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The Effect of the Americans with Disabilities Act on Social Security Disability Insurance

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The Effect of the Americans with Disabilities Act on Social Security Disability Insurance

Abstract

The Americans with Disabilities Act (ADA) was passed in 1990 and implemented in 1992 with the goal of providing disabled workers with employment protections and workplace accommodations. A number of studies have examined the ADA's impact on disabled individuals' employment. Some prominent studies find that employment decreased as a result of the ADA, as employers faced extra responsibilities and costs when hiring disabled workers. It is important to also understand the ADA's impact on Social Security Disability Insurance (SSDI), the key social insurance program for disabled workers. I investigate this using state and county data on SSDI outcomes and a range of complementary demographic and economic characteristics data. After the ADA's passage, there is evidence of an increase in SSDI applications, although there is little direct evidence that these higher applications result in more SSDI allowances. The number of SSDI beneficiaries increases slightly over time, suggesting that the ADA may have led to some combination of higher allowances and lower terminations. All of these effects are concentrated in states without employment protections prior to the ADA, as opposed to states with protections but no disability accommodations. The results suggest that the ADA may have affected SSDI outcomes, and that it is important to further understand the interaction between disability-related employment law and federal disability programs.

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1. Introduction

The Americans with Disabilities Act (ADA) prohibits discrimination on the basis of disability. Passed in July 1990, with the employment provisions implemented in July 1992, it extends employment protections to disabled workers in terms of hiring, termination, and wage decisions. These protections are similar to those provided on the basis of sex, race, and other characteristics by earlier civil rights legislation. The ADA also requires employers to provide reasonable accommodations to disabled job applicants and employees so that they can perform their jobs.

Several studies have examined the employment ADA's effects. Deleire (2000) and Acemoglu and Angrist (2001) find that the ADA decreased the employment of disabled workers. Both papers use survey data to compare the changes in employment trends of disabled and nondisabled people after ADA' the introduction of the. Acemoglu and Angrist (2001) also exploit state-level variation in charge rates after the ADA's introduction. Deleire (2000) used the Survey of Income and Program Participation (SIPP) and Acemoglu and Angrist used the Current Population Survey (CPS). The authors argue that the ADA affected the incentives to hire disabled workers and limited their work options.

Subsequent research has raised doubts about this conclusion. Hotchkiss (2004) uses the CPS and SIPP to replicate the findings of both studies. She argues that the apparent decline in the labor force participation among the disabled is likely to result from changes in the definitions of disabled individuals, rather than because the ADA caused them to leave the labor force. Houtenville and Burkhauser (2004) use the CPS and a different definition of disability than Acemoglu and Angrist (2001). They find that

the employment decline among the disabled occurred well before the ADA's introduction. Jolls and Prescott (2004) exploit state variation in antidiscrimination laws to separately examine the effects of workplace accommodations for disabled workers and antidiscrimination provisions. They find similar employment effects in the states affected by the accommodations by themselves and the states affected by both protections and accommodations, suggesting that accommodation requirements are the main source of disabled workers' employment decrease. These effects were present for a short period of time. Recently, Armour et al. (2018) examine the employment effects of the ADA Amendments Act of 2008, which expanded the ADA's definition of disability. They find that it increased the hiring of some types of disabled workers.

These studies have only examined the impacts of Social Security Disability Insurance (SSDI) and other federal disability programs in passing. For example, Jolls and Prescott (2004) look at SSDI applications between 1990 and 1993, with only limited attention given to the similarity of SSDI application rates across treated and comparison states in earlier years. They find imprecise increases, although the presented results comprise approximately one-quarter of one table in their paper and deserve further investigation.

In this paper, I examine how the ADA affected the number of SSDI applications, allowances, and beneficiaries. Understanding the impacts on SSDI is important in its own right, given the size of the program and its sizeable growth through the 1990s. It is also informative about the ADA's impacts on the labor market. SSDI eligibility rules were nationally consistent around the time the ADA was introduced, so SSDI outcomes

should not have suffered from the same definitional issues that seem to complicate the analysis using survey data.

I undertake two complementary approaches to examining the ADA's effects on SSDI outcomes. First, I use state-level data to follow the most common approach in previous studies: estimating the ADA's effects in a differences-in-differences specification by comparing the outcomes in states affected by the ADA rules ("treated" states) to states unaffected because they already had legislation in place that provided disability protections or accommodations that were equivalent or higher than the ADA ("comparison" states). Figure 1 shows a map of the states treated by the ADA and those that were not. It also shows the variation across treated states in how they were affected by workplace accommodations and antidiscrimination protections.

The second approach uses the county-level data to more finely control for local labor market characteristics. It follows a similar difference-in-differences design to the one just described, but now compares counties on state borders in a "treated" state to neighboring counties in "control" states. The approach is similar to a method used by Dube et al. (2010), who use county pairings across state borders that share similar characteristics and labor market trends, but differ in state minimum wage policies, to assess the effects of minimum wage.

Several data sources are used that span 1980 to 1998. State-level data on the number of SSDI applications and allowances come from Autor and Duggan (2003), while state- and county-level data on the number of SSDI beneficiaries come from the long-standing annual SSA publication, "OASDI Beneficiaries by State and County" (Moore 2020). Other data on population numbers, demographics and economic

characteristics from the Current Population Survey and a compilation of Census Intercensal Population Estimates by the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program.

After the ADA's passage, there is evidence of an increase in SSDI applications in treated states, although there is little direct evidence that these higher applications result in more SSDI allowances. The number of SSDI beneficiaries increases slightly over time, suggesting that the ADA affected some combination of higher allowances and lower terminations. The county-level analysis also points to potentially higher SSDI rates, although the lack of employment controls appear to make it harder to control for pre-existing differences in SSDI beneficiary rates across treated and comparison states.

In addition to estimating the ADA's overall effects, it is also interesting to estimate if the effects differ by the type of impacts. Following Jolls and Prescott's (2004) analysis of the ADA's employment effects, I separately analyze the effects on SSDI outcomes in (1) states that had neither disability employment protections nor accommodations prior to the ADA, and (2) states that had disability employment protections but not regulations around providing workplace accommodations for disabled workers. As discussed already, the distribution of the different types of states are shown in Figure 1. The results suggest that all of the effects are concentrated in states that had no employment protections or accommodations prior to the ADA, as opposed to states with protections but no disability accommodations.

Overall, the results suggest that the ADA may have affected key SSDI outcomes, and that it did so by increasing the protections provided to disabled workers. The estimated increases are generally around 5% to 10% in the years immediately after the

ADA's introduction. These results demonstrate that it is important to further understand the overall effects on federal disability outcomes.

The motivation behind legislating for disabled workers to have employment protections and accommodations is that it will increase their employment and earnings. It is important to understand the impact of this support on their need for social insurance, as it helps both to understand how the use of SSDI changes over time and why SSDI rates vary across states. It also helps to better understand how the ADA affected the disabled people's work activities, as the consistency and accuracy of the SSDI administrative data in this project helps inform the broader literature on the ADA's effects. The current findings suggest that the effects found for disabled workers' employment declines in some studies may also be present in terms of their SSDI use. A planned future project will examine the ADA's effects on the Supplemental Security Income (SSI) program, which should shed further light on this issue as it protects individuals with marginal work histories.

2. Empirical approach

Complementary approaches are taken to estimating the ADA's effects on SSDI outcomes. Both use a differences-in-differences approach, where states treated by the ADA are compared to states that are unaffected by the federal legislation. One approach uses state-level data, which allows a substantial number of time-varying socioeconomic controls to be added to the regression to account for other factors that may affect SSDI outcomes around the time of the ADA's introduction.

Another set of analysis is done with county-level data, and follows papers that have used adjacent counties that span state borders to estimate \ minimum wage laws'

effects on employment. Fewer covariates are available at the county level, but the finer geographic detail allows for the introduction of location-by-year fixed effects that flexibly control for characteristics specific to local areas, such as local labor markets.

2.1 State-level analysis

The state-level analysis uses differences-in-differences specifications. In all cases, the comparison sample consists of states that already had "ADA-like" disability employment protections and accommodations. Even though the federal ADA law applied to these states, it had no practical effect as employers were already subject to regulations similar to or more stringent than what was being implemented.

The ADA's overall impact is estimated using all other states in the treatment sample. Employers in these states experienced some change in disability employment laws after the ADA's introduction. One regression specification estimates the differences between treatment and comparison states in each year, relative to a reference year that is just before the ADA's implementation. It is as follows:

$$y_{st} = \alpha_s + \theta_t + X_{st}\lambda + \sum_{\substack{t=1980 \\ t\neq 1988}}^{1998} D_t * Treated_s \beta^t + u_{st} \quad (1)$$

In this specification, y_{st} is the SSDI outcome in a given state *s* and year *t*. The outcomes examined are the rates of SSDI applications, allowances, and beneficiaries per working-age population (i.e., ages 18 to 64 years). On the right-hand side, α_s represents a complete set of state fixed effects that controls for permanent differences in SSDI outcomes across states; θ_t is a complete set of time fixed effects that captures common time trends in SSDI outcomes; and X_{st} represents time-varying, state-level factors that might affect SSDI activity, such as changes in demographic characteristics and economic activity. The specific covariates are described along with the results, and

I consider the sensitivity of the results to the inclusion of different controls. The variable $Treated_s$ is a dummy variable equal to one if the state did not have ADA-like regulations, and zero otherwise. Time-varying differences between treated and comparison states are identified by the interaction of $Treated_s$ with the time dummy variables, D_t, which are equal to one in year t and zero otherwise.

As shown in the equation and discussed below, we generally use data for 1980 to 1998. The reference year is 1988, which is the year before any ADA-related legislation was passed.[1] The coefficients of interest β^t come from the interaction of the treatment identifier and the year dummy variables, and measure the annual differences in SSDI outcome variables for treated and control states relative to the reference year. I estimate standard errors allowing for heteroskedasticity and an arbitrary correlation in errors at the state level. This and subsequent specifications are weighted by the working-age population in each state in each year.

Equation (1) enables me to flexibly compare treated states to comparison states to assess the ADA's effects. There are several years of data before the ADA's introduction, which provides an opportunity to assess whether the states in the two samples are comparable in terms of SSDI outcomes before the act's introduction.

One concern is that estimates for individual years may be imprecise. To address that concern, I also use a difference-in-differences specification that groups years together:

[1] The Senate passed the ADA in 1989. It was passed in the House and signed into law by President George H.W. Bush in 1990. See https://adata.org/ada-timeline [Last accessed: September 24, 2021].

$$y_{st} = \alpha_s + \theta_t + X_{st}\lambda + \sum_{\substack{t=1980,82-83 \\ t\neq 1987-89}}^{1996-98} P_t * Treated_s \beta_P^t + u_{st} \quad (2)$$

The time dummy variables, P_t, represent periods spanning three years. The first period is 1980 to 1983; as described below, this uses three years of data as the 1981 data is missing for all of the SSDI outcomes. The other pre-ADA period estimated spans 1984 to 1986. These are estimated relative to years 1987 to 1989, as are all of the post-ADA effects. The next period, spanning 1990 to 1992, estimates the effects during a period when the ADA was passed (in July 1990) and when it was implemented (in July 1992). The other two periods, 1993 to 1995 and 1996 to 1998, measure the ADA's effects after its implementation. Aside from grouping the estimated effects to increase precision, all other regression elements remain the same.

In addition to estimating the ADA's overall effects, it is also interesting to estimate if the effects differ by the type of impacts. Following Jolls and Prescott's (2004) analysis of the employment effects of the ADA, I separately analyze the effects in (1) states that had neither disability employment protections nor accommodations prior to the ADA, and (2) states that had disability employment protections but not regulations around providing workplace accommodations for disabled workers. To estimate these effects, Equation (1) is adapted to be the following:

$$y_{st} = \alpha_s + \theta_t + X_{st}\lambda + \sum_{\substack{t=1980 \\ t\neq 1988}}^{1998} D_t * Tr\_Full_s \beta_F^t + \sum_{\substack{t=1980 \\ t\neq 1988}}^{1998} D_t * Tr\_Accom_s \beta_A^t + u_{st} \quad (3)$$

The dummy variable Tr_Full_s is equal to one if the state did not have ADA-like protections or accommodations, and zero otherwise. The β_F^t coefficients measure the annual differences in SSDI outcome variables for these states relative to states that had "ADA-like" regulations. Likewise, the dummy variable Tr_Accom_s is equal to one if the state only did not have ADA-like accommodations, and zero otherwise. The β_A^t

coefficients measure the annual differences in SSDI outcome variables for states affected by the ADA accommodations regulations relative to states that had "ADA-like" regulations. Other covariates are specified at the state level and, therefore, remain the same as in Equation (1).

