i$).[17]

[17] Proof included in Appendix B.

3.3 Analyzing the Effects of the Americans with Disabilities Act

In this section, we introduce the ADA into our model and analyze the consequences of the employment protection policy. The ADA has four main clauses that are aimed at protecting disabled workers in the labor market: (1) no discrimination in firing; (2) mandated provision of reasonable accommodations for disabled employees; (3) no discrimination in hiring; and (4) no discrimination in wage compensation. After the ADA came into effect, it became possible for employees who believe to have been discriminated to file charges against their employers. Thus, the behavior of firms in the labor market would change, and their responses will depend on the relative costs of violating (or abiding by) each clause in the law. In the following, we model the main clauses separately and analyze their impact. For simplicity, we now assume that there are two types of workers, non-disabled (A) and disabled (D), with $y_A > y_D$, and denote the share of non-disabled (disabled) workers by π $(1 - \pi)$.[18]

3.3.1 Firing Costs and Reasonable Accommodations

When a firm and a disabled employee separate, the employee files charges against his employer with a positive probability, and we denote the firm's expected cost from the lawsuit by C_f. Similarly, we assume a firm is required to provide reasonable accommodations, which incurs an additional cost of C_a per worker in each period.[19]

The introduction of C_f and C_a therefore affects the firms' value of matching

[18] The qualitative results do not change when we consider multiple types.

[19] Our assumption is based on the empirical evidence of the negative impact of mandated accommodations on wage compensations for the disabled (Charles, 2004). Moreover, Hill, Maestas and Mullen (2015) documents that among the workers with accommodations, 37% received a type of accommodation related to flexible working hours and 33% received changes in their job duties. These accommodations are a per-worker cost for the firms, rather than a fixed cost, supporting our modeling choice.

with a disabled worker. Specifically, the value function of a firm matched with a disabled worker under the ADA becomes

$$\begin{aligned}\tilde{J}_D(w) &= (y_D - C_a) - w + \beta\left\{(1-\delta)\tilde{J}_D(w) - \delta C_f\right\} \\ &= \tilde{y}_D - w + \beta(1-\delta)\tilde{J}_D(w),\end{aligned}$$

where $\tilde{y}_D \equiv y_D - C_a - \beta\delta C_f$. The implementation of firing costs and reasonable accommodations effectively lowers the net productivity of disabled employees from y_D to $\tilde{y}_D$.

3.3.2 Hiring Costs and Non-discriminatory Wage Compensation

Now, we jointly study the hiring and wage compensation clauses of the ADA. In the current framework, a contract consists of type-specific wages. Therefore, firms can effectively practice discriminatory hiring by posting a discriminatory wage contract to only attract one type of worker. Thus, we allow firms to take either one of the two choices: (i) pay a hiring discrimination cost (C_h) and post discriminatory wage contracts ($w_A \neq w_D$) to preferentially hire healthy workers; or (ii) treat both workers equally by posting equal wages ($w_A = w_D$) for both types.[20] We restrict our analysis to symmetric equilibria, where every firm makes the wage posting decision and the same type of workers visit the same submarket.

3.3.3 Competitive Equilibria with the ADA

Using the firm's profit maximization problem and job-posting decision under the ADA, we define a recursive equilibrium under the employment protection laws and analyze possible equilibria. We focus on two types of equilibrium: a Discriminatory Equilibrium (DE), where firms optimally choose option (i), and a Non-

[20] Note that the firms cannot reject any applicants. They can only discourage workers from applying to the job by posting a wage contract that is not attractive enough for a specific group of applicants.

Discriminatory Equilibrium (NDE), where firms choose option (ii).

Definition 5. Given policy parameters, $\{C_f, C_a, C_h\}$, a recursive equilibrium consists of $\theta : \mathbb{R}^2_+ \cup \{0\} \to [0, \infty]$; $G \subset \mathbb{R}^2_+ \cup \{0\}$; $\{W^*_i : \mathbb{R} \to \mathbb{R}, U^*_i\}_{i \in \{A,D\}}$; $\left\{J^*_A, \tilde{J}^*_D : \mathbb{R} \to \mathbb{R}\right\}$; $\left\{s_i : \mathbb{R}^2_+ \cup \{0\} \to [0,1]\right\}_{i \in \{A,D\}}$; and $\{p^*_{ei}, p^*_{ui}\}_{i \in \{A,D\}}$ that satisfies the conditions (5), (6), and the free entry condition of firms: Given G and $\{s_i\}_{i \in \{A,D\}}$, firms maximize profit by choosing the optimal vacancy posting, and the expected return from creating a vacancy in each submarket satisfies the zero-profit condition:

$$\kappa \quad + C_h \mathbb{I}_{\{w_A \neq w_D\}} \geq \quad q(\theta(\boldsymbol{w})) \left\{ \tilde{s}_A(\boldsymbol{w}) J_A(w_A) + \tilde{s}_D(\boldsymbol{w}) \tilde{J}_D(w_D) \right\}, \tag{9}$$

where $\tilde{s}_i(\boldsymbol{w}) \equiv s_i(\boldsymbol{w}) / \sum_{i \in \{A,D\}} s_i(\boldsymbol{w})$ if $\sum_{i \in \{A,D\}} s_i(\boldsymbol{w}) > 0$ and $\tilde{s}_i(\boldsymbol{w}) = 0$ otherwise. The free-entry condition holds with equality if $\boldsymbol{w} \in G$.

Using the above definition, we can specify two types of equilibrium based on the characteristics of active submarkets.

Definition 6. Given policy parameters $\{C_f, C_a, C_h\}$, a **Discriminatory Equilibrium** (DE) consists of $\check{\theta}^{DE} : \mathbb{R}^2_+ \cup \{0\} \to [0, \infty]$; $\check{G} \equiv \left\{ \left(\check{w}^{DE}_A, 0\right), \left(\check{w}^{DE}_D, \check{w}^{DE}_D\right) \right\} \subset \mathbb{R}^2_+ \cup \{0\}$; $\{W^*_i : \mathbb{R} \to \mathbb{R}, U^*_i\}_{i \in \{A,D\}}$; firms' value functions $\left\{J^*_A, \tilde{J}^*_D : \mathbb{R} \to \mathbb{R}\right\}$; the share of type-$i$ workers in each submarket such that $s^{DE}_A\left(\left(\check{w}^{DE}_A, 0\right)\right) = \pi$ and $s^{DE}_D\left(\left(\check{w}^{DE}_D, \check{w}^{DE}_D\right)\right) = 1 - \pi$; and $\{p^*_{ei}, p^*_{ui}\}_{i \in \{A,D\}}$ that satisfies the conditions (5), (6), and (9).

If firms post a non-discriminatory wage contract, then the set of active submarket collapses to (w_A, w_D) where $w_A = w_D$ instead of submarkets targeted for each type, $\left(\check{w}^{DE}_A, 0\right)$ and $\left(\check{w}^{DE}_D, \check{w}^{DE}_D\right)$.

Definition 7. Given policy parameters $\{C_f, C_a, C_h\}$, a **Non-Discriminatory Equilibrium** (NDE) consists of $\hat{\theta}^{NDE} : \mathbb{R}^2_+ \cup \{0\} \to [0, \infty]$; $\hat{G} \equiv \left\{ \left(\hat{w}^{NDE}, \hat{w}^{NDE}\right) \right\}$;

$\left\{W_i^* : \mathbb{R} \to \mathbb{R}, U_i^*\right\}_{i\in\{A,D\}}$; $\left\{J_A^*, \tilde{J}_D^* : \mathbb{R} \to \mathbb{R}\right\}$; the share of type-$i$ workers in the submarket such that $s_A^{NDE}\left(\hat{\boldsymbol{w}}^{NDE}\right) = \pi$ and $s_D^{NDE}\left(\hat{\boldsymbol{w}}^{NDE}\right) = 1-\pi$; and $\{p_{ei}^*, p_{ui}^*\}_{i\in\{A,D\}}$ that satisfies the conditions (5), (6), and (9).

In the Non-Discriminatory Equilibrium, the market tightness is

$$\hat{\theta}^{NDE}(w) \;=\; q^{-1}\Big[\kappa\{1-\beta(1-\delta)\}/(\hat{y}_{NDE}-w)\Big], \tag{10}$$

where $\hat{y}_{NDE} = \pi y_A + (1-\pi)\tilde{y}_D$, the average net productivity of the labor force weighted by the population share.[21]

3.3.4 Characterization of the Equilibrium with the ADA

Having defined two candidates for equilibria, in this section, we explore the conditions that determine which equilibrium arises under the ADA, and the welfare consequences of the law for both the non-disabled and disabled workers. In doing so, we focus attention on the case in which both types of workers participate in the labor market, i.e., $U_i > N_i, \forall i \in \{A, D\}$.[22] As the introduction of the ADA affects the value of employment and unemployment through changes in the wage rates and the job finding rates, it is possible for the workers to have higher (or lower) incentives to drop out of the labor force. We discuss the effects of the ADA on extensive margin decisions of workers in Discriminatory and Non-Discriminatory Equilibria in Appendix B.

