Revisiting the Employment Effects of the Americans with Disabilities Act*

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Abstract

In this paper we revisit the evidence on the employment effects of the Americans with Disabilities Act (ADA) of 1990. The existing literature assessed the impact of the policy by comparing the labor market outcomes of individuals who report limitations in their ability to work (*work limitations*) and the labor market outcomes of individuals who do not. Since the ADA applies to all disabled individuals, not just those with work limitations, we use much richer health and limitation data from the Survey of Income and Program Participation to draw a distinction between individuals with work limitations and individuals with other types of limitations that do not necessarily impact their ability to work (*functional limitations*). Consistently with the literature, over a longer sample period than used in past work, we find that the ADA has had a *negative* effect on the employment and wages of individuals with work limitations. However, we find that the policy has had a substantial and significant *positive* effect on the employment of individuals with physical or mental limitations that are not work-impacting, even when severe, with virtually no effect on their wages. To interpret this evidence, we develop a search and matching model of the labor market in which a worker's productivity and value of non-market time varies with a worker's disability status and firms face different costs to employ, accommodate, and separate from different types of workers, with and without disabilities. We then use the model to evaluate the heterogeneous impacts of the policy on the employment and wages of work disabled and non-work disabled workers, to examine the relative importance of the different components of the policy on these outcomes, and to compare alternative designs of it.

Keywords: ADA, Disability, Employment, Unemployment, Wages, Search and Matching, Structural Estimation

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1 Introduction

The Americans with Disabilities Act (ADA), signed into law on July 26, 1990, was intended to improve the social and economic conditions of individuals affected by disabilities. To this purpose, the Act was designed to grant individuals with disabilities civil rights protection against discrimination in all areas of public life, it required firms to provide reasonable accommodation to make work possible for disabled workers, and offered tax incentives for firms to encourage their employment.[1] One of the stated goals of the ADA was to promote the employment of individuals with a disability, defined as a physical or mental impairment that limits substantially one or more major life activities, including (but not limited to) working. This definition implies that the ADA protects not only individuals who are work-disabled, but also those who have other impairments that may limit some daily living activity without necessarily preventing work. The difference between having a medical condition and preserving a capacity for work is key for understanding the operation of social insurance or welfare programs that provide insurance to individuals with work disabilities, such as Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI).

After the introduction of the ADA, a few papers have assessed its impact on the employment of workers with disabilities. Despite the stated goal of the policy, the consensus is that the ADA has had a *negative* effect on the employment of disabled workers. Two seminal papers in this area, Acemoglu and Angrist (2001) and DeLeire (2000), define as work disabled those who self-report to have a condition that "limits the type or amount of work" they can do.[2] The employment performance of this treatment group is then benchmarked against that of the control group of individuals who answer this question in the negative. Both papers conclude that the employment of individuals with work disabilities has declined after the implementation of the ADA. One interpretation of this finding is that the ADA has disincentivized firms from hiring workers with disabilities both because of the current costs it imposes—the cost of providing them with reasonable work accommodations—and the expectation of the future costs that the policy may entail—related to potential anti-discrimination litigation. Moreover, the absence of an offsetting decline in wages due to the equal-pay provision of the ADA, namely, its no-discrimination requirement, may have

[1] The accommodation requirement of the policy is that employers assist or perform changes to a job position or workplace to enable an employee affected by disability to perform the required duties. The law prescribes that the accommodation be *reasonable* in that it does not pose *undue hardship* on an employer.

[2] This question is available in many surveys with remarkably similar wording: "*Do you have a health problem or disability which prevents you from working or which limits the kind or amount of work you can do?*" (CPS); "*Do you have any impairment or health problem that limits the kind or amount of paid work you could do?*" (HRS); "*Do you have any physical or nervous condition that limits the type of work or the amount of work you can do?*" (PSID); and "*Because of a physical, mental, or emotional problem, are you prevented from working?*" (SIPP).

compounded these negative employment effects.[3]

In this paper, we revisit the existing evidence on the employment effects of the ADA. Our first contribution is empirical, and is motivated by the observation that many individuals with disabilities are protected by the ADA, including those who are not necessary work-disabled. As a result, the ADA may in principle have encouraged the employment of non-work disabled individuals while discouraging the employment of individuals with work-related disabilities.[4] To make this distinction precise, we use detailed questions about the type and extent of disabilities that an individual experiences contained in the Survey of Income and Program Participation (SIPP). This allows us to go beyond the binary classification (disabled vs not disabled) used in previous work.

In particular, our treatment sample includes both individuals who report limitations to their ability to work (*work limitations*) as well as individuals who report other types of limitations (*functional limitations*) caused by a disability. The reason for this distinction is that –as noted above – *all* individuals with disabilities receive protection under the ADA, not just those with disabilities that limit work. Those with non-work disabilities constitute a separate treatment group, whose employment and wage response to the ADA has received little attention thus far. Consistently with the findings of Acemoglu and Angrist (2001) and others, but expanding their analysis to a much longer period, we estimate that the ADA has had overall a *negative* effect on the employment and wages of individuals with work-related disabilities. However, we also find that the policy has had a substantial and significant positive effect on the employment of individuals affected by physical and mental limitations that are not work-related, even if severe, with no discernible effects on their wages. The positive employment effect is similar for men and women. From now on, we refer to the two groups as work-disabled and non-work-disabled individuals, respectively.

We next develop a search and matching model of the labor market to interpret this evidence. In the model, a worker's productivity and value of non-market time depends on the worker's disability status –whether the worker is work disabled or non-work disabled– and firms face different costs to employ, accommodate, and separate from the different worker types. An intuition for the positive effect of the ADA on the employment of certain groups of disabled workers is as follows. In the presence of frictions to the matching between workers and firms, any costs of employment for firms that the ADA imposes imply that firms are less likely to *hire* workers but, conditional on employment, also less likely to *fire* them. For reasonable configurations of primitives and costs, the second effect dominates the first and the ADA can thus lead to an increase in employment for certain groups of disabled workers, especially those whose

[3]For a summary of the literature, see BLS (2008).

[4]Kruse and Schur (2003) make a similar point, and use the richness of the SIPP (for the 1990-94 period only) to look at the impact of the ADA on individuals with different type of disabilities, with findings that align qualitatively with ours.

accommodation is relatively inexpensive.

Relative to the existing literature, we view our contribution as threefold. First, we uncover novel evidence on the heterogeneous impact of the ADA on different groups of disabled workers by using much larger and richer micro panel data from the SIPP. Second, we interpret the impact of the ADA on the employment and wages of different groups of disabled workers through the lenses of a model that takes into account explicitly firms' incentives to create jobs and hire workers and workers' incentives to become employed in the presence and in the absence of the policy. Third, we evaluate the impact of alternative designs of the ADA and shed light on its complementarities with existing policies (in progress).

2 Institutional Background and Data

In this section, we describe the policy and the data we use to measure its impact.

2.1 Main Features of ADA

The stated goal of the ADA, signed into law on July 26, 1990, was to remove "[b]arriers to employment, transportation, public accommodations, public services, and telecommunications" that "have undermined efforts by individuals with disabilities to receive an education, become employed, and be contributing members of society"; for a reference, see `https://adata.org/publication/ADA-faq-booklet`. The ADA was later complemented by the Americans with Disabilities Act Amendments Act (ADAAA) of 2008, which was signed into law on September 25, 2008 and became effective on January 1, 2009.[5] The ADA consists of three main components, which we describe next.

No Discrimination. The ADA prohibits discrimination against individuals with disabilities in all areas of public life. The purpose of the law is to ensure that individuals with disabilities are granted the same rights and opportunities as non-disabled individuals. It extends to individuals with disabilities the same type of civil rights protections given to those provided on the basis of race, color, sex, national origin, age, and religion. It guarantees equal opportunity for individuals with disabilities in public accommodations, schooling, employment, transportation, state and local government services, and telecommunications. Key features of these protections are "equal pay" provisions, that is, the prescription of "equal pay for equal work," and the requirement of no discrimination against the disabled in terms of wage determination, hiring, and firing.

[5]The ADAAA made significant changes to the definition of disability (broadening it) in response to a number of decisions by the Supreme Court that had interpreted the original text of the ADA in a very restrictive manner.

Accommodation. The ADA requires firms to make it possible for individuals with disabilities to work. Specifically, firms need to provide reasonable accommodations to job applicants and employees with disabilities, for instance, by making existing facilities accessible, providing part-time or modified work schedules, acquiring or modifying existing equipment, changing tests, training materials, or policies, and providing qualified readers or interpreters. The purpose of these modifications is to grant individuals with disabilities an equal opportunity not only to become employed, but also to successfully perform their job tasks to the same extent as individuals without disabilities. Yet, employers do not have an obligation to provide any such accommodation if it imposes an "undue hardship", defined as an "action requiring significant difficulty or expense" – a concept that accounts for the nature and cost of the accommodation in relation to the size, resources, nature, and structure of a firm's operation.[6]

Tax Incentives. The ADA prescribes tax incentives for firms to encourage the employment of individuals with disabilities and promote the accessibility of public accommodations. To assist firms with complying with the ADA, Section 44 of the IRS Code allows a tax credit for small businesses and Section 190 a tax deduction for all businesses. The tax credit is available to businesses with total revenues of $1,000,000 or less in the previous tax year or 30 or fewer full-time employees. This credit can cover 50% of the eligible access expenditures in a year up to $10,250, for a maximum tax credit of $5,000. The tax credit can be used to offset the cost of undertaking barrier removal and alterations to improve accessibility, providing accessible reading formats such as Braille, large print and audio tape, making available a sign language interpreter or a reader for customers or employees, and for purchasing certain adaptive equipment. The tax deduction is available to all businesses with a maximum deduction of $15,000 per year. The tax deduction can be claimed for expenses incurred in barrier removal and alterations.

2.2 SIPP: Overview

The SIPP is a longitudinal survey that has been conducted by the Census Bureau since 1984. The survey consists of a representative sample of households that are interviewed every four months, with everyone in the household 15 years of age or older responding.[7] SIPP data are organized into distinct *panels*, which take place over several *waves*.[8] Over the years there have been substantial changes to the design of the survey. For instance, pre-1996 panels were overlapping (to improve cross-section precision), so there may be contemporaneous interviews from different panels. See Table A3 in the Appendix for more details about

[6] For more details, see the information provided by the ADA National Network Information, Guidance, and Training on the Americans with Disabilities Act.

[7] After 1996 there is an oversampling from areas with high poverty concentration (Wittenburg and Nelson, 2006).

[8] See the third edition of the SIPP User Guide for a description of the SIPP sampling structure.

the timing of SIPP panels up to 2013.

Core vs. Topical Modules. Each SIPP wave contains two types of modules: a "Core" module, including questions that are asked each time, and one or more "Topical" modules, containing questions that vary from one wave to the next. The key Topical module we use in our baseline is the "Functional Limitations and Disability" (FLD) module.[9] We merge demographic variables from the Core module with specific disability variables from the appropriate Topical modules. The reference period may differ across modules. Core questions almost always refer to a 4-month reference period that directly precedes but does not include the month of the interview. For example, a person answering questions in October 1996 would be referring to June, July, August, and September 1996. Employment status questions follow the same rule, but reports are provided for each week of the previous 4-month period. Unlike Core questions, Topical questions vary from wave to wave and the reference period is not necessarily the preceding 4-month period. For most of the information we use from the FLD, HS, and WDH modules, we can infer from the wording of the questions that the reference period is the time of the interview. The relevant topical modules for our study are summarized in Table A2 in the Appendix. Both the sampling structure, the content of some of the key questions, and the organization of the Topical modules have changed over time, making comparability across panels challenging. A major re-organization of SIPP occurred in 1996, when the survey moved from a rotating panel structure to a non-overlapping one. There were also important changes in the wording and placement of some key questions in the questionnaire. Substantially, the most relevant ones were two: an expansion of the set of questions regarding any motor, visual, hearing, or speech impediments and a lengthening and deepening of the questions related to mental health. We comment on these issues below.