The treated states can also be split in the specification where states are grouped in three-year periods, as follows:

$$y_{st} = \alpha_s + \theta_t + X_{st}\lambda + \sum_{\substack{t=1980-83 \\ t\neq 1987-89}}^{1996-98} P_t * Tr\_Full_s\beta_{PF}^t + \sum_{\substack{t=1980-83 \\ t\neq 1987-89}}^{1996-98} P_t * Tr\_Accom_s\beta_{PA}^t + u_{st} \quad (4)$$

where the new dummy variables identifying the states affected by the ADA in different ways match the description for Equation (3).

These different equations enable the ADA's effects to be estimated using available state-level data. In combination, they provide different information about the magnitude and precision of any changes after the ADA, when the changes occur, and what parts of the ADA legislation may account for such changes.

2.2 County-level analysis

The state-level specifications allow for the inclusion of state fixed effects and time fixed effects, but time-varying, location-based fixed effects are difficult to implement without soaking up all of the variation in the data (e.g., state-by-year fixed effects) or using large geographic regions that do not control for local labor factors (e.g., region-by-year fixed effects using the four census regions: Northeast, Midwest, West and South). Despite time-varying covariates in the state-level data, it is possible that unobserved factors bias the estimates.

County-level data provides the opportunity to implement an identification strategy that helps to address these concerns. The approach is to focus on counties that lie on a

state border, and to compare counties in states whose disability employment conditions are affected by the ADA to adjacent counties that are not. It exploits that the treatment of changing disability employment rules is applied to only parts of a common local labor market. This identification strategy was adopted by Dube et al. (2010) when examining the employment effects of minimum-wage laws on earnings and employment in restaurants and other low-wage sectors, and is in the spirit of early research on minimum wages that examined employment effects close to state borders (Card and Krueger 1994). County pairs that span state borders have also been used to examine other questions, including the political and economic effects of the Black citizens' disenfranchisement in the South (Naidu 2012); the minimum-wage laws' effects on employment flows (Dube et al. 2016); the employment effects of unemployment insurance generosity (Boone et al. 2021); and the effects of Medicaid expansions on crime (He and Barkowski 2020).

This empirical approach is implemented as follows:

$$y_{cpt} = \alpha_c + \theta_{pt} + X_{ct}\lambda + \sum_{\substack{t=1980 \\ t \neq 1988}}^{1998} D_t * Treated_c \beta^t + u_{cpt} \quad (5)$$

where *c* indexes counties, *t* still indexes years, and *p* indexes pairs of contiguous counties spanning state borders. The SSDI beneficiary rate is given by y_{cpt}. On the right-hand side, α_c represents a complete set of county fixed effects controlling for permanent differences in SSDI outcomes across counties and θ_{pt} represents a complete set of pair-time fixed effects. The ability to include the latter set of fixed effects is the major advantage of this approach, as they account for common shocks happening at the annual level to local sets of counties.

The term X_{ct} represents time-varying county-level factors that might affect SSDI activity, such as changes in demographic characteristics. The specific covariates are described along with the results, and I consider the sensitivity of the results to the inclusion of controls. The variable $Treated_s$ is a dummy variable equal to one if the county is in a state without ADA-like regulations, and zero otherwise. Time-varying differences between counties in treated and comparison states are identified by the interaction of $Treated_c$ with the time dummy variables D_t, which are equal to one in year t and zero otherwise. As with the state-level analysis, the data are for 1980 to 1998 and the reference year is 1988. This and subsequent regressions are weighted by the working-age population in each county in each year.

The coefficients of interest, β^t, come from the interaction of the treatment identifier and the year dummy variables, and measure the annual differences in SSDI outcome variables for treated and control counties relative to the reference year. I estimate standard errors allowing for heteroskedasticity and an arbitrary correlation in errors at the border-pair level; the latter decision addresses the potential for a mechanical correlation across county-pairs, and potentially along entire segments of state borders (Dube et al. 2010).

There are a few things to note about the construction of this analysis' sample . First, only a subset of counties are on state borders. In this setting, after implementing merges to create consistent county borders over time, there are 1,108 counties included in the border-county analysis. Second, some counties are contiguous to multiple counties in another state (or, in a small number of cases, states). The data is created at the county-pair-year level, which means that if a county is adjacent to two cross-border

counties then it appears twice in the data, with a different border pair identifier in the second instance. To ensure that counties are given equal weight in the analysis, the regressions are weighted by the inverse of the number of pairings it has with cross-border counties. The median number of pairings is two, and the maximum is seven.

As with the state-level analysis, the analysis varies in terms of the time periods over which the effects are estimated and whether a distinction is made between states affected by the ADA both in terms of disability employment protections and disability employment accommodations, and states only affected in terms of accommodations.

To increase precision, the county-level specification groups years together in a way similar to Equation (2):

$$y_{cpt} = \alpha_c + \theta_{pt} + X_{ct}\lambda + \sum_{\substack{t=1980,82-83 \\ t\neq 1987-89}}^{1996-98} P_t * Treated_c \beta_P^t + u_{cpt} \quad (6)$$

The time dummy variables, P_t, span the same time periods as before, and the regression is otherwise the same as Equation (5).

The regressions are adjusted to allow the effects to differ across states based on the type of treatment. This is also similar to the state-level approach shown in Equations (3) and (4):

$$y_{cpt} = \alpha_c + \theta_{pt} + X_{ct}\lambda + \sum_{\substack{t=1980 \\ t\neq 1988}}^{1998} D_t * Tr\_Full_c \beta_F^t + \sum_{\substack{t=1980 \\ t\neq 1988}}^{1998} D_t * Tr\_Accom_c \beta_A^t + u_{cpt} \quad (7)$$

$$y_{cpt} = \alpha_c + \theta_{pt} + X_{ct}\lambda + \sum_{\substack{t=1980-83 \\ t\neq 1987-89}}^{1996-98} P_t * Tr\_Full_c \beta_{PF}^t + \sum_{\substack{t=1980-83 \\ t\neq 1987-89}}^{1996-98} P_t * Tr\_Accom_c \beta_{PA}^t + u_{cpt} \quad (8)$$

To recall, the dummy variable Tr_Full_c is equal to one if the county is in a state without prior ADA-like protections or accommodations, and zero otherwise. Likewise, the dummy variable Tr_Accom_c is equal to one if the county is in a state with prior ADA-like protections but not ADA-like accommodations, and zero otherwise.

Together, these regression specifications provide several different ways to estimate the ADA's effects on SSDI outcomes. The identifying variation for these estimates comes from three sources: (i) border pairs that contain fully treated and accommodations only; (ii) border pairs that contain fully treated and ADA-like; and (iii) border pairs that contain accommodations only and ADA-like. The first is an important source of variation for the Tr_Full_c estimate as there are not many border pairs that span fully treated and ADA-like states.

3. Data

3.1 SSDI outcomes

I use several SSDI outcomes. All of these are available at the state level, while a more limited set are available at the county level.

SSDI applications and allowances

I calculate application and allowance rates at the state level. Counts of SSDI application and allowances are from Autor and Duggan (2003), which the authors make available on David Autor's website.[2] These state-level SSDI counts were taken from administrative data by Kalman Rupp and David Stapleton, and are available for 1980 to 1998 with the exception of 1981. Disability allowances are dated according to the year of application rather than the year of decision. These were extracted around the year 2000, so the data likely undercount the allowances made in the last couple of years of the data.

[2] See: https://economics.mit.edu/faculty/dautor/data/autduggan03 [Last accessed: September 24, 2021].

SSDI beneficiaries

The SSDI primary beneficiary numbers in each year are taken from digitized versions of the publication *OASDI Beneficiaries by State and County*, which until 1985 was called *Social Security Beneficiaries by State and County*. Master Beneficiary Record extracts are used to produce an end-of-year snapshot of Social Security beneficiaries in current payment status in each state and county. I have digitized them, and describe the data in more detail elsewhere (Moore 2020). I use the number of SSDI primary beneficiaries because they are available consistently through these years, although the number of SSDI dependents is highly correlated with the number of SSDI primary beneficiaries (Moore 2021). These are also available for 1980 to 1998, with the exception of 1981.

State-level and county-level counts are used. Some county borders change over time; counties that had border changes were merged together to create consistent geographical units over time. This affects relatively few counties; the changes are concentrated in Virginia, where several of the independent cities and surrounding counties have changed over time. Details of these changes are provided in the appendix.

Rates for the SSDI outcomes are created by dividing counts by the annual number of each state's or county's residents ages 18 to 64 years. These population data are taken from Census Bureau intercensal single-year-of-age, county-level population estimates compiled by the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program. The data are available on SEER's

website.[3] I use these population estimates instead of those from the Current Population Survey (CPS), used by Autor and Duggan (2003) and others, as it is not possible to create county population estimates using the CPS. There are only minor differences between these different population estimates.

Summary statistics for state-level SSDI outcomes are provided in Table 1. Data for Alaska and Hawaii are not used, as those states cannot be used in the county-level analysis, although the District of Columbia is included. The balanced panel has 882 observations (49 x 18 years). SSDI applications per working-age population average 6.3 applications per 1,000 individuals, and range between 3.0 and 13.2. The summary statistics for the SSDI allowance rate are roughly half of these values, with SSDI allowances per 1,000 individuals averaging 3.4 and ranging between 1.4 and 6.7. The total number of SSDI beneficiaries averages 21.5 per 1,000 individuals over this period, and ranges between 8.3 and 49.6.

3.2 Other data

The state-level covariates generally come from the March supplement of the Current Population Survey (CPS). The CPS is a monthly household survey conducted by the Census Bureau for the Bureau of Labor Statistics. The CPS Annual Social and Economic Supplement is conducted in March and asks additional information on income and work experience. There are around 60,000 households and 150,000 individuals in each year of the survey.

[3] See: http://seer.cancer.gov/popdata/download.html [Last accessed: September 24, 2021].

I use microdata from the CPS for 1980 to 1998 to create various covariates for each state in every year. All calculations use the standard CPS sampling weights. There are a set of demographic measures. This includes the fraction of men and women in the following age groups: 18 to 24 years, 25 to 39 years, 40 to 54 years, and 55 to 64 years. It also includes the fractions in different racial groups (white, black, and other race); educational attainment categories (less than high school, completed high school, some college, and completed college); and the fraction of men and women married. I also create a set of economic measures. This includes unemployment and labor force nonparticipation rates for men and women in the same age groups as described above.

At the county level, covariates are calculated from the intercensal data described above. The demographic controls include the same sex, age, and racial groups described above, all of which are available in these data. The other controls are not available at the county level, so there is a reliance on the more comprehensive fixed effects to account for time-varying changes in economic and other outcomes.

I use the data from Dube et al. (2010) to identify border counties and organize them into county pairs. The county identifiers were checked and corrected to account for county merges and any other inconsistencies across the data sets. There are 1,108 counties located along state boundaries in the U.S. mainland in this data set.

4. State-level results

4.1 Results for SSDI applications

I first focus on whether the ADA affects applications for SSDI. The outcome is SSDI applications per 1,000 working age individuals (ages 18 to 64), and the analysis is done for 49 states (including D.C.) between 1980 and 1998.

Figure 2 shows application rates comparing states treated by the ADA to the comparison states (i.e., the "ADA-like" states). Rates in both groups are scaled relative to 1988, to make it easier to compare the trends over time. The trends are similar prior to the passage of the ADA in 1990; the differences relative to 1988 average 0.01 applications per 1,000 population and are always within 0.2 applications per 1,000 population. The trends remain similar in 1989-1991, which is when the ADA was being developed and passed, but prior to its implementation in July 1992. The largest differences occur in 1992 and 1993, when the states treated by the ADA have SSDI application rates that average 0.34 higher than the comparison states, relative to 1988. The differences decrease from 1995, and even more so from 1997.