Lemma 8. *For any wage $w \geq 0$ satisfying the free-entry conditions, $\hat{\theta}^{NDE}(w) > \tilde{\theta}_A^{DE}(w)$ if $(\hat{y}_{NDE}-w)/\kappa > (y_A-w)/(C_h+\kappa)$.*

Proof. This is straightforward from the equilibrium market tightness conditions in

[21] Under the ADA, the net productivity of disabled workers ($\tilde{y}_D$) decreases by firing ($\beta\delta C_f$) and accommodation costs (C_a) compared to before (y_D).

[22] In the following, we omit the phrase "If both types of workers participate in the labor market," in the statement of Lemmas and Propositions (Lemma 8 – Proposition 11).

NDE and DE, specified in equations (7) (for type A with discriminatory wage posting cost of $\kappa + C_h$) and (10). $\square$

Proposition 9. *A Non-Discriminatory Equilibrium arises if* $\hat{\theta}^{NDE}(w) > \check{\theta}_A^{DE}(w)$*,* $\forall w \geq 0$*.*

Proof. We prove this result by contradiction. Suppose there exists a Discriminatory Equilibrium with equilibrium wage rates of w_A and w_D. Denote by H (L) the type receiving higher (lower) wage between $\{w_A, w_D\}$. From Lemma 8, $\hat{\theta}^{NDE}(w) > \check{\theta}_i^{DE}(w)$ for both types. Then, we can classify the equilibrium into the following three cases: (i) $\check{\theta}_L^{DE}(w) < \check{\theta}_H^{DE}(w)$, $\forall w \in [w_L, w_H]$; (ii) $\check{\theta}_H^{DE}(w_H) < \check{\theta}_L^{DE}(w_H)$ and $\check{\theta}_H^{DE}(w_L) > \check{\theta}_L^{DE}(w_L)$; and (iii) $\check{\theta}_H^{DE}(w_H) > \check{\theta}_L^{DE}(w_H)$ and $\check{\theta}_H^{DE}(w_L) < \check{\theta}_L^{DE}(w_L)$.

In the first two cases, there exists a non-discriminatory wage contract w_p that makes type-H indifferent, i.e.,

$$p\left(\check{\theta}_H^{DE}(w_H)\right)\{W(w_H) - U\} \quad = \quad p\left(\hat{\theta}^{NDE}(w_p)\right)\{W(w_p) - U\}.$$

Since $\hat{\theta}^{NDE}(w) > \check{\theta}_i^{DE}(w)$, the non-discriminatory wage w_p must be strictly lower than w_H ($w_p < w_H$). Moreover,

$$\begin{aligned} p\left(\check{\theta}_L^{DE}(w_L)\right)\{W(w_L) - U\} &< p\left(\check{\theta}_H^{DE}(w_H)\right)\{W(w_H) - U\} \\ &= p\left(\hat{\theta}^{NDE}(w_p)\right)\{W(w_p) - U\}. \end{aligned}$$

Thus, the optimality condition for type-L (at w_L) is violated.

For the last case, we define a non-discriminatory wage contract w_p such that

$$\begin{aligned} & p\left(\hat{\theta}^{NDE}(w_p)\right)\{W(w_p) - U\} \\ = \quad & \max\left\{p\left(\check{\theta}_H^{DE}(w_H)\right)\{W(w_H) - U\}, p\left(\check{\theta}_L^{DE}(w_L)\right)\{W(w_L) - U\}\right\} \end{aligned}$$

We know that such wage w_p exists from the fact that $\hat{\theta}^{NDE}(w) > \check{\theta}_i^{DE}(w)$. Then the fact that at least one type of workers can be better off from applying to the submarket (w_p, w_p) is a contradiction to the optimality condition of workers. $\square$

Proposition 9 essentially analyzes the trade-offs that firms face in determining their hiring methods. When firms post a wage contract $(w_A, w_D) = (w, 0)$, they can exclusively hire healthy workers who produce y_A. Due to the ADA, however, they face legal costs summarized as C_h. The alternative hiring method is to post a non-discriminatory wage contract targeting lower average productivity $(\hat{y}_{NDE} < y_A)$ without paying C_h. Lemma 8 states the condition where the expected return from complying with the hiring clause of the ADA dominates the expected return from preferential hiring, making both firms and workers better off.

As shown in Lemma 8, the policy parameters $\{C_f, C_a, C_h\}$, as well as the fundamental parameters of the model $\{y_A, y_D, \pi\}$, are important determinants of which equilibrium is likely to arise. Intuitively, if the cost of discriminatory hiring C_h is relatively small and/or the cost of hiring a disabled worker is high due to C_a and C_f (reflected in $\tilde{y}_D$ and thus $\hat{y}_{NDE}$), firms find it optimal to discriminate in order to reap higher benefits from more productive workers. Moreover, fixing the policy parameters, if productivity differences between non-disabled and disabled workers are large and/or the share of disabled workers $(1 - \pi)$ is high (both reflected in $\hat{y}_{NDE}$), then the benefit from discrimination increases, and it becomes more likely that the DE would arise.

We conclude this section by comparing outcomes from two potential equilibria under the ADA to those of the competitive equilibrium without government intervention.

Proposition 10. *In a Discriminatory Equilibrium, the job-finding rates and wages of both types are lower than those under the competitive equilibrium:* $\check{\theta}_i^{DE} < \theta_i^{CE}$

and $\breve{w}_i^{DE} < w_i^{CE}$ *for* $i = A, D$.

Proof. By the Implicit Function Theorem with respect to productivity for the disabled ($\tilde{y}_D < y_D$) and the cost of posting vacancies for the non-disabled ($\kappa + C_h > \kappa$), and the equilibrium market tightness conditions. □

In DE, firms still offer separate wage contracts by health status. Consequently, workers solve their optimal wage ($\breve{w}_i^{DE}$) based on their health-specific trade-off between market tightness and wage. Their equilibrium wages and job-finding rates decline as both types of workers experience deterioration in terms-of-trade after the passage of the ADA.

Proposition 11. *In a Non-Discriminatory Equilibrium, the job-finding rate and wage decrease for type-*A *workers compared to the competitive equilibrium. If* $C_a + \beta\delta C_f \leq (\pi/(1-\pi))(y_A - y_D)$, *then the job-finding rate and wage of type-*D *workers increase compared to the competitive equilibrium.*

Proof. With a non-discriminatory wage contract, the FOC of the unemployed workers is

$$\frac{\nu'\left(\hat{w}^{NDE}\right)}{1-\beta(1-\delta)} = \frac{1-\eta}{\eta}\frac{\nu\left(\hat{w}^{NDE}\right) - \nu(b) + \phi}{\left[1-\beta\left\{1-\delta-p\left(\hat{\theta}^{NDE}\left(\hat{w}^{NDE}\right)\right)\right\}\right]\left(\hat{y}_{NDE} - \hat{w}^{NDE}\right)} \tag{11}$$

for both types of workers. Applying the Implicit Function Theorem, we can show that non-disabled workers are worse off with a lower wage and lower job-finding rate. However, disabled workers are better off with a higher wage and job-finding rate as $\hat{y}_{NDE} > y_D$ when $C_a + \beta\delta C_f \leq (\pi/(1-\pi))(y_A - y_D)$. □

In equation (11), the marginal benefit curve (LHS) remains the same in both the competitive equilibrium and the NDE, while the marginal cost (RHS) of job search after the ADA increases for type-A workers, lowering the equilibrium wage and job-finding rate of the non-disabled. On the other hand, as long as the ADA does not reduce the average productivity of the entire workforce below the pre-ADA productivity of disabled workers (i.e., $\hat{y}_{NDE} > y_D$), the equilibrium wage and job-finding rate of disabled workers improve compared to the competitive equilibrium outcomes without the policy. This improvement comes at the cost of a reduction in the wage and job-finding rate of non-disabled workers.[23]

In this section, we developed a general equilibrium model to analyze the importance of the firms' hiring margin in labor market outcomes after the implementation of employment protection policies. The model generates two potential outcomes from the new policy, where the outcomes depend on the relative cost associated with firing/accommodations (C_f and C_a) and hiring/wage (C_h) discrimination clauses of the ADA. Our model demonstrates that if the cost firms face from preferentially hiring workers (thereby violating the law) is (relatively) high, the government regulation can induce cross-subsidization between healthy and unhealthy workers, improving the welfare of unhealthy workers compared to in the competitive equilibrium. However, if the ADA is implemented with a relatively small C_h and higher C_f and/or C_a that effectively lower the productivity of the disabled, the regulation can have unintended consequences, worsening the labor market outcomes of the disabled. In both types of equilibria, non-disabled workers are worse off: in the DE, they are hurt due to the hiring cost penalty, whereas in the NDE, they cross-subsidize disabled workers. Our goal in the next section is to empirically estimate the impact of the law on disabled and non-disabled workers.