Disability Classification. A key survey question we use is the one that identifies a person with a work-related disability. Prior to 1996, the question had the same wording in the Core module and in the FLD Topical module, namely: *"Does [person] have a physical, mental, or other health condition that limits the amount or kind of work [person] can do?"*. After 1996, the wording of the question remains unchanged in the Core module, but it changes in the FLD Topical module, where it becomes: *"Does [person's] health condition prevent them from working at a job or business?"* Fewer individuals reply "yes" to the latter version of the question, and those that do are more likely to not work at all. This suggests individuals interpret the question as asking about a more severe condition ("*limit* work" versus "*prevent* work"). Although it

[9]The FLD module is not available before the 1990 panel. We attempt to reconstruct the different disability definitions before 1990 using the "Health Status and Utilization of Heath Care Services" (HS) module (available for the 1985-88 panels) and the "Work Disability History" (WDH) module (available for the 1986-88 panels). We do so by matching information on work disability from the WDH module and information on non-work disability from the HS module. See Table A2 in the Appendix for the list of questionnaires we draw from each module in each year.

may appear one should always use the Core module to measure a work disability, there are two complications: (i) before 1996 responses are only given in the first wave, and then updated only when the FLD Topical module is conducted, and (ii) after 1996 responses to the question in the Core module are given in each wave, but the placement of the question in the questionnaire is different in the first vs. subsequent waves. See the discussion in Wittenburg and Nelson (2006). To address these comparability issues, we define individuals as *work disabled* if they report a work-limiting disability in the FLD module or, after 1996, if they report a work-limiting disability in either the FLD module or the Core module (to capture the change in wording).

We classify individuals as (self-reported) non-work disabled if they report that they are *not* work-disabled (in response to the question mentioned above), but (self-report) one or more of the following conditions: (a) any limitation in the "kind or amount of work around the house" they can do; (b) at least two limitations in the ability to perform standard "activities of daily living" (for instance, taking bath or shower, dressing, eating, etc.);[10] (c) any physical or sensory functional disability (for instance, limitations to walking, seeing, hearing, talking);[11] or (d) limitations that are of mental nature due to cognitive or non-cognitive conditions.[12] We thus allocate individuals to three groups: those who report no disability, those who report a work-disability, and those who report a non-work disability only. Table 1 shows that during the period covered by our data, 13% of individuals reports some disability (either work or non-work disability, or both). Figure 1 shows that this share does not exhibit any systematic time trend.

Figure 2 zooms on the disabled population, separating between those who report a work disability (with or without a non-work disability) and those who report only a non-work disability. For the latter, we consider two definitions, the baseline one (which we use for all our main tables and figures below), and an alternative definition (which we use for some robustness analyses) that includes the mental disability questions that were added to the SIPP questionnaires starting in 1996. These question covered mental health issues such as depression and anxiety. The proportion of individuals reporting a work disability varies between 9% and 13%, with no obvious trend. In contrast, the proportion of individuals reporting a non-work disability only jumps in 1990 and it remains pretty flat after 1990. This is the year when SIPP added several new questions about medical impairments and disabilities. The "alternative" definition of non-work disability shows, as expected given the discussion above, another discrete jump in 1996 when more detailed questions about mental health disabilities were added.[13]

[10] We use this criterion because it is one used to determine eligibility for long term care insurance.

[11] This includes individuals who use hearing aids or corrective lenses as well as individuals who are "non-vocal" or "blind."

[12] This includes learning (for instance, dyslexia), developmental (for instance, autism) or intellectual disabilities, or depression or anxiety.

[13] See Adler (1992) for a discussion of the questionnaire items added with the 1990 panel and Wittenburg and Nelson (2006)

To limit the influence of questions added starting with the 1996 panel, our baseline definition of non-work disability relies only on the battery of questions available consistently since 1990 (as described above). For the pre-1990 period, some questions are available, but some are missing. The reason why we use pre-1990 data, despite the fact that there is less detail than starting in 1990, is that we have a longer pre-ADA sample period. However, it is important to acknowledge that our baseline definition is likely underestimating the share of individuals with a non-work disability: Before 1990 (before 1996) some individuals who are truly non-work disabled would be mis-classified as being not disabled because the ADL/IADL (mental health) questions included in the SIPP topical modules are not as rich as those available starting with the (1990) 1996 panel. As we shall argue below, this most likely *understates* the positive impact of the ADA on the employment of the non-work disabled. In the robustness section, we present results obtained from an expanding definition of disability that incorporates the newer (mental disability) questions.

Before moving to the formal analysis of the ADA on labor market outcomes, it should be noted that another potential effect of the ADA on behavior is that it may have made more acceptable (or less stigmatizing) for a respondent to report a disability. However, Figure 2 shows no "jump" in the reporting probabilities between 1990 and 1991 (or in the years that follow the passage of the ADA in 1990). Instead, the jumps occur (if they do) when the SIPP changes question format/richness or interview mode. In Section 3.5 we look at this issue more formally, and also consider a related issue, that is, that the characteristics of those who report a disability may have changed over time and this could result in attributing to ADA what are instead compositional effects.

2.3 SIPP: Our Sample

Our sample selection is similar to Acemoglu and Angrist (2001). In particular, we focus our analysis on men and women between the ages of 21 and 58; we define wages as total salary income across (at most) two employment jobs recorded in SIPP, and deflate them by the CPI-W (indexed at January 1990);[14] we trim weekly wages to be between $25 and $2000. Appendix A.4 displays estimates without wage trimming.

Our definition of labor force status (employed, unemployed, out of the labor force) is based on an "em-

for a detailed discussion of the 1996 panel change. Figure A1 in the Appendix provides a graphical representation of the changes in the SIPP questions we use to define a non-work disability in SIPP. Before 1990, individuals were asked a limited number of questions about whether they had difficulties with Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL). The 1990 panel added a number of additional questions about difficulties with ADL/IADL, as well as some questions about mental and functional impairments (the presence of a learning, developmental or intellectual disability), and housework limitations. As a consequence of these changes, Figure A1 shows that there are clear discontinuities in the share of respondents we classify as non-work disabled reporting each qualifying condition in 1990 and 1996. The discontinuity in 1996 is clearly due to the addition of the extra mental disability questions.

[14] We do not include self-employment and moonlighting income.

ployment status recoded" (`rmesr`) variable constructed by the Census Bureau: respondents are classified as employed if they worked at least one week in the reference month; they are unemployed if they spent some time looking or on layoff; and they are out of the labor force if neither of the previous applies.[15]

We choose to define individuals' disability status only for months covered by the respondents' retrospective questionnaire: that is, we never impute disability across periods. For this reason, our final sample only includes observations with complete, contemporaneous disability records.

Table 1 reports sample observable characteristics. It shows that respondents reporting a disability tend to be older, less likely to be white, and less likely to have completed college than non-disabled respondents. Employment is substantially higher among the non-work disabled than the work disabled, as are wages; both groups do however display substantial lower labor force participation than individuals not reporting a disability. For those who are employed, we also report information on occupation and industry. People with a work disability are less likely to be executives or professionals, and more likely to be machine operators or employed in service occupations. In terms of industry, they are less likely to be employed in manufacturing or in professional service industries. See Forte et al. (2023) for an extensive analysis of the latent characteristics that distinguish work- and non-work disabled individuals.

2.4 Evidence about Key Provisions of ADA

As mentioned above, one of the main provision of the ADA is the requirement that employers provide workers with disabilities with reasonable accommodation. Moreover, protection against discrimination implies that a disabled worker who proves discriminatory behavior by an employer can receive various forms of legal compensation for unfair dismissal. There is little evidence on the cost of these work accommodations or separation costs. To fill in this gap, and to obtain values that can be used to calibrate key parameters in the model below, we compute estimates of accommodation costs from the Job Accommodation Network (JAN) and estimates of separation costs from the Equal Employment Opportunity Commission (EEOC). We estimate average accommodation and separation costs by *condition* (that is, the health condition causing one's limitation), and then match them to SIPP respondents based on reported conditions. Because the list of conditions varies across SIPP, JAN, and EEOC, we construct a mapping between these three datasets based on the Social Security Administration's Listing of Impairments.[16] We report the mapping in

[15] We find that defining employment according to the "employment status recoded" variable yields almost exactly the same result as defining it as a respondent reporting strictly positive weeks worked in the relevant question. When performing our employment analysis in the CPS, we categorize an individual as employed if they work at least a week in a given year: due to the yearly nature of CPS, there is no shorter period relevant question. Our choice of modelling employment as discrete is different from that of Acemoglu and Angrist (2001), who use the numbers of weeks worked by an individual as continuous dependent variable.

[16] See https://www.ssa.gov/disability/professionals/bluebook/AdultListings.htm).

Appendix D.

2.4.1 Accommodation Costs: JAN Evidence

From our analysis of the JAN's website (https://askjan.org/a-to-z.cfm), we obtain lists of items that firms can purchase to accommodate workers' limitations. For each work limitation, JAN provides a list of suggested products with direct links to the products' vendors and their characteristics. For example, for workers with "operating foot control" limitations, which may make driving or operating some machines difficult, JAN identifies several remedies (such as joystick driving systems, pedal extenders, etc.) and potential vendors (Amazon, Creative Controls, etc.) where companies can check the costs of the recommended products. For example, an Auto Pedal Extender for Break and Gas on Amazon sells for $65.98. We manually visit all links provided to determine the price of each item, obtaining a list of the prices of products that firms can purchase to accommodate each limitation. We map this information into the PLI as described above. We then proceed as follows. First, for each impairment, we compute the JAN remedy cost. Second, we map these costs into SIPP respondents' impairments, namely, the reported medical conditions underlying each limitation. For each SIPP respondent, we then compute the *total* accommodation cost as the *sum* of the remedy costs for all impairments reported. We interpret the implied distribution of total accommodation costs across SIPP respondents as a measure of the distribution of the fixed costs of accommodating disability in our model, k^{FIX}. The first three columns of Table 2 display summary statistics for this distribution; Figure 3a plots the distribution. For people with a work disability the average cost of accommodation is roughly $1,700 with a standard deviation of slightly above $1,000. For the non-work disabled the average cost of accommodation is roughly half with a similar level of dispersion.

2.4.2 Separation Costs: EEOC Evidence

The ADA may have induced an increase in separation costs due to the possibility that workers bring a disability discrimination lawsuit against their employer for unlawful termination. We construct an estimate of the expected separation costs in our model, the parameter k_d^{SEP} below, separately for each disability group, as:

$$k_d^{\text{SEP}} = \Pr(\text{file}|\text{separation}) \times \Pr(\text{win}|\text{separation}, \text{file}) \times \text{Awarded amount}_d, \tag{1}$$

which is the product of the probability of filing a claim with the Equal Employment Opportunity Commission (EEOC), conditional on separating; the probability of "winning" the case brought forward conditional on separating and filing a case; and the awarded monetary benefits, which are also specific to a disability

group.

We use three sources of data to estimate the three components of the expected separation cost in (1). First, we gather evidence on the monetary cost of separations for disabled workers from the *ADA Charge Data - Monetary Benefits*, a website maintained by the EEOC. The data are compiled by the Office of Enterprise Data and Analytics from information reported via the quarterly reconciled Data Summary Reports and compiled from EEOC's Charge Data System and, from FY 2004 forward, EEOC's Integrated Mission System. For the fiscal years between 1992 and 2019, the EEOC provides the monetary benefits and the number of beneficiaries for ADA-related lawsuits by type of impairment. Monetary benefits are defined as (from https://www.eeoc.gov/statistics/definitions-terms):

> *Various types of relief secured through administrative enforcement in the resolution of a charge of discrimination that have a financial valuation.These include actual cash relief for charging parties or other aggrieved individuals such as restored pay, compensatory damages, punitive and liquidated damages, and other items such as attorney's fees, fringe benefits, and training or tuition costs. There is also prospective relief that may be included that is associated with the resolution of the charge including hiring, reinstatement, recall or other actions that result in employment for the charging party or aggrieved individuals, as well as promotions and prospective fringe benefits.*

All figures are in dollars deflated by CPI (base year 1990). The last three columns of Table 2 display these estimates. Figure 3b plots the distribution. Separation costs, when benefits are awarded in a discrimination lawsuit, can be substantial - averaging roughly $20,000 for the work disabled and $10,000 for the non-work disabled, albeit with large dispersion.