Table 2 shows the regression results from using various versions of Equation (2), with years grouped in three-year periods. The results reported in Column (1) come from Equation (2) only with year fixed effects; Column (2) shows results with state fixed effects added; Column (3) shows results with the addition of demographic controls; and Column (4) shows results with economic controls, which are primarily unemployment rates for specific demographic groups. This presentation helps to understand what accounts for differences across the treated and comparison states, and how stable the estimates are to different approaches.

Prior to the ADA's introduction, there are no statistically significant differences in application rates between treated and control states across these specifications, although the coefficients generally shrink with the additional controls. The post-ADA coefficients are positive and larger in magnitude than the ones before its passage. In the final column, the SSDI application rates in the ADA-treated states are higher by a statistically significant 0.34 applications per 1,000 population, or about 6.3% relative to their rates in the 1987 to 1989 period. The estimated change in rates is also positive in the 1993 to 1995 period, with a magnitude that is about 70% of the 1990 to 1992 estimate, although the coefficient is never different from zero at conventional levels of statistical significance.

To further explore this, Figure 3 shows the annual coefficients of interest and 95% confidence intervals for SSDI application rates estimated with the regression controls given in Equation (1). Relative to 1988, treated states have around 0.4 more SSDI applications in 1992 and 1993 than the comparison states. These differences are statistically different from zero at a 5% level. The differences are smaller and not statistically significant in other years.

Following Jolls and Prescott (2004), the differences in SSDI application rates are separately examined by how the ADA potentially affected the disabled workers' employment. The SSDI application rates in "No employment protection" and "Protection without accommodation" states are compared to the "ADA-like" states in Figure 4. As before, the raw SSDI application rate differences are shown relative to 1988.

Both types of treated states have similar trends to the comparison states prior to 1988 and during the 1989 to 1991 period of ADA implementation. States without

employment protections or accommodations had a large relative increase in SSDI applications beginning in 1992 and peaking around 1.2 SSDI applications per 1,000 population in 1994. The differences decrease, but are more persistent than observed in the overall sample. By 1998, states with pre-ADA employment protections still had 0.6 more SSDI applications per 1,000 population than the comparison states. States with pre-ADA employment protections but no accommodations had a pattern similar to the overall results, with the same trends as the comparison sample, except with slightly elevated application rates between 1992 and 1994.

The regression Equation (2) is estimated separately for these two groups of treated states, and the results are presented in Table 3. Throughout, all of the ADA-like states are used as the comparison sample; Equation (2) is used for ease of exposition, as it produces results similar to using Equation (4). The first set of results are equivalent to those in Column (4) of Table 2, as they come from a specification that includes year and state fixed effects, as well as time-varying demographic and economic controls. A second set of results is added that also includes state-specific linear time trends, as a further form of robustness.

Across the results in Table 3, there are no statistically significant differences in SSDI application rates prior to the ADA's introduction. After the ADA, treated states that did not have employment protections or accommodations experienced an increase in SSDI application rates, as shown in Columns (1) and (2). In the 1990 to 1992 period, SSDI applications are 0.4 to 0.5 higher per 1,000 population, although only statistically different from zero at the 5% level in the specification with state time trends. In the 1993 to 1995 period, the changes are larger — around 1.1 to 1.2 SSDI applications per 1,000

population — and statistically significant at the 5% level with or without state-specific time trends. Relative to the reference-period mean in these states, this represents an increase of 13% to 15% in SSDI applications.

The estimates for treated states that had protections but no accommodations are presented in Columns (3) and (4) of Table 3. Without state-specific linear time trends, there is an increase of 0.34 SSDI applications per 1,000 population in the 1990 to 1992 period that is statistically significant at the 5% level. Relative to treated states' average SSDI application rates in the reference period, this implies a relative increase of around 6.3%. There are estimated increases of around 0.2 in the subsequent periods that are not statistically significant at the 5% level. The estimated coefficients are smaller with the introduction of state time trends, and not statistically different from zero.

To further explore this, Figure 5 shows the annual coefficients of interest and 95% confidence intervals for SSDI application rates for treated states without protections or accommodations (in Panel A) and treated states with protections and no accommodations (in Panel B). These are estimated with Equation (1), and show the differences in SSDI application rates relative to 1988. In both panels, the annual coefficients prior to 1988 are not statistically significant at the 5% level. In the "no protections" states, the post-ADA estimated differences are positive and statistically significant at the 5% level over the 1991 to 1994 period. In the "protections but no accommodations" states, the estimated changes are statistically significant in 1991 and 1992. In both panels, the post-ADA estimates are generally positive in other years, but not statistically different from zero at the 5% level.

In summary, there is evidence of an increase in SSDI applications in the years immediately after the ADA's implementation. These effects are largest in the states affected by the disability employment protections contained within the ADA, both in absolute and relative terms, although there is a smaller and less-precisely estimated increase in states only affected by the ADA's disability employment accommodations.

4.2 Results for SSDI allowances

I next consider changes in SSDI allowances. During this period, around half of SSDI applications resulted in the allowance of SSDI benefits, although applicants induced to apply as a result of the ADA may have had a different likelihood of being allowed SSDI.

The analysis parallels that done for SSDI applications, as all of the data has the same state-level structure and uses the same covariates. Figure 6 shows SSDI allowance rates comparing ADA-treated states to the comparison states. Rates in both groups are scaled relative to 1988 to make it easier to compare the trends over time. The trends are relatively similar prior to the ADA's passage, although they are even closer after the its passage. Unlike the raw rates for SSDI applications, there is no visual evidence that allowance rates changed after the ADA's introduction.

The lack of a change in SSDI allowance rates in ADA-treated states relative to states already like the ADA is confirmed in Table 4's regression results. These results come from various versions of Equation (2), with years grouped in three-year periods. The results reported in Column (1) come from Equation (2) only with year fixed effects; Column (2) shows results with state fixed effects added; Column (3) shows results with the addition of demographic controls; and Column (4) shows results with economic

controls, which are primarily unemployment rates for specific demographic groups. Across these results, there are no statistically significant coefficients before or after the ADA. This could partially reflect the lower frequency of allowances compared to applications, although the coefficients' magnitude is generally less than one-half of those for SSDI applications in Table 2.

To further explore this, Figure 7 shows the annual coefficients of interest and 95% confidence intervals for SSDI allowance rates estimated using Equation (1). Relative to 1988, SSDI allowance rates are slightly higher after the ADA for several years in treated states, although the coefficients are small and not statistically different from zero.

As with the analysis of SSDI applications, allowances are analyzed separately in "no employment protection" and "protection without accommodation" states relative to "ADA-like" states. The raw rates are presented in Figure 8, the estimated effects from regressions using three-year periods are presented in Table 5, and the annual regression coefficients are presented in Figure 9. Across these results, there is no clear relationship between the SSDI allowance rate and the ADA across the two types of treatment it may have delivered. The only statistically significant results are for the states without employment protections in regressions when state-specific linear time trends are used. However, the most flexible regression results in Figure 9a suggest that these results are fragile.

In summary, there is no discernible change in SSDI allowance rates after the ADA. This may partly be due to less precision being available for this outcome although, in general, it looks as though the changes in SSDI application rates did not strongly

elevate SSDI allowance rates. It may be that the extra applications were from marginal applicants, leading to lower-than-average allowance rates.

4.3 Results for SSDI beneficiaries

I next consider changes in overall SSDI beneficiary numbers. Annual changes are due to the changes in allowances relative to terminations. This SSDI outcome, therefore, provides another way to analyze the ADA's effects. It is also the SSDI outcome available at the county level, which provides a different way to examine the effects of the ADA.

Figure 10 shows SSDI beneficiary rates comparing ADA-treated states to the comparison states. Rates in both groups are scaled relative to 1988, to make it easier to compare the trends over time. The trends are relatively similar prior to the ADA's passage, although they are even closer after the its passage. Unlike the raw rates for SSDI applications, and consistent with the results for SSDI allowances, there is no visual evidence that allowance rates changed after the ADA's introduction.

The lack of a change in SSDI beneficiary numbers in ADA-treated states relative to states already like the ADA is also apparent in the regression results presented in Table 6. These results come from various versions of Equation (2), with years grouped in three-year periods. With the extra controls across Columns (1) to (4), the coefficients shrink but the post-ADA estimates are always similar to or smaller than the pre-ADA estimates. Across these results, there are no statistically significant coefficients before or after the ADA. This is also similar in Figure 11, which shows the annual coefficients of interest and 95% confidence intervals for SSDI beneficiary rates estimated using

Equation (1). Relative to 1988, the coefficients are small and not statistically different from zero.

With only three states without disability employment protections prior to the ADA, effects in this group may be missed in the aggregate analysis. To examine this, I separately examine how the ADA potentially affected “no employment protection” states and “protection without accommodation” states.

In Figure 12, the raw SSDI application rates are shown for these two groups relative “ADA-like” states relative to 1988. Both types of treated states have fairly similar trends relative to the comparison states prior to 1988. In the years after the ADA, the gap in SSDI beneficiary numbers increases between “no employment protection” and “ADA-like” states over time. In contrast, there is no meaningful difference in the SSDI beneficiary rates in the “protection without accommodation” states compared to the
“ADA-like” states.

The regression Equation (2) is estimated separately for these two groups of treated states, and the results are shown in Table 7. In both cases, all of the ADA-like states are used as the comparison sample. These regression results parallel the graphical evidence in Figure 12. Across the results, there are no statistically significant differences in SSDI beneficiary rates prior to the ADA’s introduction. After the ADA, treated states that did not have employment protections or accommodations experienced an increase in the number of SSDI beneficiaries, as shown in Columns (1) and (2). Without state time trends, the coefficients reach statistically significant levels in the 1993 to 1995 period, when the estimated increase is around 2.6 beneficiaries per 1,000 population. Relative to the reference-period mean in these treated states, this

represents an increase of 9.1% in SSDI beneficiary rates. In the 1996 to 1998 period, the difference is higher, at 4.3 beneficiaries per 1,000 population. This is statistically significant at the 1% level, and around 15% higher relative to the reference-period mean. When state-specific time trends are included, the coefficients shrink slightly by around 25% to 30%, and only the estimate for the 1996 to 1998 period is statistically significant at the 5% level or less.

The estimates for treated states that had protections but no accommodations are presented in Columns (3) and (4) of Table 7. All of the estimated changes in SSDI beneficiary rates relative to the 1987 to 1989 reference period are smaller and not statistically different from zero at conventional levels.

To further explore this, Figure 13 shows the annual coefficients of interest and 95% confidence intervals for SSDI beneficiary rates for treated states without protections or accommodations (in Panel A) and treated states with protections and no accommodations (in Panel B). These are estimated with Equation (1), and show the differences in SSDI beneficiary rates relative to 1988. The estimated coefficients match the evidence in Table 7, with statistically significant post-ADA estimates for the “no employment protection” states but not for “protection without accommodation” states.

In summary, there is evidence of an increase in SSDI beneficiaries several years after the ADA’s implementation. These effects come from states affected by the disability employment protections contained within the ADA, rather than in states only affected by the ADA’s disability employment accommodations. This is consistent with the results for SSDI applications, although it may reflect differences due to terminations rather than only through SSDI entry.

5. County-level results for SSDI beneficiaries

As discussed in Section 4, time-varying, location-based fixed effects cannot be implemented with the state-level data. The results using county-level data are limited to SSDI beneficiaries, but they provide useful robustness checks for the state-level results. I focus on counties lying on a state border and compare counties in states whose disability employment conditions are affected by the ADA to adjacent counties that are not. In the data set, there are 1,108 counties on state borders. They create 2,239 groups spanning state borders. As with the state-level analysis, the data span from 1980 to 1998, with 1981 missing from the analysis.