[23] In Acemoglu and Angrist (2001), disabled workers may also experience higher wages and employment rates, but they are due to hiring subsidies of the ADA, rather than the cross-subsidization present in our model.

4 Empirical Analysis

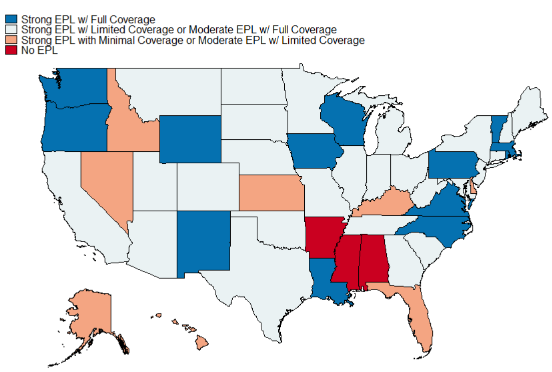
In Section 3, we showed that there are two types of potential equilibria under the ADA and argued that the labor market outcomes of disabled workers could worsen or improve after the implementation of the ADA. The goal of our empirical analysis is to measure the actual impact of the ADA on labor market transition rates, using the variation in state-level employment protection policies prior to the ADA. We use these estimates to infer the relative size of the policy parameters measuring the costs associated with each clause in the ADA, and discuss their implications for the labor market outcomes of the disabled.

4.1 The Degree of State-Level Employment Protection Variables

We define the degree of pre-ADA state-level employment protection based on two criteria: similarity to the ADA and the scope (coverage) of the legislation. For the first criterion, we follow the classification of Jolls (2004). The two key elements of the ADA are the prohibition of discrimination (in, for example, hiring, firing, and compensation) based on disability and the provision of reasonable accommodations. According to Jolls' definition, 18 states had already implemented state-level labor protection laws for the disabled similar to the ADA, including the mandate on reasonable accommodations. Among the remainder, 29 states had limited labor protection prior to the ADA that included anti-discrimination laws, but did not include the mandate on reasonable accommodations, while the rest (3 states) did not have any state-level protection laws.

The second criterion that we incorporate is the scope of the legislation. While the ADA is enforced for both public and private employers and covers physical and mental disabilities, in some states, pre-ADA employment protection laws were not equally applied to private firms or for mental disabilities. For instance, the employment protection laws of the state of Idaho strictly prohibited discrimination prior to the ADA. However, the private sector was excluded from these laws, and only public employers were covered. Since less than 15% of the state's employees were public, it is difficult to conclude that disabled residents in Idaho could easily claim these legal protections. To reflect the range of employment protection laws, we take the classification from Percy (1989). We classify a state as having full coverage in employment protection coverage if it not only included public sector and physical disabilities but also covered both private sector employees and those with mental disabilities; 37 states satisfied this criteria. However, in 7 states, the employment laws did not include private sector employees or mental disabilities, and thus only had partial coverage. The remaining 5 states excluded both private sector and mental disabilities, only enforcing the laws for public sector employers and covering workers with physical disabilities (if at all).

FIGURE 3
SPATIAL VARIATIONS IN PRE-ADA EMPLOYMENT PROTECTION LAWS



		Similarity		
		Full	Weak	None
Scope		18	29	3
Full	37	**14**	23	0
Partial	8	2	6	0
Minimal	5	2	0	**3**

Note: In the table on the right, we divide states into nine bins by the similarity of their pre-ADA employment protection to the ADA (Full, Weak, or None) and their scope (Full, Partial, or Minimal). The states colored in dark blue, light blue, orange, and red on the map represent states with Strong (Full Scope-Full Similarity), Moderate (Full-Weak or Partial-Full), Weak (Minimal-Full or Partial-Weak), and No protection (Minimal-None), respectively. The discussion on our classification criteria is described in detail in the main text and in Appendix C.

In the right panel of Figure 3, we construct a table with the full classification of all 50 states according to the two criteria described above.[24] For the empirical

[24]The detailed list of states of our classification and their descriptive statistics are summarized in Appendix C.

analysis, we classify states with a strong (full) protection in terms of either scope or similarity and at least partial in scope or weak in similarity (a total of 39 states) as the control group, and the others as the treatment group.

4.2 Empirical Strategy

In this section, we present our empirical specification for estimating the effects of the ADA, and establish the linkage between the theoretical analysis in Section 3 and predictions from the estimation.

Difference-in-Difference Estimator To estimate the effects of the ADA, we conduct a standard difference-in-difference (DD) estimation by exploiting the spatial variation in the degree of employment protection prior to the introduction of the ADA in 1990. Conditional on the current period's labor market status $l_{i,s,t} \in \{\text{Non-Employment } (N), \text{ Employment } (E)\}$, we estimate the probability of the labor market status in the following year for an individual i in state s at time t using the following linear probability model:

$$\begin{aligned} & l_{i,s,t+1} \\ = \; & \mathbb{I}_{\{\text{Disabled}\}}\left\{\beta_0^D + \beta_1^D \mathbb{I}_{\{\text{No Protect}\}} + \beta_2^D \mathbb{I}_{\{\text{t>90}\}} + \beta_3^D \mathbb{I}_{\{\text{t>90}\}}\mathbb{I}_{\{\text{No Protect}\}}\right\} \\ & + \mathbb{I}_{\{\text{Non-Disabled}\}}\left\{\beta_0^{ND} + \beta_1^{ND} \mathbb{I}_{\{\text{No Protect}\}} + \beta_2^{ND} \mathbb{I}_{\{\text{t>90}\}} + \beta_3^{ND} \mathbb{I}_{\{\text{t>90}\}}\mathbb{I}_{\{\text{No Protect}\}}\right\} \\ & + \alpha_s + \beta X_i + \epsilon_{i,s,t}, \end{aligned} \tag{12}$$

where D indicates individuals with disabilities and ND, those without disabilities. In the estimation, the time-invariant state fixed effects are captured by α_s, and individual characteristics–age, education, race, and gender–by X_i.[25] Following

[25] Aggregating the data into state-level using the residuals from the individual-level regression deliver the similar statistical results. We report the results from the alternative estimation model in Appendix D.3.

Bertrand, Duflo and Mullainathan (2006) and Foote (2007), we collapse the data into pre- and post- periods to reduce the bias from the time-series correlation of samples and cluster standard errors ϵ_{it} at the state-level.

All the coefficients in our specification enter with health ($h = \{D, ND\}$) status dummies, where β_0^h controls time invariant health-type effects; β_1^h, fixed-effects of No-Protection states; and β_2^h, post-ADA effects on transition probabilities. The coefficient of interest is β_3^h, which captures the relative change in transition rates of each type of worker in No-Protection states after the passage of the ADA compared to the worker of the same type in Protection states.

From Market Tightness to Worker Flows We use annual transition rates from employment to employment (E-to-E) and from non-employment to non-employment (N-to-N) as our measures of economic outcomes. These two measures are tightly related to the equilibrium labor market tightness θ, which is defined as the number of available openings per job seeker.

Our dataset allows us to observe the labor market status of an individual in annual frequency even though their labor market search activities may occur more frequently. For example, suppose the labor market search happens every spring and fall. In such a case, we expect to observe an employed person in the spring of year t to be employed after a year with the following probability:

$$\mathbf{Pr}\left[l_{t+1} = E_{t+1} \middle| \, l_t = E_t \right] = (1-\delta)^2 + \delta p(\theta), \tag{13}$$

and there is a positive relationship between the true job-finding rate (and the market tightness) and the observed employment-to-employment transition, as a change in θ by $\Delta\theta$ leads to a change in the transition of $\Delta\mathbf{Pr}\left[E_{t+1} \middle| \, E_t \right] = \delta p'(\theta)\,\Delta\theta$. Similarly, the probability of transition from non-employment to non-employment in year t is given by

$$\mathbf{Pr}\left[\left. l_{t+1}=N_{t+1}\right| l_t=N_t\right] \quad = \quad (1-p(\theta))^2+p(\theta)\,\delta, \tag{14}$$

with the change induced by $\Delta\theta$ is $\Delta\mathbf{Pr}\left[\left. N_{t+1}\right| N_t\right]=\{\delta-2\,(1-p\,(\theta))\}\,p'\,(\theta)\,\Delta\theta$. From the standard estimates of the job-finding and job-separation rates in the literature, the transition probability from non-employment to non-employment is decreasing in the equilibrium market tightness θ as $\delta-2\,(1-p\,(\theta))<0$.

This example illustrates the expected relationship between the labor market transition rates and the equilibrium labor market condition (market tightness) of workers. The E-to-E transition rate increases (decreases) when the labor market conditions of workers improve (deteriorate), with a higher (lower) market tightness θ. On the other hand, an increase (decrease) in market tightness θ decreases (increases) the N-to-N transition.