Next, we compute the probability of receiving compensation using again information from the EEOC. In particular, we calculate the share of ADA cases concluded with a "merit resolution" as summarized in tables available on the EEOC website.[17] Cases that culminated with a merit resolution are cases in which *[c]harge [are] resolved with an outcome favorable to charging party or charge with meritorious allegations. These are comprised of negotiated settlements, withdrawals with benefits, successful conciliations, and unsuccessful conciliations*. Cases that do not end up in a merit resolution culminate either in an administrative closure (no determination) or with a determination of no reasonable cause. Between 1992 and 2020, 19.8% of cases are issued a merit resolution, 20.2% a no reasonable cause verdict, and 60% result in an administrative closure.

The EEOC case tables described above contain not only the number of cases closed and their resolution, but also the number of cases opened. Under the assumption that cases opened are brought forward by (a subset of the) disabled workers experiencing a separation, we couple the number of cases opened with

[17] See, for instance, https://www.eeoc.gov/data/americans-disabilities-act-1990-ada-charges-charges-filed-eeoc-includes-concurrent-charges-0 and https://www.eeoc.gov/data/americans-disabilities-act-1990-ada-charges-charges-filed-eeoc-includes-concurrent-charges.

the number of separations estimated from SIPP to obtain an estimate of the probability of filing a case conditional on a separation, $\Pr(\text{file}|\text{separation})$. Since we do not observe separately the number of cases opened by work and non-work disabled individuals, we assume that the two groups are equally likely to file an EEOC complaint. The yearly ratio of EEOC cases opened to SIPP separations experienced by the disabled ranges between 4 and 16% in the 1992-2010 years we have SIPP information for. The ratio for the entire period is 8.2%. Let then $d = \{0, w, nd\}$ denote whether an individual is not disabled, work disabled, or non-work disabled, respectively.

We obtain k_d^{SEP} for each group using estimates for its different components, as detailed above. We estimate (from SIPP data) that the probability of separation is 0.0083 for group $d = 0$, 0.0211 for group $d = w$, and 0.0139 for group $d = n$. We assume that the probability of filing given separation is 8.2% and the probability of winning a case conditional on filing following a separation is 19.8%, which corresponds to the fraction of cases concluded with a merit resolution, as discussed above. Finally, we take estimates of awarded amounts from the figures reported in Table 2.[18]

3 The Impact of the ADA

In this section, we present our main empirical findings. First, we replicate previous findings from the literature using a longer post-reform period than used in previous work. We then look at the separate effect of ADA on individuals with work- and non-work disabilities.

3.1 Employment Effects: Replicating the Traditional Specification

The main finding of a negative effect of ADA on the employment of individuals with disabilities was found both by Acemoglu and Angrist (2001), using CPS data for the 1987-96 period, and by DeLeire (2000), using SIPP data for the 1986-95 period. Both papers use a binary work disability indicator, but do not distinguish between work- and non-work disabilities. We first replicate their main finding, then show that the negative effect of ADA on the labor market outcomes of the work-disabled is present using a much longer sample period than used in their papers. We consider a simple difference-in-difference specification

[18]Note that in calculating the probability $\Pr(\text{file}|\text{separation})$, since we do not have separate information about the filing frequency of different groups of disabled workers, we have aggregated the separations of all disabled workers in SIPP. We have also implicitly assumed that non-disabled individuals who separate never file discrimination claims with the EEOC, although, as the tables above show, individuals who are not disabled according to our classification may suffer some limitations, may receive accommodation, and may seek recourse within the EEOC. Since this group of individuals is very small (see Table 2, where 95% of individuals without disability have no EEOC benefits), we ignore them.

for the impact of ADA on employment, namely,

$$y_{it} = x'_{it}\beta_1 + \beta_2 \text{Post-ADA}_{it} + \beta_3 \text{Work Disabled}_{it} + \beta_4 \text{Post-ADA}_{it} \times \text{Work Disabled}_{it} + \varepsilon_{it}, \qquad (2)$$

where y_{it} is an indicator equal to 1 if the respondent is employed; x_{it} is a vector of demographics (age, race, education, and Census region as in Acemoglu and Angrist (2001)); the variable Work Disabled$_{it}$ takes value 1 if the respondent reports a work-disability, and 0 otherwise; the variable Post-ADA$_{it}$ takes value 1 for years after and including 1991, and 0 for 1990 and earlier years (recall that the ADA was signed into law by President Bush on 7/26/1990).

Estimates are displayed in Table 3. Column (1) reports estimates using the CPS sample for the 1987-1996 period (the same period covered by Acemoglu and Angrist (2001)); column (2) reports estimates for the SIPP, using a sample period that is as close as possible as the one of column (1) (SIPP has no data for 1995-96, so we end the SIPP sample period in 1997). Comparing columns (1) and (2) shows that we replicate very closely the basic qualitative findings of Acemoglu and Angrist (2001) using a similar post-ADA period: the work-disabled work less overall, and their employment rate in the post-ADA period declines on average by 3.5 to 5.2 percentage points. DeLeire (2000), using SIPP data for 1986-1995, finds a similar decline of 4.1 to 7.2 percentage points (depending on the specification).

The results in column (3) show that, taking a longer term view (that is, including data up to 2010), the decline in employment among the work-disabled has increased even further – to 12.9 percentage points relative to the pre-ADA period.

In Table 4, we use the same difference-in-difference specification to study the impact of the ADA on wages. In both the CPS and SIPP the effect is negative and similar in magnitude (roughly a 6 percent decline). In column (3), we use the much longer SIPP sample 1986-2010 to display the longer-term effects of the policy and find that wages have declined by approximately 11 percent.

The main issue with the regressions of Tables 3-4 is that they assume that the only group of disabled individuals who are impacted by ADA are the work-disabled. In fact, many individuals with disabilities are protected by ADA and they are not necessarily work-disabled. In the next section we thus assess the effect of the policy on two types of workers: those with work-disabilities and those with non-work disabilities (as defined in the previous section). Individuals with non-work disabilities constitute a separate treatment group whose employment response to ADA has not been studied thus far.

3.2 Employment Effects for Different Disability Groups

Here, we examine the effect of the ADA on the employment of individuals facing work and non-work disabilities by extending the approach described in the previous section.

3.2.1 Difference-in-Difference Evidence

To assess the impact of the ADA on employment, we consider an extension of specification (2) and estimate the following model

$$y_{it} = x'_{it}\beta_1 + \beta_2 \text{Post-ADA}_{it} + \sum\nolimits_{j=\{w,nw\}} \beta_3^j d_{it}^j + \sum\nolimits_{j=\{w,nw\}} \beta_4^j \left(\text{Post-ADA}_{it} \times d_{it}^j\right) + \varepsilon_{it}, \qquad (3)$$

where y_{it} is a dummy for whether the respondent worked in the period referenced by the survey; x_{it} is a vector of demographics; d_{it}^j are indicators for the type of disability reported by the respondent (work-disability, w, or non-work disability, nw), and ε_{it} is an error term. In Table 5 we report results for all respondents, and then for men and women separately.

In column (1) we first show that, controlling for demographics (age, race, education, and region), year effects, and demographics-year interaction effects, individuals with disabilities generally work less than those with no disabilities (the omitted group). The negative effect is, as expected, stronger for those who report to have a work-related disability. The effect of the ADA has disparate effects on the two groups of individuals with disabilities. On one hand, individuals with work disabilities reduce their employment in the post-ADA era. However, for individuals who report non-work disabilities only, ADA had a positive and statistically significant effect. The economic effect is also large: an increase in employment of 12 percentage points. As columns (2) and (3) show, these results are not specific to gender, and are indeed qualitatively and quantitatively similar for men and women.

3.2.2 Event-Study Evidence

Standard difference-in-difference specifications assume that the effect of the reform does not change with time. It also assumes the absence of pre-existing trends in the data. In this section we extend the difference-in-difference evidence by reporting event studies estimates. The specifications for employment is similar to those of equation (3), but we let the effect of ADA (the parameters β_4^j) vary with time.

Figure 4 reports annual-specific estimates of the impact of the ADA for the two groups of interest: work disabled (left panel) and non-work disabled (right panel). In the years preceding the passing of the ADA, the work-disabled display no specific employment rate trends. In the post-ADA period, employment declines for those with work-disabilities, with most of the effects felt after 1994 and with the decline stabilizing in

the 2000's. This is consistent with the findings from the existing literature.

For individuals with non-work disabilities, the results in the pre-reform period are harder to interpret, as there are either no clear-cut trends or –if anything – a trend opposite in sign to the one we observe in the post-ADA period, when employment increases. We discuss these issues in more detail below. The increase in employment for the non-work disabled starts right after ADA and plateaus after 1994. For this group of disabled workers, the ADA is associated with roughly a 12 p.p. increase in the probability of working after 1990. In Appendix B, Figures A4 and A5 display the results for men and women separately. The results are not driven by a specific gender group.

To summarize, the event-study analysis confirms that the policy has had widely heterogeneous effects on the employment of workers with disabilities – a *negative* effect for workers whose disability impact the ability to work but a robustly *positive* one for workers with disabilities that, while affecting their daily living activities, are not impacting the ability to work.

One concern in interpreting the event-study analyses is that the changes we attribute to the ADA are in fact caused by factors other than the policy. As common practice in the event-study literature, we look at the effects estimated before the introduction of the ADA for evidence of systematic changes in the differences between disabled and non-disabled that pre-date 1991. As evident from Figure 4, a handful of the pre-1991 employment effects we estimate are statistically different from zero. For example, for the work disabled, employment is statistically significantly 3 percentage point lower than in the baseline in 1988. For the non-work disabled, employment in 1988 and 1989 is around 10 percentage point lower and 5 percent higher in 1990 relative to the 1991 baseline (and all these effects are significant at 5 percent confidence level).

We do not believe these concerns invalidate our main findings of positive employment effects for the non-work disabled and negative employment effects for the work disabled. First, given the precision with which pre-trends are estimated, for the work disabled we are unable to reject the joint null of no pre-existing trends. Second, for the non-work disabled there is no systematic pattern, and the changes in the way non-work disabled are classified in SIPP (discussed above) may be responsible for some of the deviations from the null of no pre-trends. Finally, and perhaps more importantly, the presence of statistically significant pre-trends would be concerning if ADA simply sanctioned changes in the employment of individuals with disabilities that were already present before the formal, actual passing of the reform. To check this, we tested whether the post-ADA effects we estimate for each disability group are of the same sign as the estimated pre-ADA effects. To address these concerns, we follow Freyaldenhoven et al. (2021) and estimate a linear trend based on the pre-ADA event-study estimates, which we then extrapolate and subtract from event-study estimates. The result is displayed in Figure 5: the estimated effects change, but the results are

still significant.

3.2.3 Job Creation and Job Destruction

In general, a decrease in employment may be due to a decline in job finding rates or an increase in job separation rates (and *vice versa* for an increase in employment). The question is thus whether ADA affected the nature of transitions across labor market status differently for the three disability groups. Here we make use of the panel nature of the data to investigate the source of changes in employment. We do not distinguish between voluntary and involuntary separations.[19] As Tables 6 and 7 show, the *decrease* in employment for the work disabled is coming both from more job separation and less job finding (relative to the control group of individuals without disabilities). The opposite is true for individuals with non-work disabilities: in the post-ADA period their employment increases both because the job separation rate slows down and their job finding rate increases. For both groups the changes in job separation are larger in magnitude than the changes in job finding. The model we propose in Section 4 will account for the different employment paths of the different group of disabled workers post-ADA precisely through these channels.

3.3 Wage Effects for Different Disability Groups

Finally, we examine the effect of the ADA on the wages of individuals with work and non-work disabilities using the same approach used for employment, that is, starting with a simple difference in difference analysis and moving then to an event studies specification.