The analysis uses the three-year periods to increase precision, and the overall estimates come from Equation (6). As before, the reference period is 1987 to 1989, and the estimated effects measure the differences between ADA-treated states and comparison states in terms of the number of SSDI beneficiaries per 1,000 population. The coefficients and standard errors are shown in Column (1) of Table 8. Relative to the reference period, there is a difference of -0.81 beneficiaries in 1980 to 1983 in treated states that is statistically significant at the 5% level. After the ADA, the coefficients become positive and larger. The 1996 to 1998 coefficient is 1.24 beneficiaries per 1,000 population, but this difference is not statistically significant at conventional levels.

There is evidence that the trend is not fully accounted for by the fixed effects and time-varying demographic controls. In Table 8's Column (2), I report estimates from Equation (6) with state-specific linear time trends. The pre-ADA coefficients are now not statistically different from zero. The coefficients after the ADA's introduction also shrink, although a reduction in the standard errors means that the relative difference in the

1990 to 1992 period is now statistically significant at the 5% level. The point estimate, an increase of 0.4 beneficiaries per 1,000 population, represents a 2% increase in beneficiary numbers in treated states. The later coefficients are slightly larger, although not statistically significant at the 5% level.

Table 9 presents results for the different samples in terms of how states were affected by the ADA. The SSDI application rates in “no employment protection” and “protection without accommodation” states are compared to each other and the comparison “ADA-like” states. This breakdown is less informative than for the state-level analysis, possibly indicating that the unemployment rate controls available for that analysis but not for the county-level analysis are important for accounting for underlying trends in SSDI beneficiary numbers.

In Table 9’s Column (1) , states without employment protections have elevated SSDI numbers in four of the five three-year periods relative to the 1987 to 1989 reference period, including one prior to the ADA’s introduction. State time trends are added to the estimating equation, and the results are shown in Column (2). The coefficients shrink, although the coefficient for 1984 to 1986 is positive and statistically significant at the 1% level, while none of the others are. In Columns (3) and (4), equivalent results are presented for states that had employment protections but no disability accommodations. For these treated states, across both specifications, the pre-ADA estimates are not statistically significant at conventional levels. After the ADA, the estimates are positive and larger, although only one of the three coefficients in each of the regressions are statistically significant at the 1% level. This provides suggestive

evidence of an increase in SSDI beneficiary rates in states treated with disability accommodations but not protections.

In summary, these additional results indicate that there may have been some increase in SSDI beneficiary numbers after the ADA's introduction. However, the gains from being able to analyze outcomes at the county level are offset by the fewer controls and more limited SSDI outcomes.

6. Conclusion

The results point to the ADA, and employment laws for disabled workers more generally, as a determinant of SSDI outcomes. This adds to research that has examined the sources of geographic variation in federal disability receipt (e.g., Coe et al. 2011, Gettens et al. 2018, Chaffin and Corder 2018).

The results point to an SSDI increase concentrated in the three Southern states that had the most limited disability employment laws prior to the ADA's passage. These results suggest that concerns about the ADA having decreased employment may be valid, and that disabled workers with reduced employment prospects were more likely to use SSDI when the ADA increased employment protections.

However, the results are not sufficiently precise or consistent to be entirely confident about these effects. It will be important to examine the ADA's effects on Supplemental Security Income (SSI), as that protects individuals with more limited work histories who may be more likely affected by employment incentive changes. This will be done in a follow-on project and, in combination, it is hoped that these projects shed light on the important issues around how disability employment laws interact with the federal safety net for disabled workers.

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Tables and figures

Figure 1: Map showing the different states with existing "ADA-like" regulations, disability employment protections but not accommodations, and neither protections nor accommodations

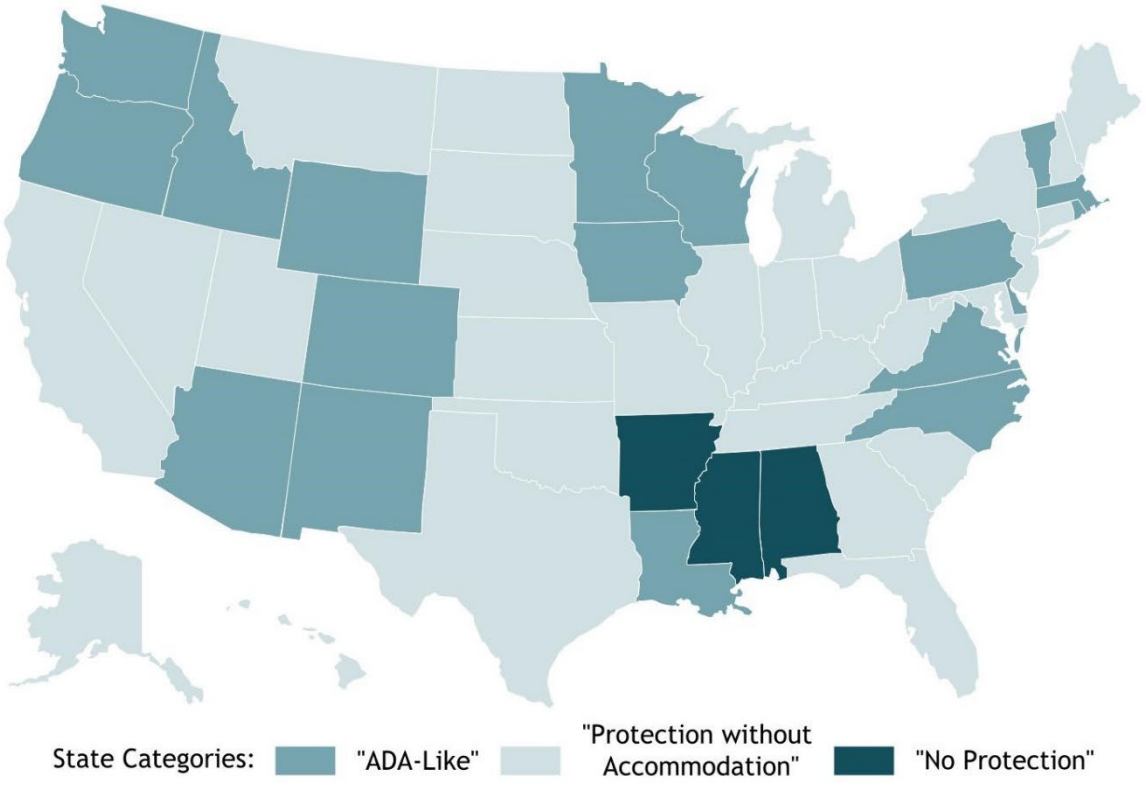


Figure 2: Comparison of SSDI application rates in states with and without existing disability employment laws similar to the Americans with Disabilities Act of 1990, relative to rates in 1988

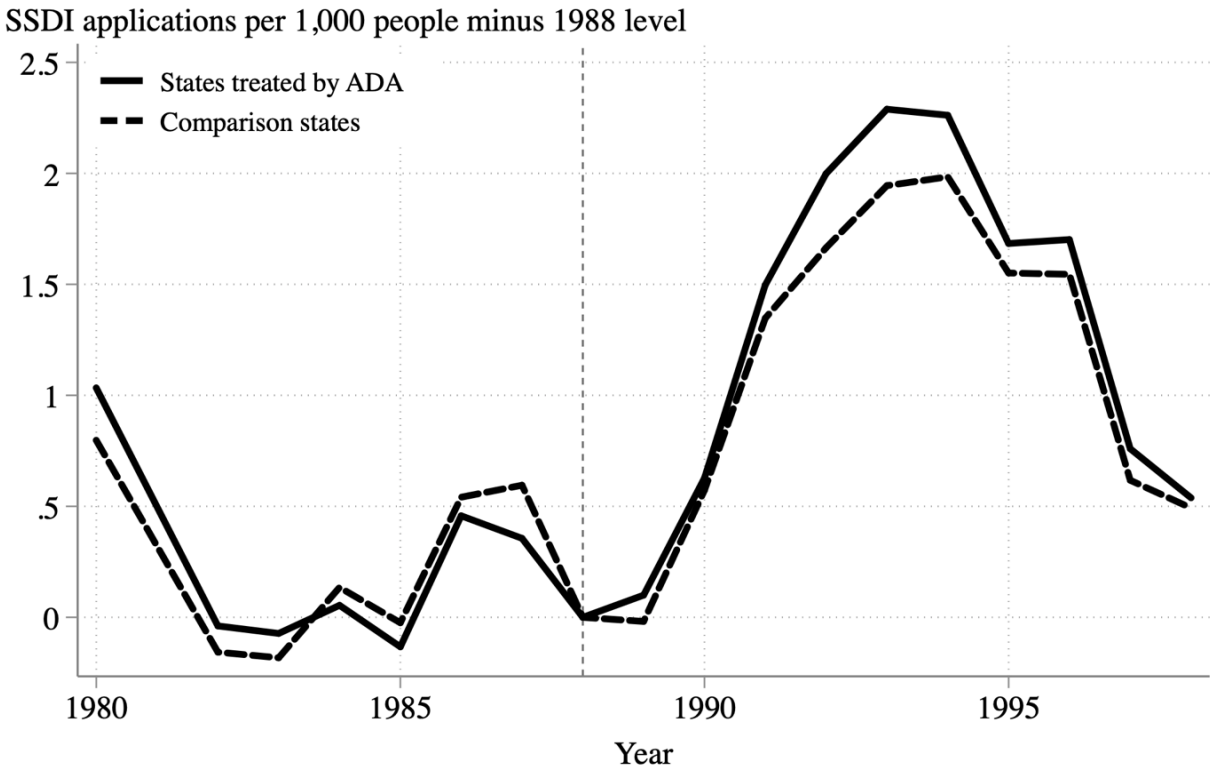


Figure 3: Estimated differences in SSDI applications rates in states treated by the ADA relative to comparison states, coefficients and 95% confidence intervals

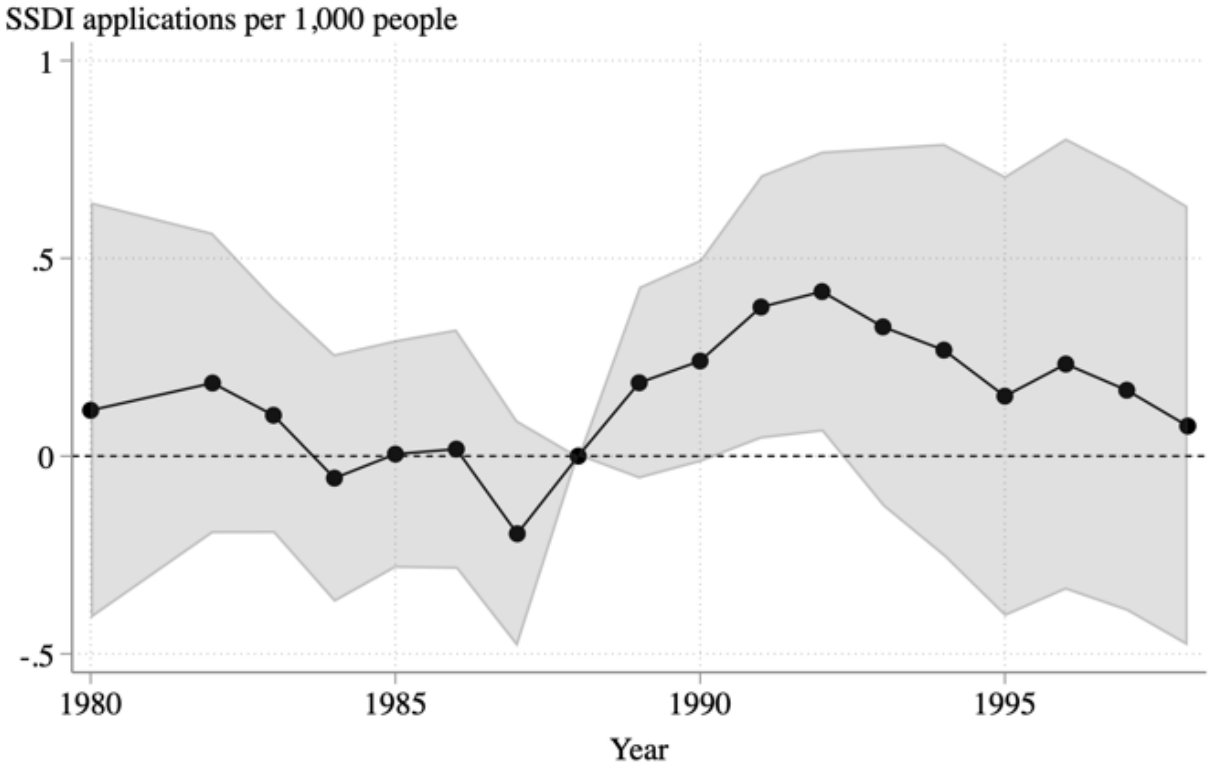
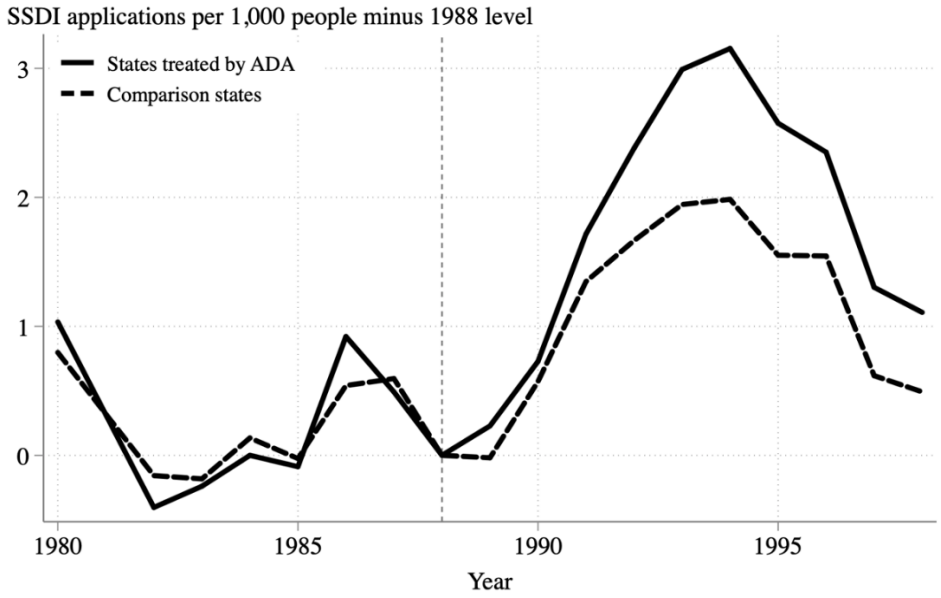