Mapping the Predictions from the Model to the Empirical Analysis Comparing the signs of the coefficient of the disabled on the effect of the ADA (β_3^D) allows us to distinguish two possible outcomes of the ADA. According to our theoretical analysis in Section 3, the effects of the employment protection policy vary depending on the response of the firms, as two different types of equilibrium exist. In a Non-Discriminatory Equilibrium, firms comply with the ADA and provide nondiscriminatory wages regardless of the health types of workers. As a consequence, the labor market outcomes of disabled workers improve at the cost of healthier types. Therefore, we would observe a positive coefficient for E-to-E ($\beta_{3,EE}^D>0$) and a negative coefficient for N-to-N ($\beta_{3,NN}^D<0$) transition rates. On the other hand, the labor market outcomes of disabled workers would worsen after the implementation of the ADA ($\beta_{3,EE}^D<0$ and $\beta_{3,NN}^D>0$) if the Discriminatory Equilibrium arises.

Unlike the disabled, we expect to observe negative effects of the ADA for non-disabled workers regardless of the equilibrium type ($\beta_{3,EE}^{ND}<0$ and $\beta_{3,NN}^{ND}>0$). In the NDE, the E-to-E transition declines as the non-disabled cross-subsidize the disabled, lowering their job-finding rates compared to in the economy without the ADA. They also experience a deterioration in the labor market under the DE, due to the hiring cost C_h. The magnitude of the decline would indicate the significance of the cost of hiring C_h associated with the ADA.

4.3 Estimation Results

Employment-to-Employment Table 3 contains the results from our estimation of equation (12). We report the full estimation results in Table 9 in Appendix D. We report our analysis using non-disabled workers as our basis. The first row of Table 3 indicates that the mean probability of a non-disabled individual with a job in year t being employed in year $t+1$ is 60.1%. On average, the probability for the same E-to-E transition is 39.5% (20.6 percentage points lower) for an employed disabled worker with the same characteristics. Panel B of Table 3 summarizes the effects of the ADA. We first note that $\beta^{D}_{3,EE}$ for the disabled is negative and significant at 5%, which implies that due to the ADA disabled workers experienced a 6 percentage point drop in their E-to-E transition rates. On the other hand, the coefficient $\beta^{ND}_{3,EE}$ is not significantly different from zero, indicating that the ADA did not have an adverse effect on non-disabled workers.

Non-Employment-to-Non-Employment The second column of Table 3 reports the results from our DD estimation based on N-to-N transition flows. For non-employed individuals without disability, the mean probability of being non-employed in year $t+1$ is 67.8%. All else being equal, the same estimated transition rate is 88.1% (20.3 percentage points higher) for an individual with disabilities. Panel B of Table 3 contains the estimated effects of the ADA. After the introduction of the ADA, there was a significant increase of 1.3 percentage points (captured by $\beta^{D}_{2,NN}$) in N-to-N transitions among disabled workers in both Protection and No-Protection states. On the other hand, we see a significant decrease of 3.9 percentage points

TABLE 3
EFFECTS OF THE ADA ON WORKER FLOWS BY HEALTH STATUS

	E-to-E		N-to-N	
A. Predicted Probabilities				
Non-Disabled	0.601^{***}		0.678^{***}	
	$[0.58, 0.62]$		$[0.63, 0.72]$	
Disabled,	-0.206^{***}		0.203^{***}	
Diff. from ND	$[-0.23, -0.18]$		$[0.19, 0.21]$	
B. The Effects of the ADA				
	$\beta_{2,EE}$	$\beta_{3,EE}$	$\beta_{2,NN}$	$\beta_{3,NN}$
Non-Disabled	0.004^{**}	-0.002	-0.039^{***}	0.009
	$[0.0, 0.01]$	$[-0.01, 0.002]$	$[-0.05, -0.03]$	$[-0.017, 0.04]$
Disabled	0.006	-0.058^{**}	0.013^{**}	0.003
	$[-0.04, 0.05]$	$[-0.11, -0.004]$	$[0.004, 0.02]$	$[-0.01, 0.02]$
Number of Obs.	299,319		85,723	

Note: Table 3 reports the estimated transition probabilities of an individual by health status and state category based on the linear probability model (12). Numbers in brackets indicate 95% confidence intervals for the probability estimates using the standard errors clustered by states. The March supplement weights are used for estimations. *** $p < 1\%$, ** $p < 5\%$, and * $p < 10\%$.

($\beta_{2,NN}^{ND}$) in N-to-N transitions among non-disabled workers. The different signs on N-to-N transitions, therefore, suggest that there was a macroeconomic factor that adversely affected only the disabled workers, but not non-disabled workers.[26] While disabled individuals in both states experienced the increase in N-to-N after the introduction of the ADA, the relative difference in the increase in transition rates was not statistically different across Protection and No-Protection states. Therefore, based on our model specification, we cannot conclude that the ADA played a distinctive role in the increase in the N-to-N transition rate.

[26] One possible explanation for the widening gap in the N-to-N transition rates between the non-disabled and disabled workers in all states is the steady increase in the Social Security Disability Insurance program, which occurred since the 1980s (most notably after the Social Security Disability Benefits Reform Act of 1984). The DI program in the U.S. is in large part, a federal program, and State Disability Insurance programs are very limited (only California, Hawaii, New Jersey, New York, and Rhode Island provide one and most tend to be temporary programs), and thus it could have affected the job-finding incentives of individuals with disabilities in all states.

Interpretation of the Results First and foremost, we note that the ADA had a significantly negative impact on the disabled workers' E-to-E transition rates, consistent with the predictions of the Discriminatory Equilibrium. If the economy were in the Non-Discriminatory Equilibrium (NDE), we would observe a positive coefficient for the changes in the E-to-E transition for the disabled.

In our theoretical analysis of the DE, we show that the job-finding rate for the non-disabled goes down, as firms incur a pecuniary cost from discriminatory hiring. The magnitude of this inefficiency is determined by C_h, the cost of selectively hiring non-disabled workers using a discriminatory wage contract instead of complying with the ADA. In our empirical analysis, this effect is measured by the decline in the E-to-E transition of the *non-disabled* workers, $\beta_{3,EE}^{ND}$. As $\beta_{3,EE}^{ND}$ is not significantly different from zero, we conclude that the hiring cost C_h is small.

Now, in order to understand the decreasing E-to-E transition rate and the constant N-to-N transition rate, we revisit the transition equations (13) and (14) from the simple two-period model in Section 4.2. We relax the assumption of fixed δ and analyze the effect of changing δ on transition rates after the ADA.[27] In this alternative specification, the effects of the ADA on the transition rates can be written as a weighted sum of changes in the job-separation rate $\Delta\delta$ and market tightness $\Delta\theta$ (and thus the job-finding rate, $p^{'}(\theta)\,\Delta\theta$):

$$\begin{aligned}\Delta\mathbf{Pr}\left[E_{t+1}|\,E_t\right] &= \left[p(\theta)-2(1-\delta)\right]\Delta\delta+\delta p^{'}(\theta)\,\Delta\theta\\ \Delta\mathbf{Pr}\left[N_{t+1}|\,N_t\right] &= p(\theta)\,\Delta\delta+\left[\delta-2(1-p(\theta))\right]p^{'}(\theta)\,\Delta\theta.\end{aligned}$$

With standard parameters in the literature, $p(\theta)-2(1-\delta)<0$ and $\delta-2(1-p(\theta))$ <0. Thus, it is clear from the above expressions that a significant decline in the

[27] The predictions of the previous baseline model correspond to the case where $\Delta\delta=0$, that yield a lower E-to-E transition and a higher N-to-N transition in a DE as disabled workers face lower job-finding rates (due to positive C_f and C_a).

E-to-E transition rate ($\Delta\mathbf{Pr}\left[E_{t+1}\middle|E_t\right] < 0$) is not feasible with $\Delta\delta < 0$ (a decrease in the job-separation rate) *and* $p^{'}(\theta)\,\Delta\theta > 0$ (an increase in the job-finding rate). Therefore, even with an insignificant change in the N-to-N transition rates, we can conclude that the ADA had adverse labor market consequences for disabled workers.

Qualitatively, we can further show that a lower job-finding rate ($p^{'}(\theta)\,\Delta\theta < 0$) and a lower job-separation rate ($\Delta\delta < 0$) can be consistent with our empirical findings ($\Delta\mathbf{Pr}\left[E_{t+1}\middle|E_t\right] < 0$ and $\Delta\mathbf{Pr}\left[N_{t+1}\middle|N_t\right] \approx 0$). These results imply that firms are less likely to fire disabled workers due to the threat of lawsuits they could face under the ADA. Facing a high C_f makes it harder for firms to terminate employment ($\Delta\delta < 0$) and simultaneously reduces incentives to hire disabled workers ($p^{'}(\theta)\,\Delta\theta < 0$). As a consequence, these two changes could lead to smaller changes in the transition rates compared to the underlying decline in the job-finding rate $p(\theta)$.[28]

Thus far, we inferred the costs of the four main clauses of the ADA by mapping our theoretical framework based on labor markets with search frictions to our empirical findings. Our analysis allows us to not only evaluate the total effect of the law, but also to understand the mechanism behind it. In the following subsection, we use our estimates to quantify the effects on the employment rate of the disabled.