3.3.1 Difference-in-Difference Evidence

To assess the impact of the ADA on wages, we start by estimating the following difference-in-difference specification

$$\log w_{it} = x_{it}'\gamma_1 + \gamma_2 \text{Post-ADA}_{it} + \sum\nolimits_{j=\{w,nw\}} \gamma_3^j d_{it}^j + \sum\nolimits_{j=\{w,nw\}} \gamma_4^j \left(\text{Post-ADA}_{it} \times d_{it}^j\right) + \epsilon_{it} \qquad (4)$$

where w_{it} is the weekly wages (computed as the log of monthly wages divided by weeks worked) deflated by the 1990 CPI-W. Table 8 reports the estimates. Our analysis of SIPP data confirms the previous finding of negative wage effects of the ADA for workers with limitations (broadly defined). In particular, we find that individuals with work-related disabilities experience not only a decline in employment but also a decline in their wages. This may reflect composition effects—those who left employment may have been the most productive in the work-disabled group (or may be those whose accommodation costs may have

[19] See Appendix C for a comparison of the transition rates we estimate with those found in Menzio et al. (2016).

been particularly high for firms to meet). On the other hand, for the non-work disabled group the increase in employment rates is accompanied by no significant changes in their average wages.

3.3.2 Event-Study Evidence

As done with employment, we extend the difference-in-difference evidence by reporting event studies estimates of the ADA on wages. The specifications for wage effects is similar to those of equation (4), but we let the effect of ADA (γ_4^j) vary with time. Figure 6 reports the estimates and associated 95% confidence intervals for the pooled men/women sample. Figures A6 and A7 display estimates separately by gender. Consistent with the previous literature, we estimate negative wage effects for the disabled in the post-ADA period. In particular, individuals with work disability suffer substantial wage losses in the post-ADA period (a 25 percent decline through 2010, see the left panel of Figure 6). However, the estimated impact of the ADA on the wages of the non work-disabled is – economically and statistically – indistinguishable from zero.

3.4 Recipiency Effects for Different Disability Groups

Here, we examine the effect of the ADA on Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI) recipiency by individuals with work and non-work disabilities. In principle, SIPP only contains a question concerning Old-Age, Survivors, and Disability Insurance (OASDI) income receipt that allows for consistent analysis over multiple panels. We record as SSDI recipients those who receive OASDI and report disability as one of the (up to) two reasons provided for OASDI receipt. The differences in the two definitions are displayed in Figure 7.[20]

3.4.1 Time Series Evidence

Figure 7 displays the share of respondents receiving OASDI and/or SSI for each disability group across the years. As expected, disabled respondents are substantially more likely to receive OASDI and/or SSI than the non-disabled, though it is important to note the recipiency rate of the latter is not 0%.

3.4.2 Event-Study Evidence

As done with employment and wages, in this section we extend the difference-in-difference evidence by reporting event studies estimates of the ADA on SSDI/SSI recipiency and OASDI/SSI recipiency. Figures 8 and 9 report the estimates and associated 95% confidence intervals for the pooled men/women sample.

[20] OASDI and SSI recipiency (state and federal) are only properly recorded from 1990 onwards; before then, extremely few respondents report receiving OASDI.

The panels show that recipiency increases substantially among the work disabled and decreases among the non-work disabled. In particular, both sign and magnitude of the effects in Figure 9 are specular to those shown in Figure 4 for employment.

3.5 Robustness of Event Studies

Here we discuss the robustness of our results to expanding the definition of disability over time and to changes in the composition of the groups of disabled individuals.

Expanding Disability Definition. As discussed in Section 2.2, before the 1996 Panel mental health questions in the FLD are limited to the presence of a learning, developmental or intellectual disability. The 1996 survey introduced questions about depression, anxiety and other mental health conditions. To make sure that the results are not driven by the expansion of the concept of mental disability, we include in our sample only mental disorders that are recorded consistently over the years. In this subsection we instead consider an expanding definition of disability that includes newer questions. The event-study analyses for employment and wages are presented in Figures 10 and A3, respectively. Qualitatively the results do not change, although estimates of the effect of the ADA for the non-work disabled are slightly smaller.

Compositional Changes. A concern about our analysis is that the ADA effect we estimate reflects changes in the characteristics of those who report a disability, rather than a genuine change in the labor market outcomes experienced by the disabled. For example, the employment increase among the non-work disabled could be due to an increase in the number of highly educated workers reporting a non-work disability, rather than a genuine improvement in the labor market conditions for the non-work disabled. To address these concerns over (observable) compositional changes driving our estimates, we conduct the following exercise. We define the share of respondents in disability group d ($d \in \{0, w, nw\}$, respectively for individuals with no disability, a work disability, and a non-work disability) and year t as $s_{dt} = \sum_{g=1}^{G} s_{dgt} s_{gt}$, where $g = \{1, \ldots, G\}$ indexes a particular intersection of observable characteristics (such as college educated white men in a certain age group, etc.), s_{dgt} is the share of respondents in group g reporting disability status d in year t and s_{gt} is the share of respondents in group g in year t. We then compare the observed s_{dt} to two counterfactuals. In the first, we estimate group shares pooling data for all years, that is,

$$\bar{s}_{dt} = \sum_{g=1}^{G} s_{dgt} s_{g}, \tag{5}$$

whereas in the second we fix the group shares to their 1990 estimates, namely

$$\tilde{s}_{dt} = \sum_{g=1}^{G} s_{dgt} s_{g1990}. \tag{6}$$

The results of this exercise are displayed in Figure 12. Groups are defined by the interaction between age, education, race, and other demographic characteristics used in our event-study specifications. The exercise reveals that shifts in observable characteristics are unlikely to be responsible for the changes in the shares of individuals with work or non-work disability that we observe in the data. For example, the increase in the share of non-work disabled in 1997, when SIPP enlarged the set of mental conditions that qualify an individual as non-work disabled, would have happened even if we had kept the group shares to the 1990 value.

Size of Each Disability Group. Interestingly, the share of individuals reporting a work disability is rather stable over time, once we control for the same standard demographic characteristics as in our event-study exercises, as shown in panel (a) of Figure 13. However, as mentioned above, a subtle effect of the ADA may have been that of reducing the stigma of reporting a non-work disability. Suppose that before the passage of the ADA many of the individuals with a non-work disability who feel stigmatized from reporting a disability are employed. In the post-ADA period, these individual continue to work but now also report a non-work disability. Hence, we could find that the ADA shifts the employment of those with a non-work disability simply because more workers now report to be non-work-disabled. We find no evidence of such increase, as shown in panel (b) of Figure 13: if anything, the share of respondents reporting work disability decreases slightly. On the other hand, panel (c) shows such an increase would mechanically appear if we were to use a definition of disability encompassing the 1996 survey expansion.

4 A Model of the Impact of the ADA

In this section, we propose a search and matching model of the labor market that we use to interpret the findings on the impact of the ADA on employment and wages discussed above. The model has three purposes. First, it allows us to shed light on how the ADA modifies firms' incentives to create jobs and employ workers as well as workers' incentives to look for work and become employed, as a function of the type of disability they experience. Second, the model helps us understand how the different provisions of the policy, which we can isolate in our "laboratory economy", have contributed to the starkly different employment and wage effects of the policy on work and non-work disabled workers. Third, this framework enables us to evaluate alternative design of the policy and the degree to which it complements other existing

policies, such unemployment benefits, that are not contingent on workers' disability status (in progress).

A brief overview of the model is as follows. We consider an economy populated by a large number of workers N. At any point in time, there are E_t employed and U_t unemployed workers, with $\mathrm{N} = \mathrm{E}_t + \mathrm{U}_t$. Every period, unemployed workers become employed with job finding probability f_t and employed workers become unemployed with separation probability s_t. The number of employed workers evolves according to $\mathrm{E}_{t+1} = (1 - s_t)\mathrm{E}_t + f_t\mathrm{U}_t$. For given f and s the process converges to a stationary level of employment with $\mathrm{E}_{t+1} = \mathrm{E}_t = \mathrm{E}$. The stationary employment rate is

$$\frac{\mathrm{E}}{\mathrm{N}} = \frac{f}{f+s},$$

which is increasing in the job finding probability f, decreasing in the job separation probability s, and remains unchanged if both probabilities are scaled by a constant. Intuitively, we can understand the differential employment effects of the ADA on work and non-work disabled individuals by examining its differential effects on the job finding and job separation probabilities of these two groups of workers. We do so formally in the next section, where we incorporate disability and the ADA into an otherwise standard labor search model of the labor market (Mortensen and Pissarides, 1994). In such a framework, the job finding and separation probabilities are endogenous to firms' and workers' decisions and will respond to the ADA policy. The relative changes in these probabilities will differ by the net cost of accommodation, which may be different for the work disabled and non-work disabled, as we argue is consistent with the data.

4.1 Environment

Time is discrete and continues forever. All agents discount the future with discount factor $\beta \in (0, 1)$. Workers are heterogeneous in terms of their disability type d. Types may differ along all dimensions including, for example, productive efficiency in the absence of accommodation, the distribution of accommodation costs, shocks to match productivity, and the opportunity cost of working. We normalize the efficiency units of labor for a non-disabled worker as $e_{\mathrm{ND}} = 1$. Let N_d denote the measure of type-d workers in the population with the total measure of workers normalized to one. Workers may be employed or unemployed and we denote by E_d and U_d the measure of type-d employed and unemployed workers, with $\mathrm{E}_d + \mathrm{U}_d = \mathrm{N}_d$. Workers order period flows according to $U = \mathbb{E}_0 \sum_{t=0}^{\infty} y_t$, where the flow is equal to the value of non-market time z when unemployed and the wage w when employed. Wages when employed are the result of continuous Nash bargaining between the worker and firm, with worker bargaining power γ.

There is a measure $\mathrm{M} > 1$ of identical firms. Firms post vacancies, at flow cost k, in submarkets that

are indexed by disability type d. Disability submarkets are distinguished by the fixed upfront and flow costs of accommodation k^{FIX} and k^{FLOW} associated with accommodating disability type d, and potentially differ in all other parameters too.[21]

There is free entry of firms into each submarket. Within a submarket meetings between workers and firms are governed by a constant returns to scale meeting function $m(v,u)$ which governs the number of meetings as a function of the number of vacancies v, and the number of unemployed workers u, in the submarket. Let $\theta = v/u$ be the tightness in the submarket. The job contact probability for a worker is then $p(\theta) = m(v,u)/u$ (the number of meetings per unemployed worker). The meeting probability for a firm posting a vacancy is $q(\theta) = m(v,u)/v = p(\theta)/\theta$ (the number of meetings per vacancy).

Upon meeting, match productivity $\varepsilon \in [0, \overline{\varepsilon}]$ and the cost of accommodation $k^{\text{FIX}} \in [0, \overline{k}^{\text{FIX}}]$ are realized as a draws from the distributions F and H, respectively. Continuing matches are subject to shocks to match productivity with arrival probability δ each period, resulting in a new match productivity $\varepsilon \in [0, \overline{\varepsilon}]$ drawn from the distribution G.

Accommodation is assumed to fully restore a worker's efficiency units of labor from e to 1, namely, a firm can decide either to accommodate a disabled worker, in which case the net revenue generated by the worker is $\varepsilon - k^{\text{FLOW}}$, or to not accommodate the worker, in which case the revenue generated by the worker is εe, where e reflects the loss of a worker's efficiency units due to disability in the absence of accommodation. Intuitively, an alternative setup would account for the possibility that accommodation partially restores a worker's efficiency units—rather than completely restoring it, as we assume. For instance, accommodating a disabled worker at cost $\tilde{k}^{\text{FLOW}}$ could restore the efficiency units of a disabled worker up to $\varepsilon\tilde{e}$, with $\tilde{e} < 1$. Notice, however, that in the absence of any direct information on either $\tilde{e}$ or $\tilde{k}^{\text{FLOW}}$, our formulation retains the flexibility of allowing for any possible value of net revenue from accommodation with a parsimonious one-parameter representation of the underlying technology.