Figure 4: Comparison of SSDI application rates in states with and without existing disability employment laws similar to the Americans with Disabilities Act of 1990, relative to rates in 1988

A: "No employment protection" versus "ADA-like" states



B: "Protection without accommodation" versus "ADA-like" states

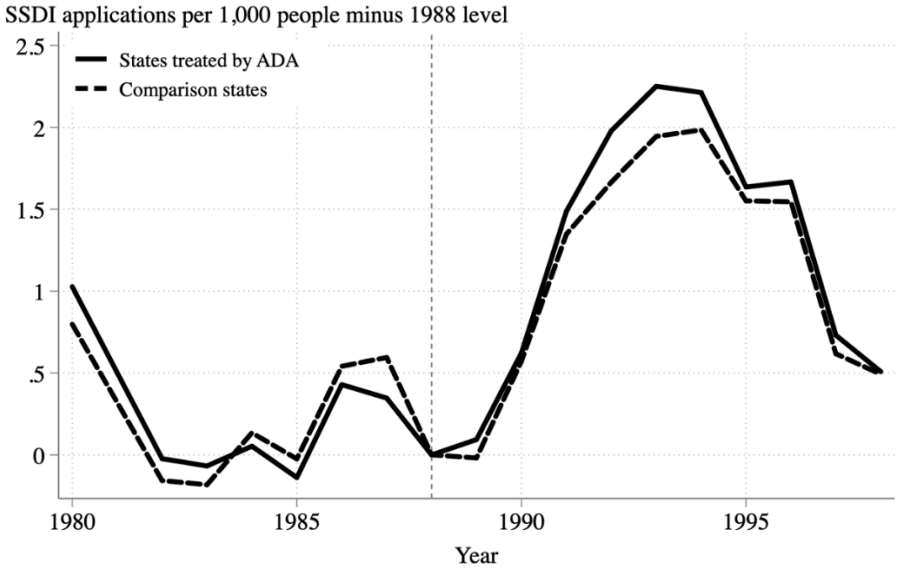
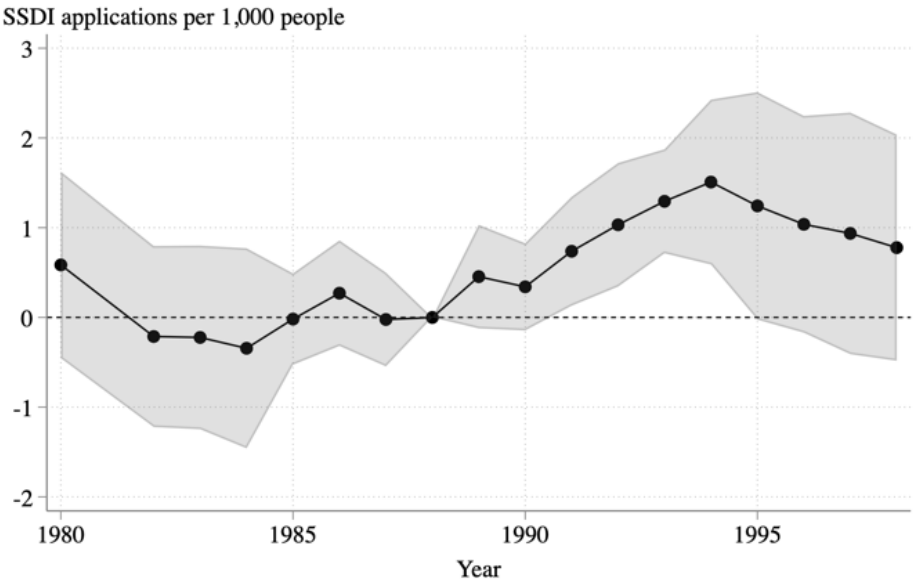


Figure 5: Estimated differences in SSDI application rates in states treated by the Americans with Disabilities Act of 1990 relative to comparison states

A: “No employment protection” versus “ADA-like” states



B: “Protection without accommodation” versus “ADA-like” states

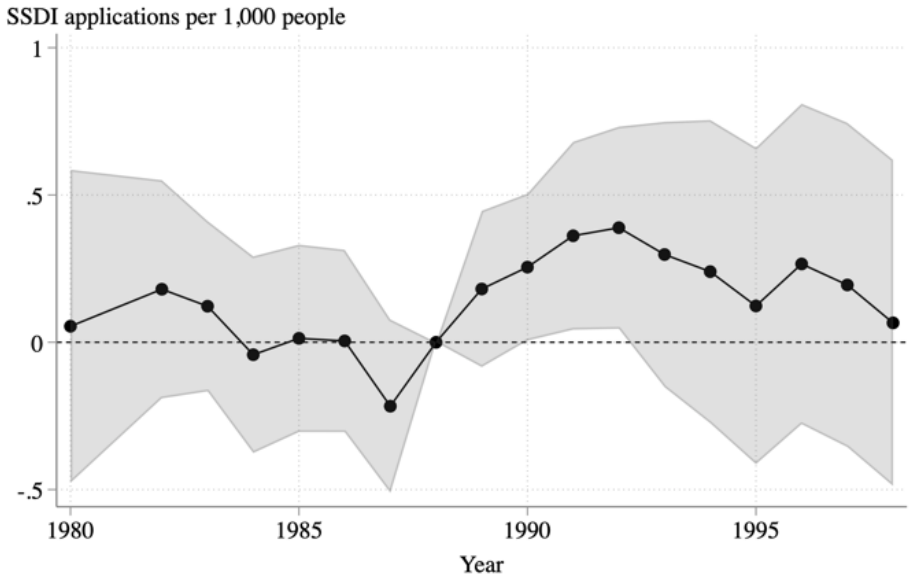


Figure 6: Comparison of SSDI allowance rates in states with and without existing disability employment laws similar to the Americans with Disabilities Act of 1990, relative to rates in 1988

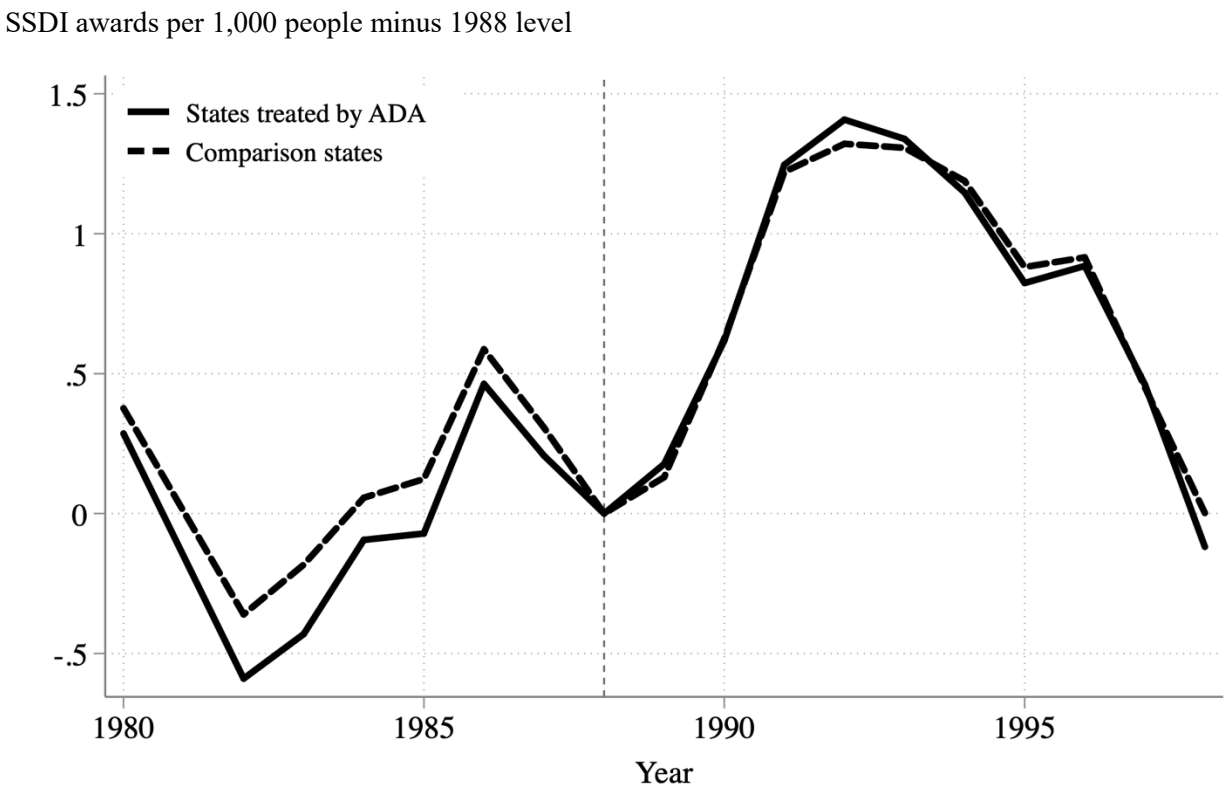


Figure 7: Estimated differences in SSDI award rates in states treated by the Americans with Disabilities Act of 1990 relative to comparison states