Effects on the Employment Rate of the Disabled We can calculate the impact of the ADA on the employment rate of disabled workers based on our estimated transition rates. The short-run employment rate following the passage of the ADA for the disabled is

[28] According to a field experiment conducted by Ameri et al. (2015), fictional job applicants who reveal their disability statuses received 26% fewer signals of employer interest than those without disabilities (spinal cord injury and Asperger's Syndrome), even though the disability did not affect occupation-specific productivity (accounting job). Their finding is in line with our claim that firms might be discriminating workers at the hiring stage, the incentive of which is strengthened with high firing costs.

$$e_{t+1} = e_t \mathbf{Pr}\left[E_{t+1} | E_t\right] + (1 - e_t)\,\mathbf{Pr}\left[E_{t+1} | N_t\right],$$

where e_t is the employment rate of disabled workers in year t. According to our back-of-the-envelope calculation, we find that in the short run, the ADA lowered the employment rate of the disabled by 2.2 percentage points (5.7%).[29] When we compute the long-run employment rate under the assumption of constant transition from N-to-E and E-to-N at the steady-state, the decrease is smaller at 1.5 percentage points.[30] DeLeire (2000) finds that after the ADA, the employment rate of disabled workers decreased 7.2 percentage points, and Acemoglu and Angrist (2001) finds that average weeks worked by males decreased between 1.4 and 2.1 (a 7% to 13% drop). On the other hand, Kruse and Schur (2003) reports an increase in employment for workers with functional and activity limitations. Our findings are qualitatively consistent with those of Acemoglu and Angrist (2001) and DeLeire (2000), but the estimated impact of the ADA is smaller than theirs.

In this section, we have empirically estimated the causal impact of the ADA on the labor market performance of disabled and non-disabled workers by exploiting the cross-state variation in pre-ADA employment protection laws. Our empirical findings are consistent with the predictions of the Discriminatory Equilibrium, where labor market conditions for disabled workers worsened after the ADA. This suggests that firms face a relatively low cost from preferentially hiring non-disabled workers, while the cost from firing disabled workers is relatively high.

[29] We use $e_t = 0.35$, to be (roughly) consistent with the employment rates reported in Appendix A.2.

[30] The long-run steady-state employment rate is defined by $f/(s+f)$, where s and f are the E-to-N transition and the N-to-E transition respectively.

5 Conclusion

In this paper, we theoretically and empirically analyzed the effects of the Americans with Disabilities Act, an employment protection policy for disabled workers in the United States. Using a general equilibrium model with frictional labor markets, we analytically characterized two possible equilibria under the ADA. When the costs from firing disabled workers and providing reasonable accommodations are high, firms have higher incentives to discriminate against workers based on health status. In this case, a Discriminatory Equilibrium arises, where disabled workers have lower job-finding rates and lower wages (compared to the pre-ADA equilibrium). On the other hand, if the costs from discriminatory hiring are high, firms find it optimal to pool all workers in a Non-Discriminatory Equilibrium, in which case disabled workers have higher job-finding rates and higher wages, at the expense of the non-disabled.

Then, we empirically studied the effects of the ADA on the labor market performances of the disabled, using the cross-state variation in employment protection laws prior to the ADA. Unlike previous empirical analyses that focus on stock variables such as employment, we explored new measures of labor market outcomes: labor market transition rates between employment and non-employment. We found that the ADA lead to a significant decline in transitions from employment to employment, without a significant reduction in transitions from non-employment to non-employment for the disabled. During the same time period, non-disabled workers did not experience a decline in employment-to-employment transition.

These empirical results are consistent with the predictions of the Discriminatory Equilibrium in our model. In particular, it seems that firms face a relatively low cost from preferentially hiring non-disabled workers. As a consequence, the current implementation of the ADA induces firms to discriminate against disabled workers at the hiring stage. Moreover, by focusing on the changes in worker flows, we are able to infer that under the ADA, firms face significant costs from firing disabled employees. According to our estimates, the change in the transition rates resulted in a reduction in the employment rate for disabled workers of 2.2 percentage points. Thus, we conclude that despite the government's intention, the ADA as it currently exists has not been an effective policy for improving the labor market conditions of disabled workers.

In this paper, we focused on understanding and evaluating the impact of the current employment protection policy in the United States. An important follow-up question is to investigate how we can better integrate disabled individuals into the labor market. According to our theoretical analysis, a Non-Discriminatory Equilibrium is more likely to arise when the productivity differences across health types are small. Thus, investment in education and health that enhances the productivity of disabled workers should be the long-term goal for the government. Moreover, effective prevention of hiring discrimination without imposing additional costs on the firms is essential for supporting disabled individuals in the labor market.[31] With the current demographic trends, we expect a further increase in the number of people with disabilities. Thus, the optimal design of labor market policies for the disabled and social insurance policies against disability risks are important topics of research, which we leave for future work.

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[31] The employment quota system implemented in many OECD countries (Austria, France, Germany, and Italy, to name a few) might be an alternative policy for achieving this goal. Among others, Lalive, Wuellrich and Zweimuller (2013) uses Austrian data to find that providing financial incentives for firms to employ disabled individuals has positive effects on the employment of disabled workers.

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[For Online Publication]

A Additional Empirical Analysis in Section 2

A.1 Aging Population and Trends in Disability

In the last two decades, the United States has experienced population aging, which could be the driving force behind the trends in the share of the disabled and labor market outflows due to poor health. As shown in Figure 4, the older population experiences higher rates of work limitations and labor market exits than their younger counterparts.

FIGURE 4
TRENDS IN DISABILITY OVER THE LIFE-CYCLE

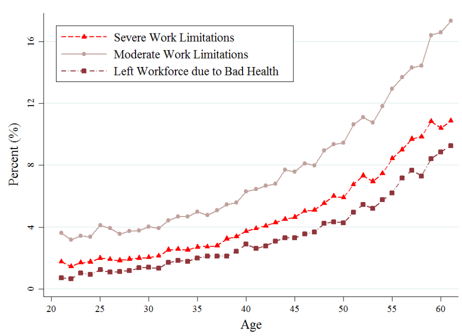
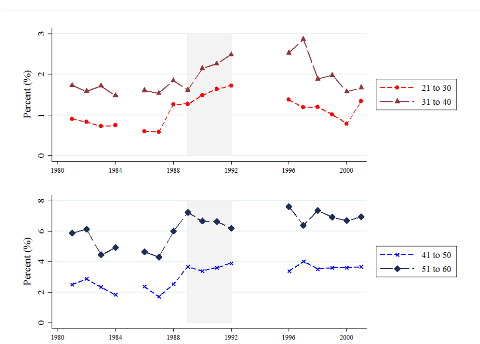


FIGURE 5
EXIT RATES DUE TO POOR HEALTH BY AGE GROUPS



Note: Figure 4 illustrates the average shares of individuals with disabilities and labor market exit rates by age. We computed the average of each age based on the March CPS from 1981 to 2001. These trends are weighted with the March supplement weight. Figure 5 computes the fraction of working-age individuals who left their jods due to poor health status by age group. Each age group is defined by a 10-year interval, starting at 21 and ending at 60. The average is weighted with the March supplement weight.

In order to control for the changes in demographic composition in explaining the trends shown in Figure 2, we compute the age-group specific statistics in the labor market exit rate for health-related reasons. If the increase in the labor force exit rates in the 1990s were the consequences of population aging, the within-age group exit rate must remain stable during the sample periods. Our results are reported in Figure 5. We observe a rise in exit rates from the labor market due to poor health for every age group in the late 1980s and early 1990s, suggesting that the increase in the aggregate trend cannot be explained by the compositional change alone. One might suspect that a potential reason for this change could be related to disability insurance. It is true that a more generous disability insurance program would encourage disabled workers to drop out of the labor force. However, the Social Security Disability Benefits Reform Act was passed in 1984, five years before the stark increase in the labor market exit rates in the end of the 1980s. Of course, we cannot conclude in the current stage that the passage of the ADA contributed to this trend. We explore this question in further detail using cross-state variation in Section 4.