Let V be the value to a firm of posting a vacancy. Firms pay a flow cost k to maintain vacancies. Let $J^1(\varepsilon)$ be the value to a firm when providing accommodations, and $J^0(\varepsilon)$ be the value without accommodation, when match productivity is ε. In the absence of the ADA a firm has the choice of whether or not to accommodate a disabled worker when they initially meet. The decision to accommodate a worker incurs the fixed upfront cost k^{FIX}. An unaccommodated job has net output εe per period, while an accommodated job has net output $\varepsilon - k^{\text{FLOW}}$. Let U be the value to an unemployed worker and let $E^0(\varepsilon)$ and $E^1(\varepsilon)$ be the

[21] We leave the heterogeneity of parameters by market disability type implicit in the following equations. Although all parameters could differ by disability type, we primarily focus on the heterogeneity in worker efficiency units when workers are not accommodated, the distributions of accommodation costs, the distribution of match productivity shocks, and the value of non-market time in the quantitative section below.

values to a worker of an unaccommodated and accommodated match with productivity ε respectively. The dependence of values V, J, U and E on disability status d is left implicit, they will differ across submarkets. Define ε^0 as the match productivity threshold below which the value of production is below the value of a vacancy when not accommodating and similarly ε^1 as the threshold when accommodating the worker.

4.2 Baseline Economy Without the ADA

In an economy without the ADA, firms' steady state values are

$$
\begin{aligned}
V &= -k + \beta \left(q(\theta) \int_{\varepsilon} \int_{k^{\text{FIX}}} \max \left\{ V, J^0(\varepsilon), J^1(\varepsilon) - k^{\text{FIX}} \right\} dH(k^{\text{FIX}})\, dF(\varepsilon) + (1 - q(\theta))V \right), \\
J^0(\varepsilon) &= \varepsilon e - w^0(\varepsilon) + \beta \left(\delta \left[\int_{\varepsilon^0}^{\overline{\varepsilon}} J^0(x) dG(x) + G(\varepsilon^0)V \right] + (1 - \delta)J^0(\varepsilon) \right), \\
J^1(\varepsilon) &= \varepsilon - k^{\text{FLOW}} - w^1(\varepsilon) + \beta \left(\delta \left[\int_{\varepsilon^1}^{\overline{\varepsilon}} J^1(x) dG(x) + G(\varepsilon^1)V \right] + (1 - \delta)J^1(\varepsilon) \right).
\end{aligned}
$$

The value of a vacancy V comprises the flow cost of posting a vacancy plus the discounted expected value of the posting, with the equilibrium probability of meeting an unemployed worker $q(\theta)$. The expected value of a meeting is calculated by taking the maximum over remaining vacant, hiring the worker without accommodation and hiring the worker with accommodation, for all possible combinations of match productivity ε and upfront accommodation costs k^{FIX} .

The value of an unaccommodated match to a firm $J^0(\varepsilon)$ comprises the flow profit $\varepsilon e - w^0(\varepsilon)$, where unaccommodated efficiency units e are less than 1, and the discounted expected continuation value. With probability δ a new match productivity is drawn from G. Productivity draws below the threshold ε^0 result in match termination, where ε^0 is determined by $J^0(\varepsilon^0) = V$. With probability $1 - \delta$ match productivity remains unchanged and the continuation value is $J^0(\varepsilon)$. Similarly, the value of an accommodated match to a firm $J^1(\varepsilon)$ comprises the flow profit $\varepsilon - k^{\text{FLOW}} - w^1(\varepsilon)$, where accommodation restores efficiency units to 1 at the flow cost k^{FLOW}. The match termination threshold ε^1 is determined by $J^1(\varepsilon^1) = V$. Generically, the endogenous wages $w^j(\varepsilon)$, and match termination thresholds ε^j will differ for accommodated and unaccommodated matches.

Similarly, workers' steady state values are given by

$$
\begin{aligned}
U &= z + \beta \left(p(\theta) \int_{\varepsilon} \int_{k^{\text{FIX}}} \max \left\{ U, E(\varepsilon, k^{\text{FIX}}) \right\} dH(k^{\text{FIX}})\, dF(\varepsilon) + (1 - p(\theta)U \right), \\
E^0(\varepsilon) &= w^0(\varepsilon) + \beta \left(\delta \left[\int_{\varepsilon^0}^{\overline{\varepsilon}} \max\{U, E^0(x)\} dG(x) + G(\varepsilon^0)U \right] + (1 - \delta)E^0(\varepsilon) \right), \\
E^1(\varepsilon) &= w^1(\varepsilon) + \beta \left(\delta \left[\int_{\varepsilon^1}^{\overline{\varepsilon}} \max\{U, E^1(x)\} dG(x) + G(\varepsilon^1)U \right] + (1 - \delta)E^1(\varepsilon) \right),
\end{aligned}
$$

where we define

$$E(\varepsilon, k^{\text{FIX}}) = \begin{cases} E^0(\varepsilon) & \text{if } J^0(\varepsilon) \geq J^1(\varepsilon) - k^{\text{FIX}} \text{ and } J^0(\varepsilon) \geq V \\ E^1(\varepsilon) & \text{if } J^0(\varepsilon) < J^1(\varepsilon) - k^{\text{FIX}} \text{ and } J^1(\varepsilon) - k^{\text{FIX}} \geq V \\ 0 & \text{otherwise.} \end{cases}$$

The value U to an unemployed worker comprises the value of non-market time z and the discounted expected continuation value. With equilibrium probability $p(\theta)$ the worker contacts a vacancy, draws ε and k^{FIX}, and chooses whether to remain unemployed or accept employment valued at $E(\varepsilon, k^{\text{FIX}})$, where the job may be either accommodated or unaccommodated, depending of the firms decision above. The value of employment $E^j(\varepsilon)$, where j is equal to 0 for an unaccommodated job and 1 for an accommodated job, comprises the per period wage $w^j(\varepsilon)$ and the discounted expected continuation value. With probability δ a new match shock is drawn from G. For new match draws ε' above the threshold set by the firm ε^j the worker has the option to continue employment at the new value $E^j(\varepsilon')$ or quit to unemployment and receive value U. For match draws below ε^j the firm chooses to terminate the match and the worker becomes unemployed. With probability $1-\delta$ the match continues at the previous productivity and the worker continuation value is $E^j(\varepsilon)$.

Free entry into each submarket drives the value of a vacancy V to zero as the number of vacancies adjusts, and determines disability specific market tightness θ, and hence the meeting probability for unemployed workers $p(\theta)$. The market specific equilibrium job separation rate is given by $\delta G(\varepsilon^j)$, for $j \in \{0, 1\}$. It is easy to verify that, in the baseline economy, all value functions can be expressed in terms of the total match surplus $S^j(\varepsilon) = J^j(\varepsilon) + E^j(\varepsilon) - U$, and that the separation thresholds ε^j are determined by $S^j(\varepsilon^j) = 0$, for accommodation status $j \in \{0, 1\}$. We can then work with the reduced set of equations:

$$\begin{aligned} 0 &= -k + \beta q(\theta) \int_{\varepsilon} \int_{k^{\text{FIX}}} \max\left\{0, (1-\gamma)S^0(\varepsilon), (1-\gamma)S^1(\varepsilon) - k^{\text{FIX}}\right\} dH(k^{\text{FIX}})\, dF(\varepsilon), \\ S^0(\varepsilon) &= \varepsilon e + \beta \left(\delta \int_{\varepsilon^0}^{\overline{\varepsilon}} S^0(x) dG(x) + (1-\delta) S^0(\varepsilon) \right) - (1-\beta)U, \\ S^1(\varepsilon) &= \varepsilon - k^{\text{FLOW}} + \beta \left(\delta \int_{\varepsilon^1}^{\overline{\varepsilon}} S^1(x) dG(x) + (1-\delta) S^1(\varepsilon) \right) - (1-\beta)U, \end{aligned}$$

where

$$(1-\beta)U = z + \beta p(\theta) \int_{\varepsilon} \int_{k^{\text{FIX}}} \gamma S(\varepsilon, k^{\text{FIX}}) dH(k^{\text{FIX}})\, dG(\varepsilon),$$

and

$$S(\varepsilon, k^{\text{FIX}}) = \begin{cases} S^0(\varepsilon) & \text{if } (1-\gamma)S^0(\varepsilon) \geq (1-\gamma)S^1(\varepsilon) - k^{\text{FIX}} \text{ and } S^0(\varepsilon) \geq 0, \\ S^1(\varepsilon) & \text{if } (1-\gamma)S^0(\varepsilon) < (1-\gamma)S^1(\varepsilon) - k^{\text{FIX}} \text{ and } (1-\gamma)S^1(\varepsilon) - k^{\text{FIX}} \geq 0, \\ 0 & \text{otherwise.} \end{cases}$$

The wage is given by continuous Nash bargaining with solutions

$$w^0(\varepsilon) = \gamma\varepsilon e + (1-\gamma)(1-\beta)U \text{ and } w^1(\varepsilon) = \gamma(\varepsilon - k^{\text{FLOW}}) + (1-\gamma)(1-\beta)U.$$

Note that the upfront cost of accommodation k^{FIX} is sunk at the time of hiring and therefore it does not affect the bargained wage. It does, however, affect both the expected value of creating a vacancy and the relative value of accommodating verses not accommodating the worker. As a results, it has a direct effect on job creation and the share of matches that the firms choose to accommodate.

In a steady state equilibrium the flows into and out of employment states are equalized within each submarket,

$$\delta G(\varepsilon^0)\text{E}^0 = p(\theta)\int_{\varepsilon|S^0(\varepsilon)\geq 0}\int_{k^{\text{FIX}}|k^{\text{FIX}}\geq(1-\gamma)(S^1(\varepsilon)-S^0(\varepsilon))} h(k^{\text{FIX}})f(\varepsilon)dk^{\text{FIX}}d\varepsilon\left(\text{N}-\text{E}^0-\text{E}^1\right),$$
$$\delta G(\varepsilon^1)\text{E}^1 = p(\theta)\int_{\varepsilon}\int_{k^{\text{FIX}}|k^{\text{FIX}}<(1-\gamma)(S^1(\varepsilon)-S^0(\varepsilon))\cap k^{\text{FIX}}<(1-\gamma)S^1(\varepsilon)} h(k^{\text{FIX}})f(\varepsilon)dk^{\text{FIX}}d\varepsilon\left(\text{N}-\text{E}^0-\text{E}^1\right),$$

which imply the following employment rate, the share of employed workers without accommodation and workers with accommodation for each submarket d:

$$\frac{\text{E}}{\text{N}} = \frac{f^0s^1+f^1s^0}{s^0s^1+f^0s^1+f^1s^0}, \quad \frac{\text{E}^0}{\text{N}} = \frac{f^0s^1}{s^0s^1+f^0s^1+f^1s^0}, \quad \frac{\text{E}^1}{\text{N}} = \frac{f^1s^0}{s^0s^1+f^0s^1+f^1s^0},$$

where $s^j = \delta G(\varepsilon^j)$, $f^0 = p(\theta)\int_{\varepsilon|S^0(\varepsilon)\geq 0}\int_{k^{\text{FIX}}|k^{\text{FIX}}\geq(1-\gamma)(S^1(\varepsilon)-S^0(\varepsilon))} h(k^{\text{FIX}})f(\varepsilon)dk^{\text{FIX}}d\varepsilon$ and $f^1 = p(\theta)\int_{\varepsilon}\int_{k^{\text{FIX}}|k^{\text{FIX}}<(1-\gamma)(S^1(\varepsilon)-S^0(\varepsilon))\cap k^{\text{FIX}}<(1-\gamma)S^1(\varepsilon)} h(k^{\text{FIX}})f(\varepsilon)dk^{\text{FIX}}d\varepsilon$.

A steady state equilibrium in the baseline economy comprises a fixed point in the surplus functions $S^j(\varepsilon)$, market tightness θ, and separation thresholds ε^j for each submarket d and accommodation $j \in \{0,1\}$. The employment rates and wages are backed out ex-post, submarket by submarket, for accommodation and non-accommodation.

4.3 Economy with the ADA

We model the ADA as involving the following four changes to the baseline economy: 1) Accommodation is mandated. All firms must pay the costs k^{FIX} and k^{FLOW} to fully accommodate disabled workers in all submarkets, unless the cost of accommodation is unreasonable. 2) Terminating a match in a disabled submarket incurs an expected cost $\mathbb{E}[k^{\text{SEP}}]$. 3) Wages may depend on match productivity ε but may not depend on disability status. All workers in matches with productivity ε must be paid the same, regardless of the cost of accommodation. 4) Accommodation costs are subsidized. Firms pay only a share ξ of the actual accommodation costs.