SSDI allowances per 1,000 people

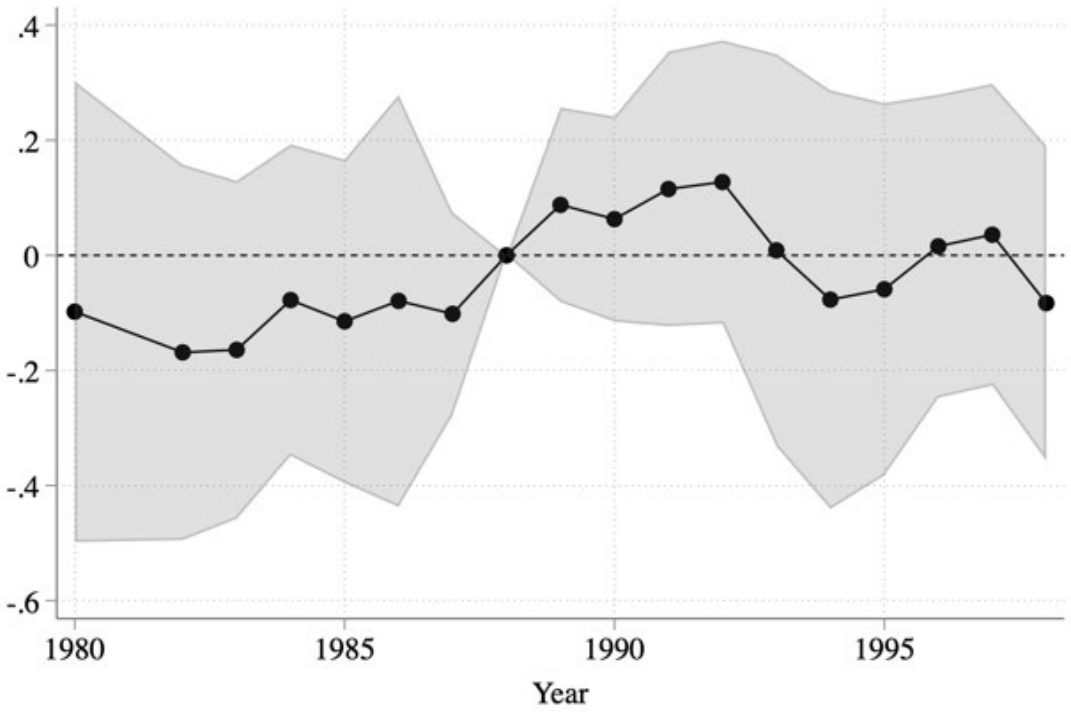
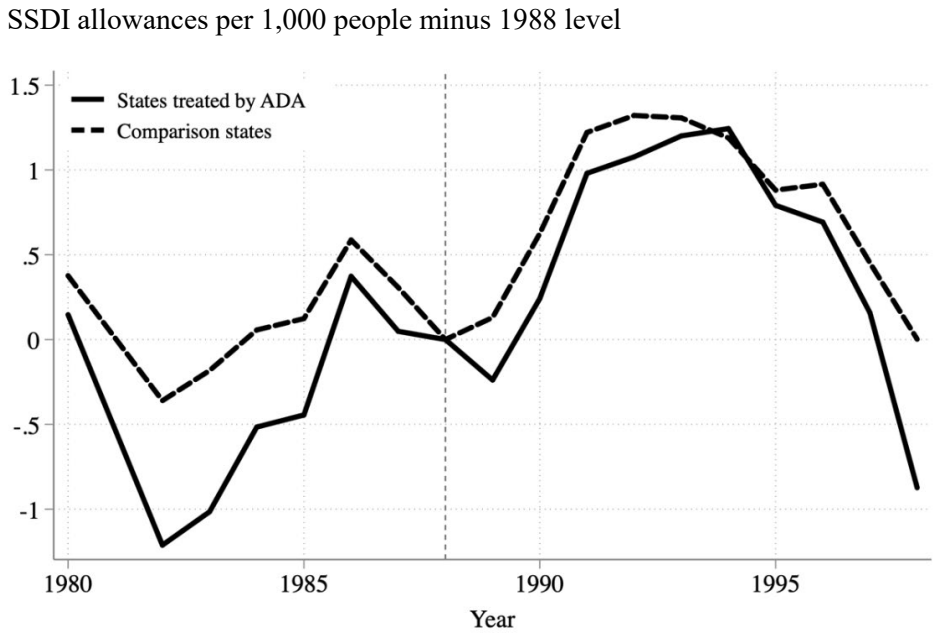


Figure 8: Comparison of SSDI allowance rates in states with and without existing disability employment laws similar to the Americans with Disabilities Act of 1990, relative to rates in 1988

A: "No employment protection" versus "ADA-like" states



B: "Protection without accommodation" versus "ADA-like" states

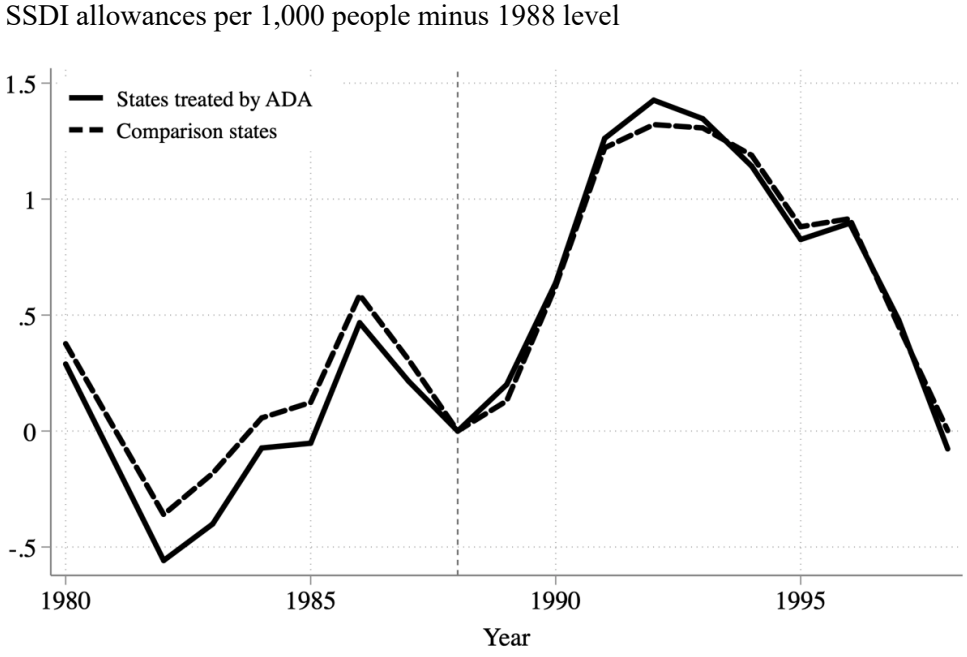
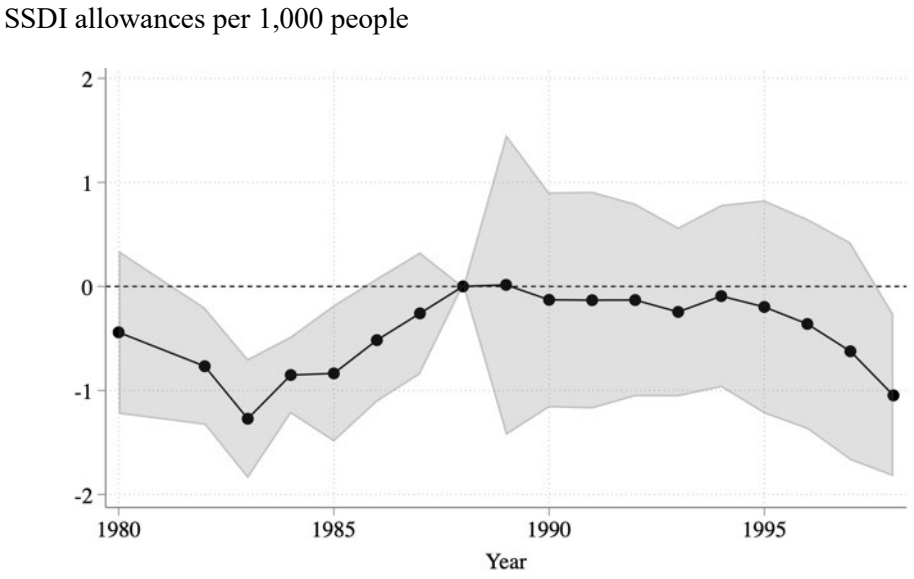


Figure 9: Estimated differences in SSDI allowance rates in states treated by the Americans with Disabilities Act of 1990 relative to comparison states

A: "No employment protection" versus "ADA-like" states



B: "Protection without accommodation" versus "ADA-like" states

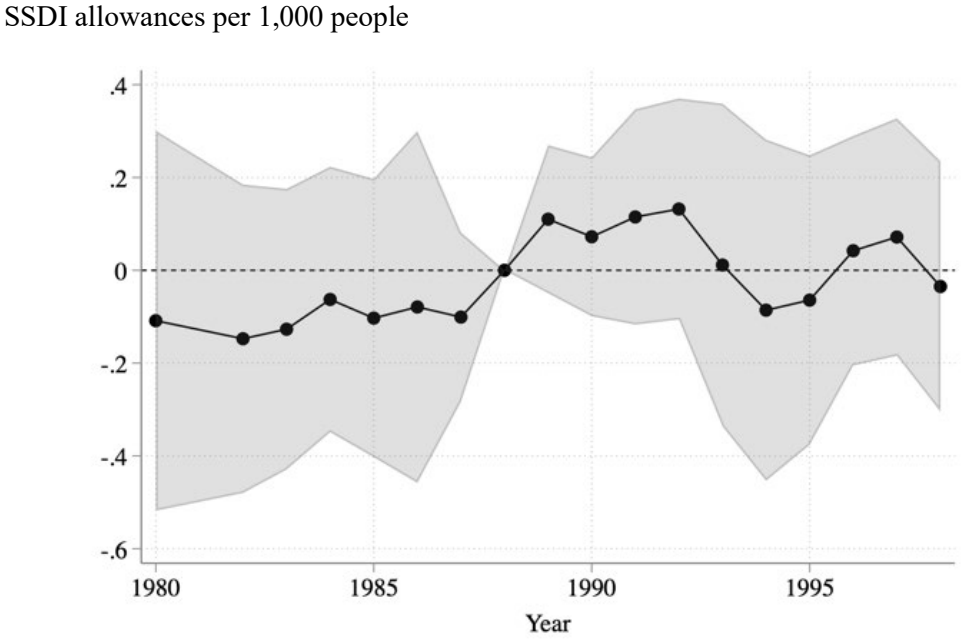


Figure 10: Comparison of SSDI beneficiary rates in states with and without existing disability employment laws similar to the Americans with Disabilities Act of 1990, relative to rates in 1988

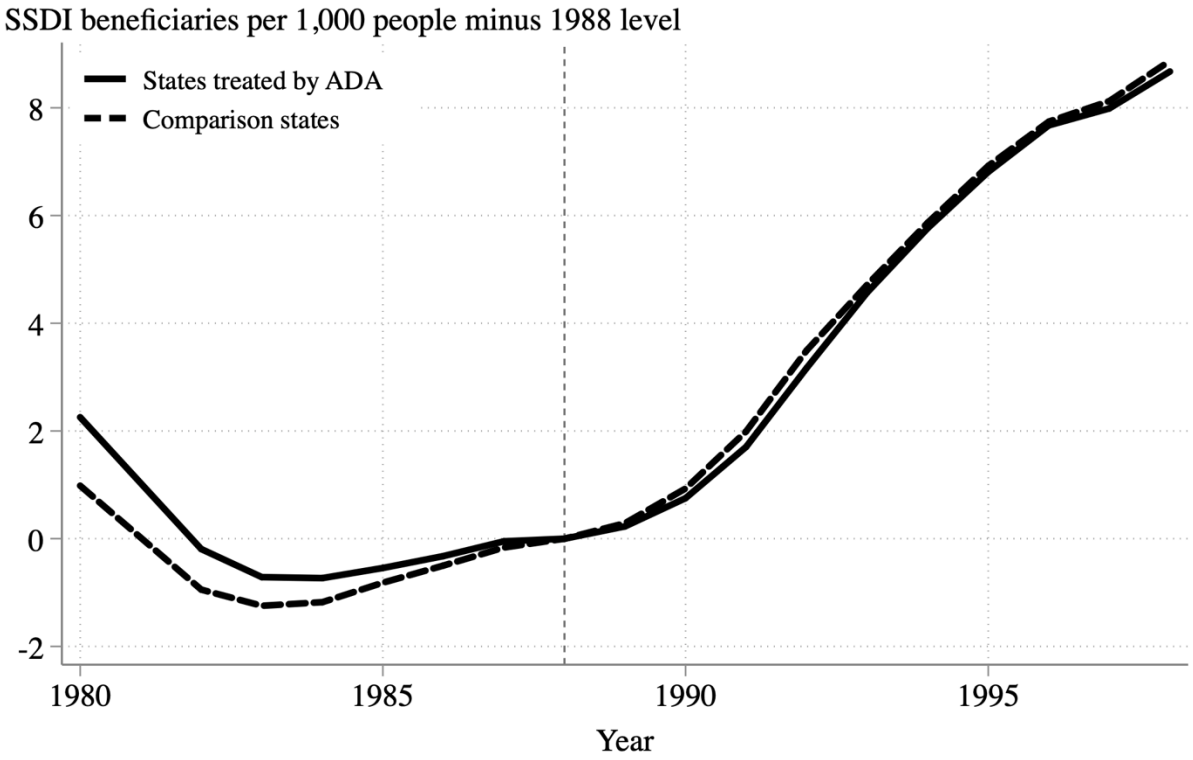


Figure 11: Estimated differences in SSDI beneficiary rates in states treated by the Americans with Disabilities Act of 1990 relative to comparison states