A.2 Employment Rates by Health Statuses

FIGURE 6
TRENDS IN EMPLOYMENT RATES: THE DISABLED

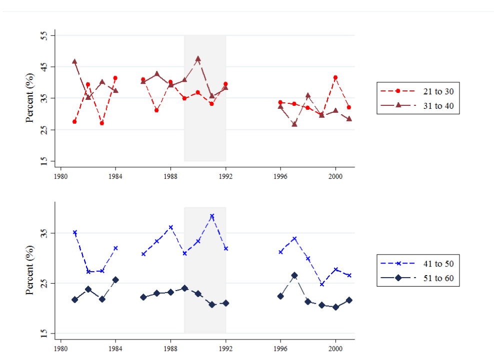
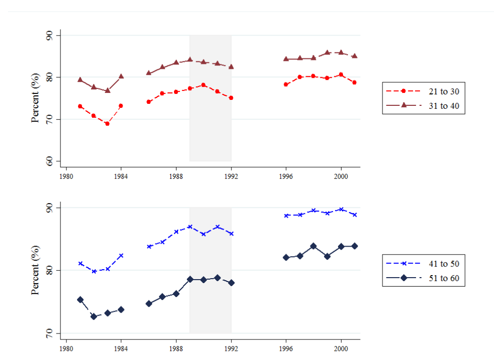


FIGURE 7
TRENDS IN EMPLOYMENT RATES: THE NON-DISABLED



Note: Figures 6 and 7 illustrate the trends of employment rates by health status and age. Each age group is defined by a 10-year interval, starting at 21 and ending at 60. Individuals are categorized as disabled if they report experiencing work limitations. These trends are weighted with the March supplement weight.

Figures 6 and 7 illustrate employment rate trends for different age groups. We verify that the long-run trend in employment rates of disabled individuals has been decreasing for all age groups, unlike that of non-disabled workers, who had steadily improving the employment rates during the same periods. We also confirm that employment rates are pro-cyclical for both groups. However, the employment rate is more volatile for the disabled compared to the non-disabled.

B Proofs of Lemmas and Propositions in Section 3

B.1 Competitive Search Equilibrium without the ADA

Proposition 12. (Labor Participation) *There exists a cutoff health status $\bar{i}$ such that $U_i > N_i$, $\forall i > \bar{i}$.*

Proof. Type-i workers opt out of the labor market if and only if $N_i \geq U_i$, or $\phi \geq \beta \max_w p\left(\theta_i\left(w\right)\right)\left[W_i\left(w\right) - N_i\right]$. It is obvious that if healthy workers do not participate in the labor market, then less healthy workers also opt out as

$$p\left(\theta_i\left(w_i^*\right)\right)\left[W_i\left(w_i^*\right) - N_i\right] > p\left(\theta_j\left(w_j^*\right)\right)\left[W_j\left(w_j^*\right) - N_j\right],$$

for $i > j$ as $w_i^* > w_j^*$ and $\theta_i\left(w_i^*\right) > \theta_j\left(w_j^*\right)$. □

Lemma 13. (Market Tightness) *If $y_i > y_j$, then $\theta_i\left(w\right) > \theta_j\left(w\right), \forall w \in [0, \infty)$.*

Proof. From the free-entry condition, we know

$$\kappa \quad \geq \quad q\left(\theta_i\left(w\right)\right)\left[\frac{y_i - w}{1 - \beta\left(1 - \delta\right)}\right]$$

as in the standard directed search model. For any active submarkets with $\theta_i\left(w\right) > 0$, we then have

$$\theta_i\left(w\right) \quad = \quad q^{-1}\left[\frac{\kappa\left\{1 - \beta\left(1 - \delta\right)\right\}}{y_i - w}\right]. \tag{15}$$

For any given wage rate w, $\theta_i\left(w\right)$ is increasing in y_i as $q^{-1}\left(\cdot\right)$ is monotonically decreasing. □

B.2 Equilibrium with the ADA

Participation Decisions of Workers under the ADA As noted in Proposition 12, type-i workers leave the labor market if $\phi \geq \beta \max_w p\left(\theta_i\left(w\right)\right)\left[W_i\left(w\right) - N\right]$. Let $\bar{\phi}_i^k \equiv \beta \max_w p\left(\theta_i^k\left(w_i^k\right)\right)\left[W_i\left(w_i^k\right) - N\right]$, where $i \in \{A, D\}$ denotes health status of workers and k denotes the type of equilibrium that arises, i.e., $k = CE$ if the ADA is not implemented and equals DE (Discriminatory Equilibrium) or NDE (Non-Discriminatory Equilibrium) depending on which equilibrium arises after the ADA. Then, workers leave the labor force if $\phi > \bar{\phi}_i^k$. The cut-off level of search cost that determines participation $\bar{\phi}_i$ is lower in the Discriminatory Equilibrium than it is under the competitive equilibrium for both types of workers as the value of employment is higher in CE, i.e., workers have less incentives to participate in the labor market in DE. On the other hand, in a NDE where $\hat{y}_{NDE} > y_D$, $\bar{\phi}_D^{NDE} > \bar{\phi}_D^{CE}$, whereas $\bar{\phi}_A^{NDE} < \bar{\phi}_A^{CE}$. Thus, if the labor market prospects are improved after the implementation of the ADA, workers' incentives to enter the market increase.

C Labor Market Characteristics by State-Level Employment Protection

In Section 4, we classified 50 states by the degree of employment protection for people with disabilities prior to the ADA. There are 14 states which implemented employment protection laws that were similar to the ADA in their requirements and scope, and we denote these states as having a "Strong" degree of employment protection. On the left panel of Figure 3, these 14 states are represented in dark blue. We classify 25 states that either had weak protection with full coverage or full protection with partial coverage as states with a "Moderate" degree of employment protection (light blue on the map). The 8 states with either similar protection with minimal coverage or weak protection with partial coverage have a "Weak" degree of employment protection (orange on the map). Lastly, those without any pre-ADA employment protections laws (3 states) are marked in red on the map in Figure 3.

Descriptive Statistics by the Degree of Employment Protection Based on this categorization, we report labor market characteristics and the time trends of the labor market variables before conducting our empirical analysis. Table 4 summarizes the demographic characteristics of states by these categories. Nearly one in three members of the US population resided in a state providing weaker employment protection for the disabled than the ADA, and 12% of the population was under significantly weaker protection compared to the ADA. Approximately one in every 10 members of the working-age population in these states reported health problems causing work limitations.

TABLE 4
DESCRIPTIVE STATISTICS OF STATES BY THE DEGREE OF EMPLOYMENT PROTECTION

	Degree of Employment Protection			
(%)	No Policy	Weak	Moderate	Strong
Population share	3.7	8.5	64.1	23.8
Population share with disabilities	11.4	9.7	8.3	8.7
College or more	26.3	32.6	34.5	33.1
Non-white	51.9	50.0	50.0	50.2

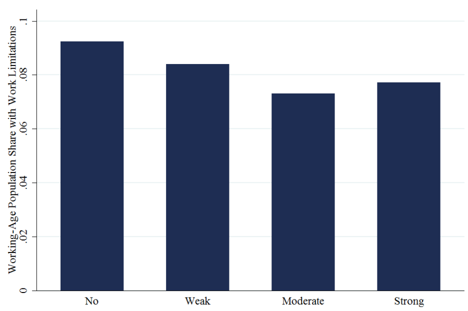
Note: Table 4 summarizes the demographic characteristics of states by the degree of state-level employment protection for disabled workers. The population share is out of the entire US working-age population. The population share with disabilities is computed within the working age from 21 to 60. All numbers are given as percentages and weighted with the March supplement weight.

TABLE 5
THE DEGREE OF STATE-LEVEL EMPLOYMENT PROTECTION LAWS

I. Similarity: ADA-like state laws pre-existed		
Full Protection	Weak Protection	No Protection
Arizona, Colorado, Delaware, Idaho, Iowa, Louisiana, Massachusetts, Minnesota, New Mexico, North Carolina, Oregon, Pennsylvania, Rhode Island, Vermont, Virginia, Washington, Wisconsin, Wyoming	Alaska, California, Connecticut, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Kentucky, Maine, Maryland, Michigan, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Utah, West Virginia	Alabama, Arkansas, Mississippi

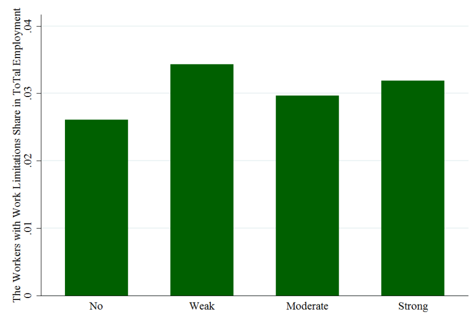
II. Scope: Inclusion of private employers and mental disabilities		
Private and Mental	Private or Mental	Only Public and Physical
California, Connecticut, Georgia, Illinois, Indiana, Iowa, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming	Alaska, Arizona, Colorado, Florida, Hawaii, Kansas, Kentucky, Nevada	Alabama, Arkansas, Delaware Idaho, Mississippi

FIGURE 8
THE SHARE OF THE DISABLED
IN THE WORKING-AGE POPULATION



Degree of Employment Protection

FIGURE 9
THE SHARE OF THE DISABLED
IN TOTAL EMPLOYED POPULATION



Degree of Employment Protection

Note: Figures 8 and 9 compare the share of disabled individuals in the working-age population and in the total employed population by the degree of protection given by state-level employment protection laws. The working-age population is defined as those aged 21 to 60. We define a respondent as disabled if he experienced work limitations at least once in his sampling periods. Statistics are computed from the March CPS from 1981 to 1990, wieghted with the March supplement weight.