To model non-discrimination in wages, wages are determined in the non-disabled submarket, and taken as given in all disabled submarkets: $w(\varepsilon) = \chi w_{\text{ND}}(\varepsilon)$, where $w_{\text{ND}}(\varepsilon) = \gamma\varepsilon + (1-\gamma)(1-\beta)U_{\text{ND}}$. We introduce the parameter $\chi \in (0,1]$ to allow for the possibility of less than full compliance with equal pay requirements on the part of firms. The role of this parameter is discussed in more detail below. Note that non-discrimination on wages means the wage is disconnected from the net flow output of the match (output net of accommodation costs) and the workers' opportunity cost of working $(1-\beta)U$. As a result, positive match surplus is no longer the relevant condition for continued viability of a match at productivity ε, we require that the participation constraints of the firm and the worker, $J^{\text{ADA}}(\varepsilon) \geq -\mathbb{E}[k^s]$ and $E^{\text{ADA}}(\varepsilon) \geq U^{\text{ADA}}$ are satisfied. The idea that accommodation must be reasonable is captured by the condition $J^{\text{ADA}}(\varepsilon) - \xi k^{\text{FIX}} \geq 0$, which means the accommodation is reasonable as long as the present discounted value of the match exceeds the cost of accommodation, including the upfront fixed costs. The steady-state value functions for a filled job and an employed worker in the presence of the ADA are

$$0 = -k + \beta q(\theta) \int_{\varepsilon} \int_{k^{\text{FIX}} | \xi k^{\text{FIX}} < J^{\text{ADA}}(\varepsilon)} \left(J^{\text{ADA}}(\varepsilon) - \xi k^{\text{FIX}} \right) dH(k^{\text{FIX}})\, dF(\varepsilon),$$

$$J^{\text{ADA}}(\varepsilon) = \varepsilon - \xi k^{\text{FLOW}} - \chi w_{\text{ND}}(\varepsilon) + \beta \left(\delta \left[\int_{\varepsilon^{\text{ADA}}}^{\overline{\varepsilon}} J^{\text{ADA}}(x) dG(x) - G(\varepsilon^{\text{ADA}}) \mathbb{E}[k^{\text{SEP}}] \right] + (1-\delta) J^{\text{ADA}}(\varepsilon) \right)$$

and

$$U^{\text{ADA}} = z + \beta \left(p(\theta) \int_{\varepsilon} H(J^{\text{ADA}}(\varepsilon)/\xi) E^{\text{ADA}}(\varepsilon)\, dF(\varepsilon) + \left(1 - p(\theta) \int_{\varepsilon} H(J^{\text{ADA}}(\varepsilon)/\xi)\, dF(\varepsilon) \right) U^{\text{ADA}} \right),$$

$$E^{\text{ADA}}(\varepsilon) = \chi w_{\text{ND}}(\varepsilon) + \beta \left(\delta \left[\int_{\varepsilon^{\text{ADA}}}^{\overline{\varepsilon}} \max\{U, E^{\text{ADA}}(x)\} dG(x) + G(\varepsilon^{\text{ADA}}) U^{\text{ADA}} \right] + (1-\delta) E^{\text{ADA}}(\varepsilon) \right).$$

The first equation is the value of a vacancy post ADA, where we have directly imposed the free entry condition that $V = 0$. The value of a vacancy comprises the flow cost of maintaining the vacancy k and the discounted expected continuation value. With equilibrium probability $q(\theta)$ the firm meets an unemployed worker. The cost to accommodate the worker k^{FIX} is drawn from the distribution H and initial match productivity ε is drawn from the distribution F. The value to a firm of forming this match is given by $J^{\text{ADA}}(\varepsilon) - \xi k^{\text{FIX}}$, where ξ is the subsidy. Matches are formed as long as this value is positive. The value of a continuing match of productivity ε is given by $J^{\text{ADA}}(\varepsilon)$. This comprises the period profit $\varepsilon - \xi k^{\text{FLOW}} - \chi w_{\text{ND}}(\varepsilon)$, and the discounted expected continuation value. Next period, with probability δ the match productivity is redrawn from G. The firm chooses whether to continue the match at the new match productivity or terminate the match and pay the expected separation cost $\mathbb{E}[k^{\text{SEP}}]$, where we assume this is a pure cost to the firm. The match termination threshold ε^{ADA} is determined by $J^{\text{ADA}}(\varepsilon^{\text{ADA}}) = -\mathbb{E}[k^{\text{SEP}}]$, where we assume that the firm is able to insure against the tail risk of very high separation costs, and

therefore cares only about the expected separation cost.

The post ADA value of unemployment U^{ADA}, comprises the period value of non-market time z and the discounted expected continuation value. Next period, with equilibrium probability $p(\theta)$ the unemployed worker contacts a vacancy. The cost of accommodation k^{FIX} is drawn, as is the initial match productivity ε. Whether the cost of accommodation is reasonable is determined by whether the expected discounted value of profits for the firm exceeds the accommodation costs given match productivity ε. $H(J^{\text{ADA}}(\varepsilon)/\xi)$ is the share of meetings with match efficiency ε such that the costs of accommodation are considered to be reasonable, taking into account the subsidy ξ. Feasible matches are valued at $E^{\text{ADA}}(\varepsilon)$ by the worker. With probability $1 - p(\theta)H(J^{\text{ADA}}(\varepsilon)/\xi)$ the worker either does not contact a vacancy or the combination of accommodation cost and match productivity mean the match is not viable from the perspective of the firm. In these cases the worker continues to be unemployed, U^{ADA}.

The value of employment at match productivity ε is given by $E^{\text{ADA}}(\varepsilon)$ and comprises the wage (which may not fully comply with the non-disable wage $w_{\text{ND}}(\varepsilon)$) and the discounted expected continuation value. Next period, with probability δ match productivity is redrawn from the distribution G. If the new match productivity is above the threshold determined by the firm, $\varepsilon^{]}\text{ADA}$, the worker has the option to quit to unemployment or continue in the match at value $E^{\text{ADA}}(\varepsilon')$. If the new productivity is below this threshold the match is terminated by the firm and the worker becomes unemployed. With probability $1 - \delta$ match productivity remains unchanged and the worker continues in the match with value $E^{\text{ADA}}(\varepsilon)$.

4.4 Quantitative Model

We discuss here the parameterization of the model, its identification, our estimation results, and a quantitative evaluation of the ADA and of potential alternative designs of it.

4.4.1 Parameterization

We calibrate the model to reproduce, for both work disabled and non-work-disabled, the pre-ADA and post-ADA employment levels (Table 5), transitions between employment and non-employment (Tables 6 and 7), wage changes (Table 8), and an estimate of the share of matches with accommodation pre-ADA, namely, Daly and Bound (1996)' estimate, based on retrospective information in the Health and Retirement Survey, that one third of disabled workers received accommodation from their employer. Specifically, we assume that work and non-work disabled individuals differ in their value of non-market time (z), efficiency units when unaccommodated (e), the stochastic processes governing match-specific productivity shocks (F and G), the distribution of fixed costs of accommodating disability ($H(k^{\text{FIXED}})$), the flow costs of accom-

modating disability (k^{FLOW}), and the distribution of the cost of match separation (k^{SEP}). For estimation we have introduce the parameter, χ, that multiplies the wage so that the wage becomes $\chi w_0(\varepsilon)$. This parameter is meant to capture possible deviations from full compliance with the requirement of no wage discrimination as well as any job reclassification, task and occupation reallocation, or any other reorganization of production or relabeling of tasks that firm may revert to in response to the ADA. As we will see below, allowing for non-compliance will be important to understand the post-ADA changes in wages.

We assume the meeting technology is given by a Cobb-Douglas function $m(u,v) = Au^{\alpha}v^{1-\alpha}$, with α set to 0.5 (Petrongolo and Pissarides, 2001) and A calibrated in the non-disabled submarket. We set workers' bargaining power to satisfy the Hosios condition, $\gamma = \alpha$, so that the non-disabled submarket has constrained efficient employment levels. We calibrate the flow cost of a vacancy in the non-disabled submarket. We calibrate the four parameters $\{z_{\text{ND}} = 0.528, \delta_{\text{ND}} = 0.0558, A = 0.246, k = 0.154\}$ to fit the four moments of the non-disabled submarket $\{z/\mathbb{E}[w] = 0.71, s_{ND} = 0.034, E_{\text{ND}} = 0.81, \theta_{\text{ND}} = 1.0\}$, with F_{ND} and G_{ND} both assumed to be uniform $[0,1]$. For the relative value of market time, we target the estimates in Hall and Milgrom (2008), separations are taken to match the average aggregate monthly separation rate from Shimer (2005),[22] the employment level is taken from Table 1, and the vacancy to unemployment rate θ is normalized to one for the non-disabled submarket. These values for A and k are also used in the disabled submarkets.

We assume that the match productivity distributions F and G are the same and we parameterize them as beta distribution, Beta(β_1,β_2).[23] Finally, we fix the subsidy for accommodation costs to 50 percent, based on the tax provisions for firms employing disabled workers discussed in Appendix E.

The distributions of upfront accommodation costs $H(k^{\text{FIX}})$ are based on the recommended accommodations from JAN and the mean termination costs $\mathbb{E}[k^{\text{SEP}}]$ are based on the monetary awards for discrimination cases filed with the U.S. Equal Employment Opportunity Commission (EEOC), both of which are discussed in detail in Section 2.4 and summarized in Table 2 and Figure 3. It is clear from the table and figure that the costs of accommodation, relative to mean wages, markedly differ between the work- and non-work-disabled populations. The distribution for the work-disabled stochastically dominates the distribution for the non-work-disabled, and the mean is more than twice as large. Similarly, termination costs are nearly double for the work disabled relative to the non-work-disabled.

The parameters to estimate are the flow accommodation cost k^{FLOW}, which is meant to capture all costs

[22] We choose to match the unconditional separation rate rather than the conditional separation rate in Table 7 so that the flows are comparable to the aggregate US economy. For the same reason, we use relative separation rates rather than differences in separation rates to pin down parameters in the disabled submarkets.

[23] In general, G may be expected to be different from F due, for example, to human capital acquired on the job. Although we are currently abstracting from this possibility, we are exploring possible alternative versions of the model that account for it.

associated with the flexible accommodation of work schedules for disabled workers; the efficiency units of unaccommodated workers e; the value of non-market time z; the arrival probability for match shocks δ; the Beta distribution parameters β_1 and β_2; and the wedge parameter χ discussed above. This leaves seven model parameters in each submarket, $\{k_d^{\text{FLOW}}, e_d, z_d, \delta_d, \beta_{1d}, \beta_{2d}, \chi_d\}$, to be determined by fitting the model to seven empirical moments related to the impact of the ADA on the employment and wages of work and non-work disabled individuals, along with the share of accommodated matches pre-ADA, $\{\text{E}_d - \text{E}_{\text{ND}}, s_d/s_{\text{ND}}, \log(w_d/w_{\text{ND}}), \text{E}_d^1/\text{E}_d, \text{E}_{\text{d}}^{\text{ADA}} - \text{E}_d, \log(w_d^{\text{ADA}}/w_d), s_d^{\text{ADA}}/s_d\}$.

4.4.2 Identification

An intuitive argument for how our model is identified is as follows. A few parameters and functions are recovered outside of the model. We set the discount factor to 0.996, which corresponds to a 5% annual discount rate; we maintain that the worker bargaining weight is known (and equal to 0.5); we recover non-parametrically the fixed separation cost $\{k_d^{\text{SEP}}\}$ from EEOC information (see Figure 3b) and the distribution of the one-time fixed accommodation cost $\{H(k_d^{\text{FIXED}})\}$ from JAN information (see Figure 3a), separately for work-disabled and non-work disabled workers.