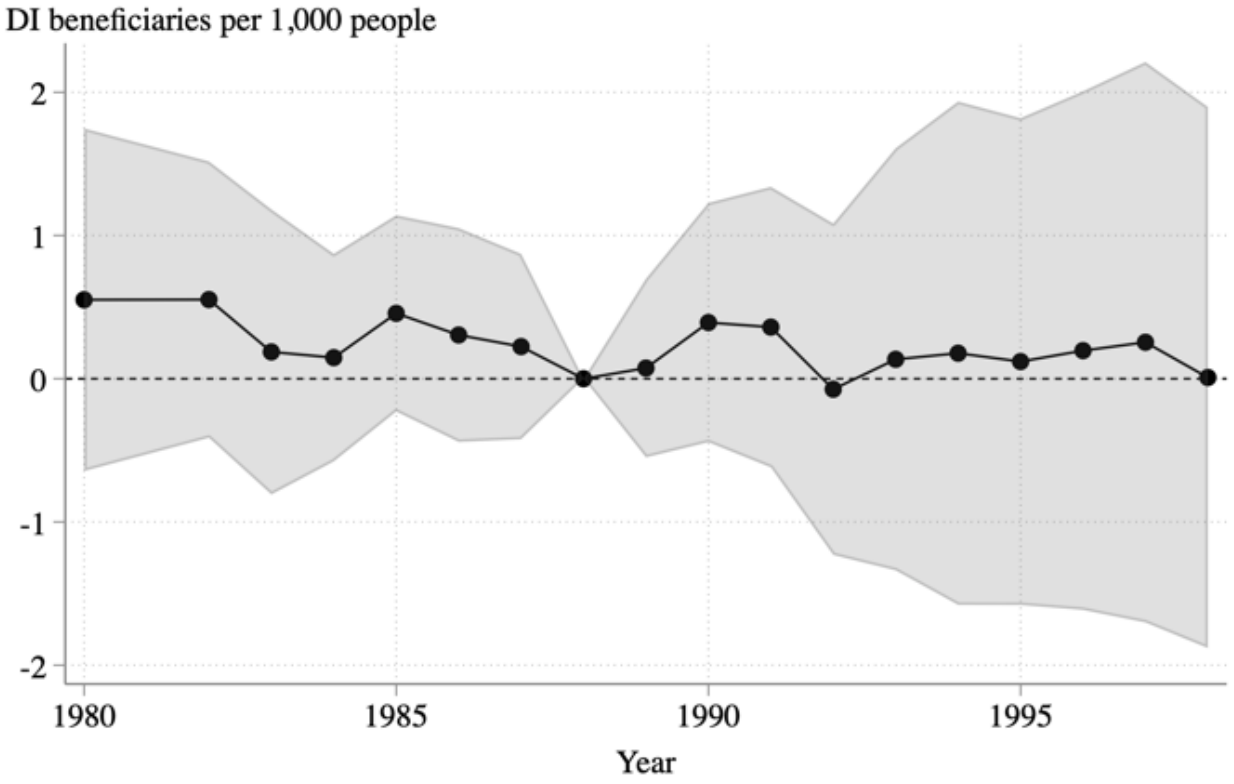
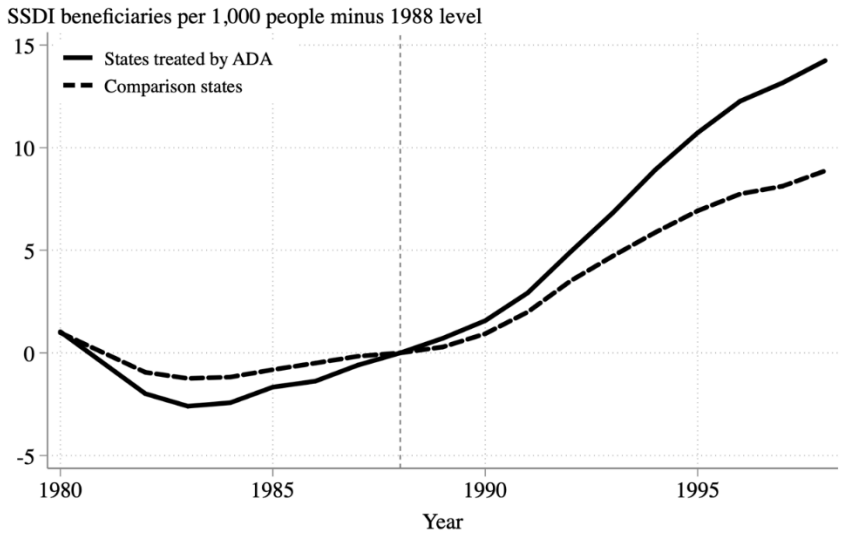


Figure 12: Comparison of SSDI beneficiary rates in states with and without existing disability employment laws similar to the Americans with Disabilities Act of 1990, relative to rates in 1988

A: “No employment protection” versus “ADA-like” states



B: “Protection without accommodation” versus “ADA-like” states

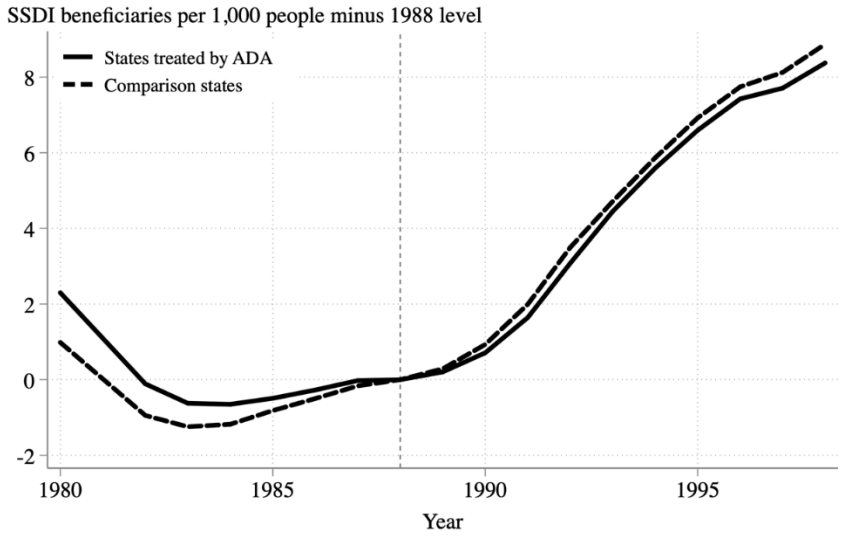
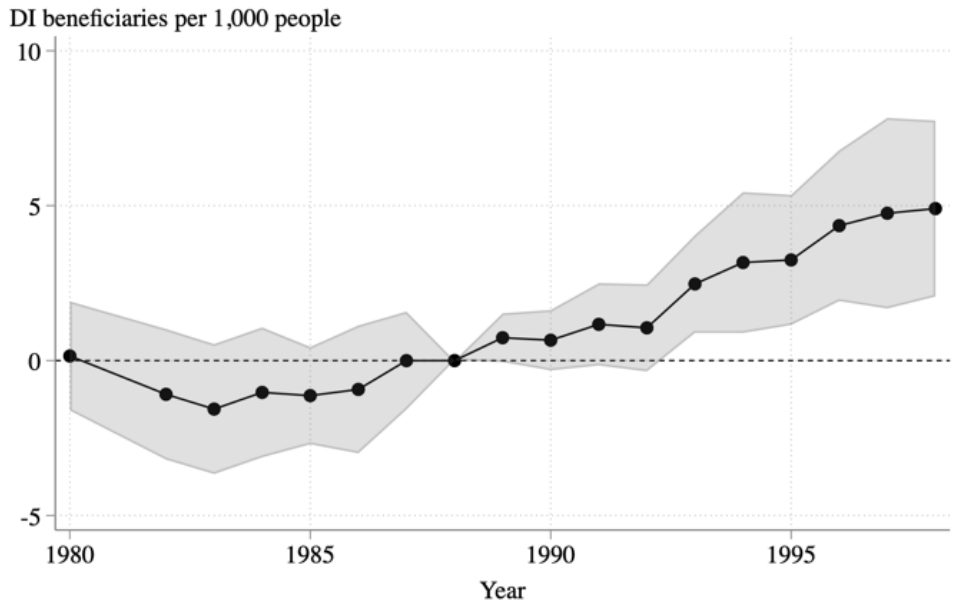


Figure 13: Estimated differences in SSDI beneficiary rates in states treated by the Americans with Disabilities Act of 1990 relative to comparison states

A: “No employment protection” versus “ADA-like” states



B: “Protection without accommodation” versus “ADA-like” states

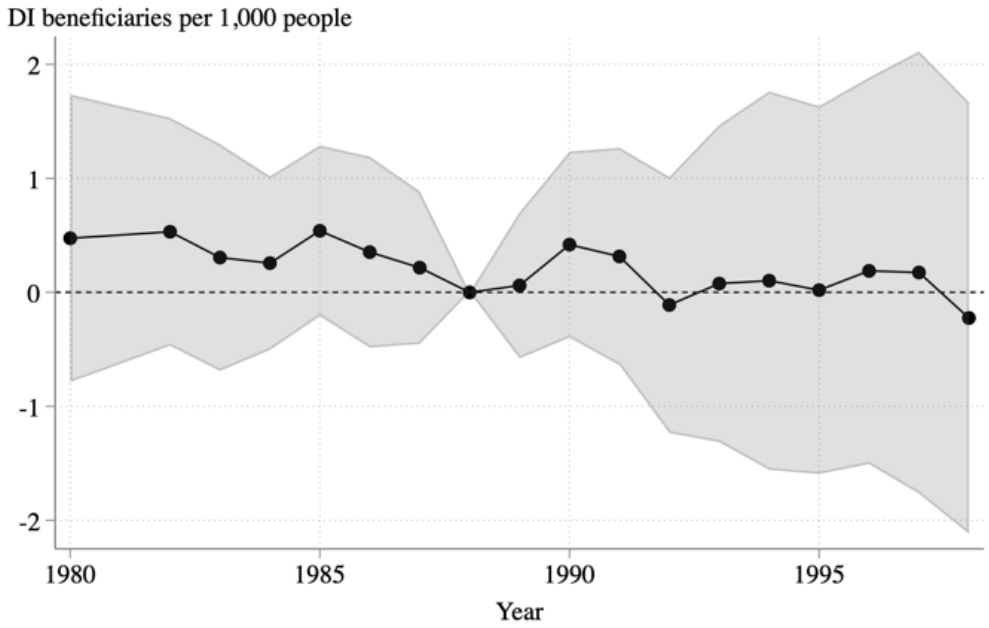


Table 1: Summary statistics for SSDI state outcomes, 1980 to 1998

Variable Name	Observations	Mean	Std. Dev.	Min	Max
Identifiers					
Year	882	--	--	1980	1998
State FIPS codes	882	--	--	1	56
SSDI Outcomes					
Total applications	882	19,417	19,997	934	129,160
Total applications per 1,000 people	882	6.3	1.6	3.0	13.2
Total allowances	882	10,270	10,402	423	66,878
Total allowances per 1,000 people	882	3.4	1.0	1.4	6.7
Total beneficiaries	882	65,375	64,688	2,557	404,560
Total beneficiaries per 1,000 people	882	21.5	6.9	8.3	49.6

Notes: This table summarizes the annual state-level SSDI data. The sample includes all years from 1980 to 1998 except 1981. The sample includes Washington, D.C., and all states except Alaska and Hawaii. FIPS stands for Federal Information Processing System.