Labor Market Outcomes Prior to the ADA by the Degree of Employment Protection Now we turn to labor market statistics and compare the performances of disabled workers in labor markets by the level of employment protection. Figures 8 and 9 illustrate the share of disabled individuals in the working-age population and their proportion in the state's total employed population, respectively. If the degree of employment protection is independent from the performances of the disabled workers in labor markets, all else being equal, we would observe a monotonic increase: states with a higher share of disabled individuals in the population would record a higher share of disabled employment. The results suggest no clear linear relation between these two variables.

Table 6 compares the labor market outcomes by health status prior to the passage of the ADA in 1990. For individuals with no work limitation, we do not observe significant differences in labor market outcomes across different state categories. For individuals with work limitations, however, we observe a monotonic relationship between labor market outcomes and the degree of employment protection. The labor market participation rates rise with the degree of employment protection. Simultaneously, the employment rate of the disabled also increases when states provide stronger protection for the disabled.

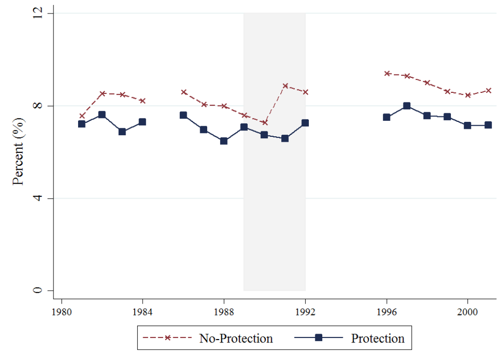
TABLE 6
LABOR MARKET STATISTICS OF INDIVIDUALS WITH DISABILITIES

	Non-Disabled				Disabled			
	Degree of Employment Protection				Degree of Employment Protection			
Rate (%)	No Policy	Weak	Moderate	Strong	No Policy	Weak	Moderate	Strong
Employment	85.2	86.6	86.7	86.5	21.0	29.4	30.3	31.5
Unemployment	5.4	4.3	5.5	5.4	3.1	3.7	4.6	4.7
Non-participation	9.4	9.1	8.1	8.1	75.8	66.9	65.1	63.8

Note: Table 6 compares the labor market statistics of male workers aged between 21 to 60 using the matched March CPS data from 1981 to 1990. We define a respondent to be disabled if he experienced work limitations at least once in his sampling periods. Severely disabled individuals are those who experienced work limitations for two consecutive years. Statistics are computed using the March supplement weight. Numbers are written in percentages.

Trends of Labor Market Outcomes by the Degree of Employment Protection Finally, we report the evolution of labor market statistics before and after the ADA by the degree of employment protection. We categorize states into two groups: 11 "*no protection*" states (Weak or No Policy) and 39 "*protection*" states (Moderate or Strong) based on the classification in Figure 3. First, Figure 10 shows the share of the working-age population with work limitations from 1980 to 2000. As seen in Table 4, states with weaker employment protection laws have a higher share of disabled in the working-age population throughout the entire sample period. This result confirms that there was no significant demographic change across state borders around the legislation of the ADA.

FIGURE 10
THE SHARE OF THE WORKING-AGE POPULATION WITH WORK LIMITATIONS



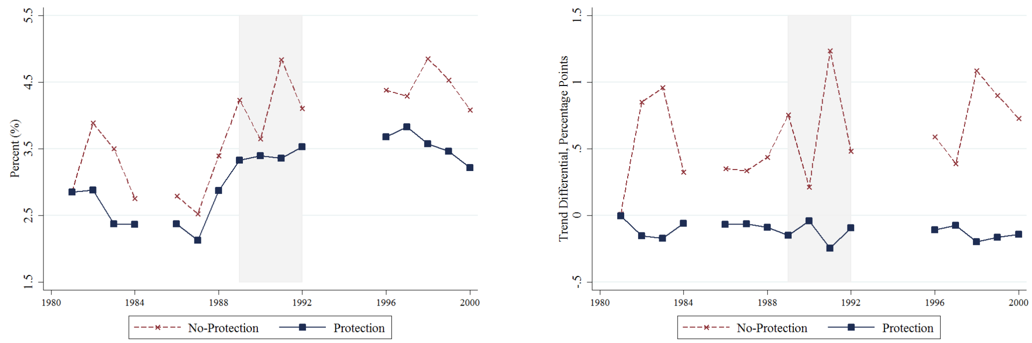
Note: Figure 10 illustrates the fraction of the working-age population with work limitations. The working-age population is defined as those between the ages of 21 and 60. The trends are weighted by the March supplement weight.

Now, we compute the trends of labor market performances of the disabled workers by these two groups of states. The first measure of labor market performance is the fraction of recent labor market drop-outs citing poor health status as a major factor in their exits. Figure 11 reports the trends of this variable by the degree of employment protection. To ease the comparison between the two groups, we also compare the trend after de-trending with the national average. Overall, the disabled have worse labor market outcomes in states with no protection. Their labor market exit rates are higher than the national average. We also note from this figure that the difference in labor market exit rates between the two groups rose during the late 1980s to early 1990s.

Another measure of the labor market performance of the disabled is their employment rate. Figure 12 illustrates the trends of the employment rates of the working-age individuals with disabilities by the degree of employment protection. When we de-trend the employment using the aggregate mean, we find a diverging trend in the difference in employment rates during the late 1980s and early 1990s. The increase in this difference in employment was driven by the decrease in the employment rate of disabled workers in states with no pre-existing employment protection.

Figure 11
Labor Market Exit Rates due to Poor Health by the Degree of Employment Protection

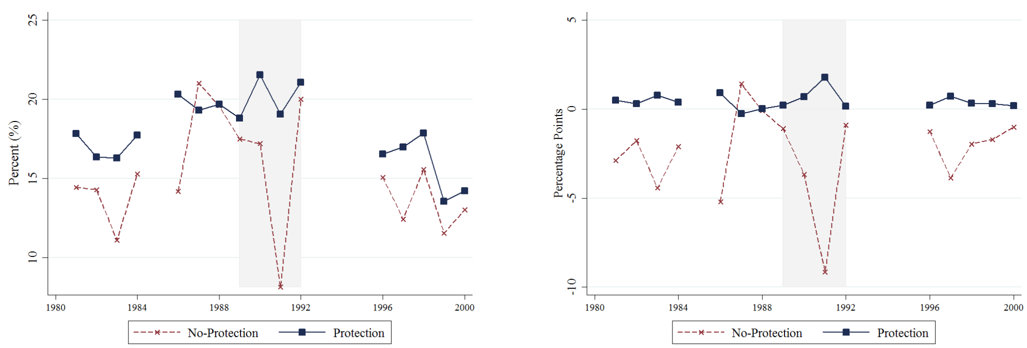
(A) Level (B) Difference



Note: Figure 11 illustrates the trends of individuals in the working-age population who cited poor health as the main cause of quitting or retirement by the degree of employment protection. The red dashed line denotes the state-average with weak employment protections, and the blue solid line with square markers denotes the state-average with strong employment protection. Both trends are weighted with the March CPS supplement weight. The difference is computed by subtracting the national average from the trend.

Figure 12
Employment Rates of the Disabled by the Degree of Employment Protection

(A) Level (B) Difference



Note: Figure 12 illustrates the trends of the employment rates of disabled individuals in the working-age population between 21 and 60 by the degree of employment protection. The red dashed line denotes the state-average with weak employment protections, and the blue solid line with square markers denotes the state-average with strong employment protection. Both trends are weighted with the March CPS supplement weight. The difference is computed by subtracting the national average from the trend.