As for the parameters estimated within the model, in general, in a model like ours, it is complicated to establish which moment in the data is instrumental in identifying a specific parameter. In practice, the first four moments mentioned above ($\{\text{E}_d - \text{E}_{\text{ND}}, s_d/s_{\text{ND}}, \log(w_d/w_{\text{ND}}), \text{E}_d^1/\text{E}_d$) all refer to *between*-group differences in employment, job separation, wage, and accommodation outcomes among workers observed *before* the ADA was introduced, and therefore—for a given match productivity distribution—they help pin down the parameters that do not explicitly depend on the policy (in particular, $\{k_d^{\text{FLOW}}, e_d, z_d, \delta_d\}$). This is obviously true in the case of the efficiency parameter e_d, which displays no heterogeneity across different types of disabled workers in the post-ADA world because of our assumption that productivity is fully restored by accommodation. The post-ADA moments we use are related instead to *within*-group differences among workers. Heuristically, we search for the parameters of the productivity distribution (β_{1d}, β_{2d}) for each group d of workers that are consistent with the within-group differences that we observe in the data in terms of employment rates, job separation rates, and wages induced by the ADA for the two groups of disabled workers. In practice, this is not feasible—primarily in terms of the post-ADA wages for the work disabled—without introducing the additional parameter χ_d.

In Figures A20 and A21, we plot the numerical change in each moment in a neighborhood around the estimates to illustrate how local identification is achieved. To discuss a few cases from these two figures, notice, for example, that the pre-ADA moments do not contribute at all, as expected, to the identification

of the parameter χ_d. For the work disabled, the only parameter that seems to have some "bite" in pinning down k^{FLOW} is the share of accommodated workers, because too high a flow cost would decrease the share of workers that firms decide to accommodate in the pre-ADA world in the absence of an explicit mandate. As another example, the efficiency parameter e is mostly pinned down by the pre-ADA employment differences between disabled and non-disabled workers—which would be smaller in the case of a larger e_d—and, partly, from the share of accommodated workers in the pre-ADA world—since only when e_d is large enough, firms decide to accommodate disabled workers.[24]

4.4.3 Results

We present the model fit in Table 9. The model successfully captures the qualitative and quantitative differences that the ADA policy has generated between the labor market outcomes of work- and non-work disabled workers: the employment decline for the work disabled, the employment increase for the non-work disabled, the wage decline for the work disabled, and no change in wages for the non-work disabled.

We present all the model parameters in Table 10, which sheds light on the incentives for firms to accommodate workers with different types of disability. Our estimates of the efficiency losses for non-accommodated workers are similar for work and non-work disabled (87.6 and 87.0 percent). The labor market for the work disabled is characterized by higher fixed accommodation costs on average (from JAN) and higher expected separation costs (from EEOC). Our estimate for the flow cost of accommodation indicate this cost is substantially lower for the work disabled than the non-work disabled, equivalent to 7.3 percent of the mean wage for the work disabled and 14.7 percent of the mean wage for the non-work disabled. We estimate a lower relative value of non-market time for the work disabled than the non-work disables (0.7 compared to 0.93). The estimates for the distributions of match shocks imply that the mean match productivity for the work disabled is about three quarters that of the non-work disabled (0.49 compared to 0.67). Finally, we estimate a substantial role for the wedge parameter χ, especially for the work disabled. If we interpret χ as non-compliance with equal pay, we estimate that workers with work disabilities are paid wages equivalent to 70 percent of what a non-disabled worker would receive in a job with the same match productivity. The corresponding number for the non-work disabled is 93 percent. In the next section we discuss in more detail how pay equality and the role of non-compliance interact in determining the employment and wage outcomes observed post ADA.

[24] We are currently in the process of formalizing this argument by expanding the set of moments that we target to include moments about the level distributions of wages of all groups of workers before and after the ADA was introduced.

4.4.4 Evaluation of the Existing ADA Policy and Potential Alternative Designs

A natural question is whether the ADA policy achieved the goals it was set to accomplish and, more generally, whether the policy is efficient. In light of the differential impact of the policy on the labor market outcomes of work disabled and non-work disabled individuals, we now discuss which provisions of the policy are most responsible for an improvement in the employment and wage prospects of the non-work disabled and which, on the contrary, have lead to a decrease in the employment and wages of work disabled workers. In Tables 11 and 12, we conduct two exercises to illustrate the effect of the components of the ADA on the accommodation rates, employment, separations and wages of work and non-work disabled workers. In panel (A) of each table, we consider the effects of counterfactual policies that *include* only one component of the ADA at a time. For example, the first row considers a counterfactual policy that includes only the tax-subsidy provision, whereas the last row considers only the accommodation mandate. In panel (B), we perform a complementary exercise and examine counterfactual policies that *exclude* one of the components of the (full) ADA policy at a time. The first row refers to an ADA policy that excludes the tax subsidy and the last row refers to an ADA policy that excludes the accommodation mandate.

Looking first at the effect on the accommodation rate, note that the subsidy alone has a substantial impact on the accommodation rate, which increases from 0.33 to 0.91 for the work disabled and to 0.99 for the non-work disabled—these rates are quite close to the full accommodation induced by the ADA mandate. That said, these individual components of the policy have very different effects on employment. The subsidy by itself increases employment for both groups, 3.9 percentage points for the work disabled and 12.6 percentage points for the non-work disabled. The accommodation mandate (without the accompanying subsidy) decreases employment by 10.2 percentage points for the work disabled and by 13 percentage points for the non-work disabled. Both of these policies by themselves decrease job separation rates and have modest effects on wages—ranging from a decrease of 0.1 to an increase of 4.4 percent.

The effect of the separation costs turns out to be rather small overall. Separation rates do fall but employment is hardly affected, indicating that the job finding rate declines almost one-for-one with the separation rate. Indeed, Tables 13 and 14 confirm that vacancies fall in line with job separations. Hence, separation costs did not contribute to increase the employment of either group of disabled workers.

Turning to the effect of the equal pay component, or non-discrimination in wages, we find that with full compliance ($\chi = 1$), we would see substantial increases in the wages of both the work and non-work disabled—29 and 24 log points—accompanied by a drastic decline in employment, namely, a 50 percentage point decline for the work disabled and a 63 percentage point decline for the non-work disabled, leaving the employment rate for the two groups close to zero. The measured increase in mean wages is the

result of firms only employing workers with negligible accommodation costs in matches with the highest productivity. Not surprisingly, when we allow for the possibility of non-compliance in our model, we estimate that the post-ADA wages paid to work disabled and non-work disabled workers are only 70 and 93 percent of the corresponding wages of non-disabled workers with a comparable match productivity.

We now turn to consider whether, in light of our findings, even small modifications in the design of the ADA could have benefited both groups of disabled workers. To concisely summarize the overall effects of the policy on employment and wages, it is convenient to measure them through the value of employment and of unemployment for each group of workers and the value of firm profits from the model. In Tables 13 and 14, we examine the same policy counterfactuals discussed so far, and present their effects on the value of unemployment (second columns), the expected value of staring a job for a worker (third columns), and the expected value of hiring a new worker for a firm (fourth columns). In addition we present market tightness (fifth columns), which summarizes the profitability of job creation.

In the first two rows, we present the values from the model pre ADA and post ADA, using the full baseline ADA policy. We normalize each value to one in the pre ADA environment. Looking first at the baseline ADA policy, we see that values for both unemployment and employment decrease for the work disabled (by approximately seven percent) and increase for the non-work disabled (by approximately 4.5 percent). In both markets, we observe a substantial increase in the value to firms, arising from a combination of the tax subsidy and, to some extent, non-compliance to the requirement of no discrimination in wages.

Looking at panels (A), we see that a counterfactual ADA policy that includes only the tax subsidy for accommodation costs would increase the values of unemployment and employment for both the work and non-work disabled, as well as the profitability of their employment for firms—although to a lesser extent for firms employing the work disabled under the baseline ADA. For each of the remaining components of the policy, namely, no discrimination in wages, separation costs, and the accommodation mandate, implementing any single component decreases values, with the exception of the no-discrimination requirement when firms are not fully compliant ($\chi < 1$).

Finally, a broader question is whether the policy was called for in the first place on pure efficiency and welfare grounds—namely, whether the ADA has improved the efficiency of the labor markets of disabled and non-disabled workers or the welfare of the groups of workers considered. Naturally, considerations related to the acquisition of human capital on the part of employed workers, the possibility that the labor markets for either work or non-work disabled workers were not operating efficiently before the introduction of the ADA, or even a desire to induce firms to invest in new accommodation technologies by forcing them to accommodated disabled workers are all potential motivations for the policy. Each such consideration

could also rationalize why the outcomes we have studied are potentially not only bilaterally but also market-wide inefficient and so justify a policy like the ADA. We plan to consider each of these dimensions in some more detail next (in progress).

5 Conclusion

In this paper, we provide novel evidence on the impact of the ADA on the employment of workers with disabilities. A large literature has estimated a robustly *negative* effect of the policy on the employment and wages of disabled workers who suffer from limitations directly related to their ability to work. In contrast with the literature, by analyzing a much larger sample of workers from the SIPP, we find that the policy has had a large and significant *positive* effect on the employment of disabled workers who suffer from mental and physical limitations that are not directly related to their ability to work, even when severe, with more muted effects on their wages. We propose a search and matching model of the labor market with stochastic worker productivity that varies with a worker's disability status to assess the impact of the policy on the employment and wages of different groups of disabled workers. Our preliminary findings suggest that the policy has succeeded in providing work incentives to an important group of disabled individuals who are able to work. Based on our evaluation of the costs and benefits of the policy and of alternative designs of it, we tentatively conclude that the policy was successful in stimulating employment among non-work disabled workers able to work primarily because of the subsidies to firms it entailed. The requirement of no discrimination in wages, however, by limiting the pass-through of the costs of the policy from firms to workers, on balance has limited the beneficial effects of the policy on the labor market experiences of disabled workers.

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Table 1: SIPP Observable Characteristics by Disability Group

	No Disability	Work Disability	Non-Work Disability
Share of All Respondents	0.87	0.11	0.02
Share of the Disabled Population		0.84	0.16
Employed	0.82	0.39	0.73
Weekly Salary			
Average	467.66	357.73	410.37
Median	391.54	293.28	336.60
SD	316.89	269.37	290.25
Age			
22-29	0.25	0.13	0.20
30-39	0.30	0.22	0.26
40-49	0.27	0.32	0.28
50-58	0.17	0.34	0.25
Race			
White	0.84	0.79	0.84
Black	0.10	0.16	0.11
Other	0.05	0.05	0.05
Education			
Less than HS	0.12	0.27	0.18
HS	0.30	0.34	0.31
College	0.58	0.38	0.51
Occupation			
Admin Support	0.15	0.14	0.16
Construction	0.06	0.05	0.05
Exec Admin Managerial	0.12	0.08	0.10
Farming Forestry Fishing	0.01	0.02	0.01
Handlers Helpers Laborers	0.04	0.05	0.04
Machine Operators	0.06	0.08	0.07
Mechanics	0.03	0.03	0.03
Professionals	0.16	0.10	0.15
Protective Services	0.02	0.02	0.02
Sales	0.09	0.09	0.09
Service	0.09	0.13	0.12
Technicians	0.04	0.03	0.04
Transportation	0.04	0.04	0.03
Missing Occupation	0.10	0.13	0.09
Industry			
Agric Forestry Fishery	0.01	0.01	0.01
Business and Repair	0.06	0.06	0.06
Construction Industry	0.05	0.04	0.04
Entertainment	0.01	0.01	0.01
Finance Insurance Estate	0.06	0.04	0.05
Manufacturing	0.16	0.14	0.14
Mining	0.00	0.00	0.00
Personal Services	0.03	0.03	0.03
Professional Services	0.24	0.22	0.27
Public Admin	0.06	0.05	0.06
Retail	0.13	0.15	0.15
Utilities	0.07	0.06	0.07
Wholesale	0.04	0.03	0.03
Missing Industry	0.10	0.13	0.09
N	354,675	44,660	8,482

Note: This table presents summary statistics of observables for each disability group defined in Section 2.2. Wage, industry and occupation defined for the sample of employed; industry and occupation refer to first job.