Table 2: Estimated differences in SSDI applications per 1000 people in all states treated by the Americans with Disabilities Act relative to comparison states

	Model with year fixed effects	Adding state fixed effects	Adding demographic controls	Adding economic controls
	(1)	(2)	(3)	(4)
Years 1980-83	0.407 (0.302)	0.184 (0.273)	0.081 (0.246)	0.133 (0.160)
Years 1984-86	0.162 (0.321)	-0.052 (0.161)	-0.129 (0.162)	-0.010 (0.111)
Years 1987-89	--	--	--	--
Years 1990-92	0.433 (0.365)	0.216 (0.211)	0.276 (0.214)	0.338* (0.163)
Years 1993-95	0.503 (0.433)	0.275 (0.319)	0.224 (0.306)	0.245 (0.260)
Years 1996-98	0.367 (0.431)	0.136 (0.343)	0.096 (0.339)	0.156 (0.288)
Average rate in treated states in the reference period	5.36	5.36	5.36	5.36
Number of observations	882	882	882	882
R-squared	0.333	0.899	0.907	0.925
Year fixed effects	X	X	X	X
State fixed effects		X	X	X
Demographic controls			X	X
Economic controls				X

Note: * denotes p<0.05.

Table 3: Estimated differences in SSDI applications per 1000 people in states treated by the Americans with Disabilities Act relative to comparison states

	Treated states with no employment protection		Treated states with protections but no accommodations	
	Base model	Adding time trends	Base model	Adding time trends
	(1)	(2)	(3)	(4)
Years 1980-83	-0.096	-0.152	0.126	0.216
	(0.368)	(0.535)	(0.147)	(0.259)
Years 1984-86	-0.153	-0.226	-0.000	0.006
	(0.262)	(0.345)	(0.108)	(0.149)
Years 1987-89	--	--	--	--
Years 1990-92	0.534	0.416*	0.337*	0.176
	(0.267)	(0.195)	(0.157)	(0.147)
Years 1993-95	1.156*	1.144**	0.225	0.053
	(0.467)	(0.317)	(0.256)	(0.246)
Years 1996-98	0.725	0.472	0.180	0.012
	(0.588)	(0.370)	(0.281)	(0.304)
Average rate in treated states in the reference period	8.14	8.14	5.43	5.43
Number of observations	396	396	810	810
R-squared	0.932	0.959	0.918	0.950
State-specific time trends		X		X

Notes: * denotes p<0.05, ** denotes p<0.01. Standard errors in parentheses are clustered by state. All columns include state and year fixed effects, demographic controls, and economic controls. Observations weighted by the size of the state's adult population.

Table 4: Estimated differences in SSDI allowances per 1000 people in all states treated by the Americans with Disabilities Act relative to comparison states

	Model with year fixed effects	Adding state fixed effects	Adding demographic controls	Adding economic controls
	(1)	(2)	(3)	(4)
Years 1980-83	-0.129	-0.188	-0.193	-0.143
	(0.156)	(0.139)	(0.139)	(0.148)
Years 1984-86	-0.095	-0.144	-0.158	-0.088
	(0.190)	(0.106)	(0.110)	(0.121)
Years 1987-89	--	--	--	--
Years 1990-92	0.096	0.053	0.059	0.103
	(0.224)	(0.111)	(0.105)	(0.105)
Years 1993-95	0.038	-0.008	-0.040	-0.041
	(0.296)	(0.190)	(0.177)	(0.178)
Years 1996-98	0.014	-0.032	-0.063	-0.009
	(0.260)	(0.171)	(0.162)	(0.135)
Average rate in treated states in the reference period	2.95	2.95	2.95	2.95
Number of observations	882	882	882	882
R-squared	0.413	0.868	0.875	0.889
Year fixed effects	X	X	X	X
State fixed effects		X	X	X
Demographic controls			X	X
Economic controls				X

Table 5: Estimated differences in SSDI allowances per 1000 people in states treated by the Americans with Disabilities Act relative to comparison states

	Treated states with no employment protection		Treated states with protections but no accommodations	
	Base model	Adding time trends	Base model	Adding time trends
	(1)	(2)	(3)	(4)
Years 1980-83	-0.400	-1.196**	-0.135	-0.192
	(0.311)	(0.344)	(0.150)	(0.161)
Years 1984-86	-0.281	-0.706**	-0.087	-0.142
	(0.237)	(0.221)	(0.126)	(0.129)
Years 1987-89	--	--	--	--
Years 1990-92	0.166	0.265	0.099	0.030
	(0.293)	(0.192)	(0.103)	(0.103)
Years 1993-95	0.312	0.742**	-0.053	-0.068
	(0.341)	(0.202)	(0.178)	(0.191)
Years 1996-98	-0.071	0.438	0.020	0.014
	(0.367)	(0.263)	(0.132)	(0.179)
Average rate in treated states in the reference period	4.63	4.63	2.86	2.86
Number of observations	396	396	810	810
R-squared	0.886	0.939	0.880	0.938
State-specific time trends		X		X

Note: * denotes p<0.05, ** denotes p<0.01. Standard errors in parentheses are clustered by state. All columns include state and year fixed effects, demographic controls, and economic controls. Observations weighted by the size of the state's adult population.

Table 6: Estimated differences in SSDI beneficiaries per 1000 people in all states treated by the Americans with Disabilities Act relative to comparison states

	Model with year fixed effects	Adding state fixed effects	Adding demographic controls	Adding economic controls
	(1)	(2)	(3)	(4)
Years 1980-83	0.930	0.733	0.099	0.339
	(1.290)	(0.668)	(0.534)	(0.490)
Years 1984-86	0.380	0.249	-0.073	0.207
	(1.210)	(0.391)	(0.329)	(0.271)
Years 1987-89	--	--	--	--
Years 1990-92	-0.183	-0.283	0.023	0.128
	(1.367)	(0.330)	(0.360)	(0.384)
Years 1993-95	-0.037	-0.170	0.183	0.059
	(1.675)	(0.739)	(0.715)	(0.732)
Years 1996-98	-0.053	-0.187	0.197	0.061
	(2.016)	(0.993)	(0.924)	(0.859)
Average rate in treated states in the reference period	18.2	18.2	18.2	18.2
Number of observations	882	882	882	882
R-squared	0.326	0.945	0.961	0.966
Year fixed effects	X	X	X	X
State fixed effects		X	X	X
Demographic controls			X	X
Economic controls				X

Table 7: Estimated differences in SSDI beneficiaries per 1000 people in states treated by the Americans with Disabilities Act relative to comparison states

	Treated states with no employment protection		Treated states with protections but no accommodations	
	Base model	Adding time trends	Base model	Adding time trends
	(1)	(2)	(3)	(4)
Years 1980-83	-1.105	-0.417	0.349	-0.166
	(0.835)	(0.798)	(0.475)	(0.476)
Years 1984-86	-1.279	-0.948	0.288	-0.141
	(0.742)	(0.573)	(0.279)	(0.313)
Years 1987-89	--	--	--	--
Years 1990-92	0.654	0.327	0.116	0.150
	(0.522)	(0.501)	(0.369)	(0.240)
Years 1993-95	2.633**	1.905	-0.015	0.416
	(0.793)	(0.991)	(0.696)	(0.492)
Years 1996-98	4.334**	3.271*	-0.043	0.689
	(1.098)	(1.168)	(0.852)	(0.676)
Average rate in treated states in the reference period	28.9	28.9	17.6	17.6
Number of observations	396	396	810	810
R-squared	0.972	0.991	0.964	0.988
State-specific time trends		X		X

Notes: * denotes p<0.05, ** denotes p<0.01. Standard errors in parentheses are clustered by state. All columns include state and year fixed effects, demographic controls, and economic controls. Observations weighted by the size of the state's adult population.

Table 8: Estimated differences in SSDI beneficiaries per 1000 people in border counties treated by the Americans with Disabilities Act relative to contiguous counties in unaffected states

	Base model	Adding time trends
	(1)	(2)
Years 1980-83	-0.814*	0.355
	(0.384)	(0.223)
Years 1984-86	-0.804	-0.032
	(0.412)	(0.171)
Years 1987-89	--	--
Years 1990-92	0.327	0.385*
	(0.541)	(0.160)
Years 1993-95	0.675	0.376
	(0.708)	(0.333)
Years 1996-98	1.240	0.584
	(0.837)	(0.416)
Average rate in treated states in the reference period	24.1	24.1
Number of observations	37,740	37,740
R-squared	0.899	0.933
State-specific time trends		X

Notes: * denotes p<0.05, ** denotes p<0.01. Standard errors in parentheses are clustered by state. All columns include state and year fixed effects, demographic controls, and economic controls. Observations weighted by the size of the state's adult population.

Table 9: Estimated differences in SSDI beneficiaries per 1000 people in border counties treated by the Americans with Disabilities Act relative to contiguous counties in other states

	Treated states with no employment protection		Treated states with protections but no accommodations	
	Base model	Adding time trends	Base model	Adding time trends
	(1)	(2)	(3)	(4)
Years 1980-83	2.120 (1.720)	0.633 (0.797)	-0.600 (0.398)	0.415 (0.230)
Years 1984-86	5.093** (1.567)	1.401* (0.589)	-0.515 (0.429)	0.017 (0.176)
Years 1987-89	--	--	--	--
Years 1990-92	6.782** (1.934)	0.944 (0.592)	0.720 (0.556)	0.381* (0.165)
Years 1993-95	9.222** (1.962)	0.543 (1.087)	1.167 (0.719)	0.392 (0.344)
Years 1996-98	11.319** (2.028)	0.490 (1.650)	1.833* (0.847)	0.621 (0.431)
Average rate in treated states in the reference period	33.7	33.7	22.8	22.8
Number of observations	14,580	14,580	26,780	26,780
R-squared	0.876	0.929	0.894	0.932
State-specific time trends		X		X

Notes: * denotes p<0.05, ** denotes p<0.01. Standard errors in parentheses are clustered by state. All columns include state and year fixed effects, demographic controls, and economic controls. Observations weighted by the size of the state's adult population. There are 39,960 observations in the analysis.

APPENDIX

A1: Creating a consistent set of counties using census boundary changes

A consistent set of counties is based on census information on changes and data checks; key information is available here:

https://www.census.gov/geo/reference/county-changes.html.

State	New Identifier	Original FIPS	County names
Arizona	4012	4012	La Paz
		4027	Yuma
Colorado	8001	8001	Adams
		8013	Boulder
		8014	Broomfield
		8059	Jefferson
		8123	Weld
Florida	12025	12025	Dade
		12086	Miami-Dade
Montana	30031	30031	Gallatin
		30067	Park
		30113	Yellowstone
New Mexico	35006	35006	Cibola
		35061	Valencia
South Dakota	46071	46071	Jackson
		46131	Washbaugh
	46102	46102	Oglala Lakota
		46113	Shannon
Virginia	51005	51005	Alleghany
		51560	Clifton Forge city
	51015	51015	Augusta
		51790	Staunton city
		51820	Waynesboro city
	51019	51019	Bedford
		51031	Campbell
		51680	Lynchburg city
	51053	51053	Dinwiddie
		51149	Prince George
		51730	Petersburg city
	51059	51059	Fairfax
		51600	Fairfax city
	51081	51081	Greensville
		51595	Emporia city
	51083	51083	Halifax
		51780	South Boston city
	51095	51095	James City
		51830	Williamsburg city
	51123	51123	Nansemond city
		51800	Suffolk city
	51143	51143	Pittsylvania
		51590	Danville city
	51153	51153	Prince William

	51683	Manassas city
	51685	Manassas Park city
51161	51161	Roanoke
	51770	Roanoke city
51165	51165	Rockingham
	51660	Harrisonburg city
51177	51177	Spotsylvania
	51630	Fredericksburg city
51191	51191	Washington
	51520	Bristol city
51199	51199	York
	51700	Newport News city
	51735	Poquoson city