D Additional Tables

D.1 Tables for Probit Analysis in Section 2

TABLE 7
ROLE OF HEALTH IN TRANSITION PROBABILITIES

t	Employment		Non-Employment	
$t+1$	Employment		Non-Employment	
Disability	-0.902^{***}	-0.902^{***}	1.220^{***}	1.220^{***}
	[-0.96,-0.84]	[-0.96,-0.85]	[1.17,1.27]	[1.17,1.27]
Female	-0.256^{***}	-0.256^{***}	0.580^{***}	0.580^{***}
	[–0.27,-0.24]	[–0.27,-0.24]	[0.56,0.60]	[0.55,0.61]
White	0.103^{***}	0.103^{***}	-0.017	-0.017
	[0.07,0.13]	[0.08,0.13]	[-0.06,0.03]	[-0.05,0.02]
College	0.224^{***}	0.224^{***}	-0.106^{***}	-0.106^{***}
	[0.20,0.25]	[0.20,0.24]	[-0.15,-0.06]	[-0.14,-0.08]
Age	0.111^{***}	0.111^{***}	-0.055^{***}	-0.055^{***}
	[0.11,0.12]	[0.11,0.12]	[-0.07,-0.05]	[-0.06,-0.05]
Age^2	-0.001^{***}	-0.001^{***}	0.001^{***}	0.001^{***}
	[-0.001,-0.001]	[-0.001,-0.001]	[0.0008,0.001]	[0.0008,0.001]
adj. R-squared	0.0426	0.0426	0.1195	0.1195
	cluster	robust s.e	cluster	robust s.e
Number of obs.	319,548		90,363	

Note: Table 7 shows the probit regression coefficients based on the March CPS data from 1981 to 2014 using the March supplement weight. These estimations also include year-fixed effects, state-fixed effects, and state-specific linear time trends. Numbers in brackets are at a 95% confidence interval based on robust standard errors. *** $p < 1\%$, ** $p < 5\%$, and * $p < 10\%$.

TABLE 8
ROLE OF HEALTH IN LABOR MARKET TRANSITION PROBABILITIES: INCLUDING TIME TREND DUMMIES

t	Employment		Non-Employment	
$t+1$	Employment		Non-Employment	
Disability	-0.900^{***}	-0.900^{***}	1.226^{***}	1.226^{***}
	[-0.96,-0.84]	[-0.95,-0.85]	[1.17,1.28]	[1.18,1.27]
Disability	-0.070^{***}	-0.070^{***}	0.078^{***}	0.078^{***}
$\times [t \geq 1990]$	[-0.11,-0.03]	[-0.10,-0.04]	[0.03,0.13]	[0.03,0.13]
Female	-0.256^{***}	-0.256^{***}	0.580^{***}	0.580^{***}
	[–0.27,-0.24]	[–0.27,-0.24]	[0.56,0.60]	[0.55,0.61]
White	0.093^{***}	0.094^{***}	0.017	0.017
	[0.07,0.12]	[0.08,0.11]	[-0.02,0.05]	[-0.01,0.04]
College	0.191^{***}	0.191^{***}	-0.086^{***}	-0.086^{***}
	[0.17,0.21]	[0.17,0.21]	[-0.12,-0.06]	[-0.11,-0.06]
Age	0.112^{***}	0.112^{***}	-0.056^{***}	-0.056^{***}
	[0.11,0.12]	[0.11,0.12]	[-0.07,-0.05]	[-0.06,-0.05]
Age^2	-0.001^{***}	-0.001^{***}	0.001^{***}	0.001^{***}
	[-0.001,-0.001]	[-0.001,-0.001]	[0.0008,0.001]	[0.0008,0.001]
adj. R-squared	0.0397	0.0397	0.1189	0.1189
	cluster	robust s.e	cluster	robust s.e
Number of obs.	319,548		90,363	

Note: Table 8 shows the probit regression coefficients based on the March CPS data from 1981 to 2000 using the March supplement weight. These estimations also include state-fixed effects and state-specific linear time trends. Numbers in brackets are at a 95% confidence interval based on robust standard errors. *** $p < 1\%$, ** $p < 5\%$, and * $p < 10\%$.

D.2 Tables for the DD Analysis in Section 4

TABLE 9
COEFFICIENTS ESTIMATION RESULTS

	Status in time t		Status in time t	
	Employment		Non-Employment	
Status in time $t+1$	Employment	Non-Employment	Employment	Non-Employment
Non-Disabled	0.601***	0.399***	0.319***	0.678***
	[0.58,0.62]	[0.38,0.42]	[0.27, 0.37]	[0.63, 0.72]
Non-Disabled	0.002	-0.002	-0.025***	0.025***
in No-Protection	[-0.001,0.004]	[-0.004,0.001]	[-0.04, -0.01]	[0.01, 0.04]
Non-Disabled $\times$ Post-ADA	0.004**	-0.004**	-0.039***	-0.039***
	[0.002,0.007]	[-0.007,-0.002]	[-0.05,-0.03]	[-0.05,-0.03]
Non-Disabled	-0.002	0.002	-0.009	0.009
in No-Protection $\times$ Post-ADA	[-0.01,0.002]	[-0.002,0.006]	[-0.03,0.02]	[-0.017,0.04]
Disabled	-0.206***	0.206***	-0.203***	0.203***
	[-0.23,-0.18]	[0.18,0.23]	[-0.21,0.19]	[0.19,0.21]
Disabled in No-Protection	-0.007	0.007	-0.041***	0.042***
	[-0.07,0.05]	[-0.05,0.07]	[-0.06,0.03]	[0.03,0.06]
Disabled $\times$ Post-ADA	0.006	-0.006	-0.013**	0.013**
	[-0.04,0.05]	[-0.05,0.04]	[-0.02, -0.004]	[0.004, 0.02]
Disabled in No-Protection	-0.058**	0.058**	-0.003	0.003
$\times$ Post-ADA	[-0.11,-0.004]	[0.004,0.11]	[-0.02,0.01]	[-0.01,0.02]
Female	-0.032***	0.032***	-0.167***	0.167***
	[-0.04,-0.03]	[0.03,0.04]	[-0.17, -0.16]	[0.16, 0.17]
White	0.016***	-0.016***	0.005	-0.004
	[0.01,0.02]	[-0.02,-0.01]	[0.01, 0.01]	[-0.01, 0.01]
College	0.022***	-0.022***	0.021***	-0.021***
	[0.02,0.02]	[-0.02,-0.02]	[0.01, 0.03]	[-0.03, -0.01]
Age	0.017***	-0.017***	0.009***	-0.009***
	[0.01,0.02]	[-0.018,-0.016]	[0.007, 0.01]	[-0.01, -0.007]
Age^2	-0.0001***	0.0001***	-0.00018***	0.00018***
	[-0.0002,-0.00018]	[0.00018,0.0002]	[-0.0002, -0.0001]	[0.0001, 0.0002]
adj. R-squared	0.0237	0.0238	0.1072	0.1075
Number of obs.	299,319	299,319	85,723	85,723

Note: Table 9 reports the coefficient estimates of the empirical model. The first row is the estimated control mean. The other rows are the estimated difference between the control and treatment. Numbers in brackets are at a 95% confidence interval based on robust standard errors; *** $p < 1\%$, ** $p < 5\%$, and * $p < 10\%$.

D.3 Tables for the DD Analysis using the Aggregated Data

We first run individual-level regression using age, education, race, and gender and construct the residual variable, $e_{i,s,t}$, that is not explained by idiosyncratic characteristics. We aggregate this residual in state-level before and after the ADA and conduct DD analysis in state-level variable:

$$\begin{aligned} & \bar{e}_{s,t+1} \\ = \quad & \alpha_s + \mathbb{I}_{\{\text{Disabled}\}} \left\{ \beta_0^D + \beta_1^D \mathbb{I}_{\{\text{No Protect}\}} + \beta_2^D \mathbb{I}_{\{\text{t>90}\}} + \beta_3^D \mathbb{I}_{\{\text{t>90}\}} \mathbb{I}_{\{\text{No Protect}\}} \right\} \\ & + \mathbb{I}_{\{\text{Non-Disabled}\}} \left\{ \beta_0^{ND} + \beta_1^{ND} \mathbb{I}_{\{\text{No Protect}\}} + \beta_2^{ND} \mathbb{I}_{\{\text{t>90}\}} + \beta_3^{ND} \mathbb{I}_{\{\text{t>90}\}} \mathbb{I}_{\{\text{No Protect}\}} \right\} + \epsilon_{s,t}. \end{aligned}$$

TABLE 10
COEFFICIENTS ESTIMATION RESULTS

	Status in time t	Status in time t
	Employment	Non-Employment
Status in time $t+1$	Employment	Non-Employment
Disabled	-0.0006^{**}	0.0003
	(0.0002)	(0.0003)
Disabled in No-Protection	0.0011	0.0418^{***}
	(0.0009)	(0.0023)
Disabled × Post-ADA	0.0026^{**}	-0.0082^{***}
	(0.0010)	(0.0022)
Disabled in No-Protection	-0.0033^{**}	0.0086^{**}
× Post-ADA	(0.0015)	(0.0041)
Non-Disabled in No-Protection	0.0002	0.0418^{***}
	(0.0010)	(0.0020)
Non-Disabled × Post-ADA	0.0017	-0.0081^{***}
	(0.0010)	(0.0021)
Non-Disabled in No-Protection	-0.002	0.0092^{**}
× Post-ADA	(0.0017)	(0.0040)
adj. R-squared	0.6009	0.5646
Number of obs.	50	50

Note: Table 10 reports the coefficient estimates of the empirical model based on the state-level series of labor market statistics. The first row is the estimated control mean. The other rows are the estimated differences between the control and treatment. Numbers in brackets are robust standard errors; *** $p < 1\%$, ** $p < 5\%$, and * $p < 10\%$.