Table 2: JAN Costs and EEOC Benefits

	JAN Costs			EEOC Benefits		
	No Disability	Work Disability	Non-Work Disability	No Disability	Work Disability	Non-Work Disability
Mean	61	1,610	791	914	19,143	10,759
SD	269	1,065	902	4,130	17,207	13,164
Weighted Mean	55	1,743	811	808	19,376	10,576
Weighted SD	265	1,117	956	3,966	18,425	1,3851
Benefits (1990 USD)					2,448,572,542	
Beneficiaries					142,459	

Note: This table presents statistics of the distributions of expected accommodation costs and awarded compensation for each disability group defined in Section 2.2.

Table 3: Difference-in-Difference Estimates of Employment Effects of ADA: CPS and SIPP

	(1) CPS, 1987 - 1996	(2) SIPP, 1986 - 1997	(3) SIPP, 1986 - 2010
Work Disability	-0.399***	-0.296***	-0.296***
	(0.00525)	(0.00663)	(0.00608)
After 1991	0.0231*	0.0238	-0.0167
	(0.00958)	(0.0130)	(0.0120)
Work Disability × After 1991	-0.0349***	-0.0521***	-0.129***
	(0.00570)	(0.00780)	(0.00657)
Observations	709,125	216,353	401,899

Regressions include year FE, demographics (age, race, education, and region), as well as demographics-year interaction terms.

Note: This table presents estimates from the difference-in-difference specification in Equation 2. The omitted group is individuals without work disability.

Table 4: Difference-in-Difference Estimates of Wage Effects of ADA: CPS and SIPP

	(1) CPS, 1987 - 1996	(2) SIPP, 1986 - 1997	(3) SIPP, 1986 - 2010
Work Disability	-0.322***	-0.236***	-0.236***
	(0.0172)	(0.0171)	(0.0161)
After 1991	0.107***	-0.0201	-0.220***
	(0.0228)	(0.0278)	(0.0270)
Work Disability × After 1991	-0.0646***	-0.0642**	-0.112***
	(0.0188)	(0.0203)	(0.0177)
Observations	550,961	148,273	273,414

Regressions include year FE, demographics (age, race, education, and region), as well as demographics-year interaction terms.

Note: This table presents estimates from the difference-in-difference specification in Equation 2. The dependent variable is $\ln(\text{wage})$. The omitted group is individuals without work disability.

Table 5: Difference-in-Difference Estimates of Employment Effects of ADA 1986-2010

	(1) All	(2) Male	(3) Female
Work disabled	-0.302***	-0.334***	-0.270***
	(0.00609)	(0.00732)	(0.00926)
Non-work disabled	-0.184***	-0.199***	-0.156***
	(0.0119)	(0.0153)	(0.0173)
After 1991	-0.0225*	0.0198	-0.0421**
	(0.0120)	(0.0202)	(0.0187)
Work disabled × After 1991	-0.125***	-0.125***	-0.121***
	(0.00658)	(0.00792)	(0.0100)
Non-work disabled × After 1991	0.121***	0.142***	0.109***
	(0.0130)	(0.0167)	(0.0188)
Observations	401,899	191,677	210,222

Note: This table presents estimates from the difference-in-difference specification in Equation 3. The omitted group is individuals with no disability. Regressions include year FE, demographics (age, race, education, and region), as well as demographics-year interaction terms.

Table 6: Monthly Job Finding Rate (From UN to E), Men 25-45

	1990	1992 and After	Difference	Relative to No Disability
No Disability	.0765	.0864	.0099	
	(.0132)	(.0038)	(.0138)	
Work Disabled	.0267	.0227	-.004	-.0138
	(.0107)	(.0024)	(.0110)	(.0176)
Non-Work Disabled Only	.0417	.0761	.0344	.0246
	(.0408)	(.0195)	(.0452)	(.0473)

Note: This table presents estimates of the share of non-employed in month t who are employed in month $t+1$ for men aged 25-45. We compute such rates for 1990 and for the years after (and including) 1992 for each disability group, as well as their difference. The last column reports the difference between the change in rate of each disability group and that of the no-disability group. Standard errors in parentheses are estimated as follows. For each disability group, we regress employment transition dummies on a constant to obtain the estimated probability of transition and (an approximation) of its standard error. We then use these to obtain estimates and standard errors of the differences in columns 3 and 4 by the delta method.

Table 7: Monthly Job Destruction Rate (From E to UN), Men 25-45

	1990	1992 and After	Difference	Relative to No Disability
No Disability	.0075	.0063	-.0012	
	(.0012)	(.0003)	(.0012)	
Work Disabled	.0152	.0218	.0066	.0078
	(.0067)	(.0025)	(.0072)	(.0073)
Non-Work Disabled Only	.0111	.0061	-.005	-.0038
	(.011)	(.0022)	(.0113)	(.0113)

Note: This table presents estimates of the share of employed in month t who are unemployed in month $t+1$ for men aged 25-45. We compute such rates for 1990 and for the years after (and including) 1992 for each disability group, as well as the difference. The last column reports the difference between the change in rate of each disability group and that of the no-disability group. Standard errors in parentheses are estimated as follows. For each disability group, we regress employment transition dummies on a constant to obtain the estimated probability of transition and (an approximation) of its standard error. We then use these to obtain estimates and standard errors of the differences in columns 3 and 4 by the delta method.

Table 8: Difference-in-Difference Estimates of Wage Effects of ADA 1986-2010

	(1) All	(2) Male	(3) Female
Work	-0.239***	-0.253***	-0.228***
	(0.0161)	(0.0201)	(0.0232)
Non-Work Only	-0.145***	-0.165***	-0.0553
	(0.0288)	(0.0389)	(0.0386)
After 1991	0.0628*	-0.0124	0.179***
	(0.0323)	(0.0406)	(0.0465)
Work × After 1991	-0.112***	-0.130***	-0.0907***
	(0.0177)	(0.0221)	(0.0255)
Non-Work Only × After 1991	-0.00613	0.0235	-0.0471
	(0.0308)	(0.0416)	(0.0412)
Observations	273,414	140,272	133,142

Regressions include year FE, demographics (age, race, education, and region), as well as demographics-year interaction terms.

Note: This table presents estimates from the difference-in-difference specification in Equation 3. The dependent variable is $\ln(\text{wage})$. The omitted group is individuals with no disability.

Table 9: Moment Fit

		Work Disabled		Non-work Disabled	
		Data	Model	Data	Model
Employment pre-ADA	$\mathrm{E}_d - \mathrm{E}_{\mathrm{ND}}$	-0.302	-0.302	-0.184	-0.181
		[0.01]		[0.01]	
Separation probability pre-ADA	s_d/s_{ND}	2.027	2.031	1.480	1.478
		[0.00]		[0.00]	
Wages pre-ADA	$\log(w_d/w_{\mathrm{ND}})$	-0.239	-0.221	-0.145	-0.164
		[0.02]		[0.03]	
Accommodation share pre-ADA	$\mathrm{E}_d^1/\mathrm{E}_d$	0.333	0.329	0.333	0.327
Change in employment post-ADA	$\mathrm{E}_d^{\mathrm{ADA}} - \mathrm{E}_d$	-0.125	-0.118	0.121	0.107
		[0.01]		[0.01]	
Change in separation probability	s_d^{ADA}/s_d	1.513	1.509	0.658	0.658
		[0.00]		[0.00]	
Change in log wages	$\log(w_d^{\mathrm{ADA}}/w_d)$	-0.112	-0.110	-0.006	0.044
		[0.02]		[0.03]	

Notes: The data moments are from the difference-in-difference estimates in Tables 5, 7, and 8. Standard errors are in square brackets. The pre-ADA accommodation share is from Daly and Bound (1996). For the non-disabled submarket, employment is given by $\mathrm{E}_{\mathrm{ND}} = 0.81$ (Table 1) and separations are $s_{\mathrm{ND}} = 0.034$ (Shimer, 2005).

Table 10: Model Parameters

		Work Disabled	Non-work Disabled	Source
Discount factor	β	0.996		5% annual discounting
Meeting function	α	0.500		Petrongolo and Pissarides
	A	0.246		Normalize $\theta_{\text{ND}} = 1$
Bargaining power	γ	0.500		Efficiency (ND submkt)
Vacancy posting cost	k	0.154		UN to E flows (ND submkt)
Accommodation cost subsidy	ξ	0.500		Tax code
Distribution of accommodation costs	$H(k^{\text{FIX}})$	Empirical CDF		JAN (Table 2, Figure 3a)
Expected separation costs	$\mathbb{E}[k^{\text{SEP}}]$	Empirical CDF		EEOC (Table 2, Figure 3b)
Flow cost of accommodation	$k^{\text{FLOW}}/\mathbb{E}[w]$	0.073	0.147	Internal calibration
Efficiency units of unaccommodated	e	0.876	0.870	Internal calibration
Value of non-market to market time	$z/\mathbb{E}[w]$	0.798	0.902	Internal calibration
Probability of match shock	δ	0.145	0.175	Internal calibration
Match productivity distribution	β_1	1.059	4.887	Internal calibration
	β_2	1.086	2.438	Internal calibration
Post-ADA wedge on efficiency units	χ	0.699	0.933	Internal calibration

Notes: The match productivity distribution is parametrized as a Beta distribution: $g(\varepsilon) = B\varepsilon^{(\beta_1-1)}(1-\varepsilon)^{(\beta_2-1)}$, where B is a normalizing constant. k^{FLOW} and z are normalized relative to the pre-ADA mean wage. The non-disabled submarket is paramatrized by $\beta_{1\text{ND}} = \beta_{2\text{ND}} = 1$, $\delta_{\text{ND}} = 0.0558$, $k_{\text{ND}} = 0.154$, and $z_{\text{ND}}/\mathbb{E}[w_{\text{ND}}] = 0.71$ (Hall and Milgrom, 2008).

Table 11: ADA Policy Counterfactuals, Outcomes in Work Disabled Submarket

	E_d^1/E	$\text{E}_d^{\text{ADA}} - \text{E}_d$	s_d^{ADA}/s_d	$\log(w_d^{\text{ADA}}/w_d)$
Baseline ADA policy	1.000	-0.118	1.509	-0.110
(A) ADA Policy including only:				
Subsidy for k^{FIX} and k^{FLOW}	0.906	0.039	0.916	0.044
Equal pay ($\chi = 1$)	0.753	-0.502	1.661	0.290
Equal pay ($\chi < 1$)	0.574	-0.133	1.501	-0.111
Separation costs k^{SEP}	0.344	-0.008	0.974	0.001
Accommodation mandate	1.000	-0.102	0.895	0.025
(B) ADA Policy excluding:				
Subsidy for k^{FIX} and k^{FLOW}	1.000	-0.154	1.486	-0.113
Equal pay	1.000	0.021	0.873	0.050
Separation costs k^{SEP}	1.000	-0.111	1.515	-0.109
Accommodation mandate	0.962	-0.118	1.511	-0.109

Notes: In panel (A) we compute a counterfactual ADA policy that includes only one component at a time. In panel (B) we compute a counterfactual ADA policy that excludes one one component at a time.

Table 12: ADA Policy Counterfactuals, Outcomes in Non-work Disabled Submarket

	$\mathrm{E}_d^1/\mathrm{E}$	$\mathrm{E}_d^{\mathrm{ADA}} - \mathrm{E}_d$	s_d^{ADA}/s_d	$\log(w_d^{\mathrm{ADA}}/w_d)$
Baseline ADA policy	1.000	0.107	0.658	0.044
(A) ADA Policy including only:				
Subsidy for k^{FIX} and k^{FLOW}	0.988	0.126	0.669	0.044
Equal pay ($\chi = 1$)	0.693	-0.633	3.148	0.237
Equal pay ($\chi < 1$)	0.458	-0.552	2.266	0.116
Separation costs k^{SEP}	0.328	0.002	0.953	-0.000
Accommodation mandate	1.000	-0.130	0.910	-0.001
(B) ADA Policy excluding:				
Subsidy for k^{FIX} and k^{FLOW}	1.000	-0.609	2.133	0.122
Equal pay	1.000	0.130	0.620	0.045
Separation costs k^{SEP}	1.000	0.134	0.668	0.043
Accommodation mandate	0.999	0.107	0.660	0.044

Notes: In panel (A) we compute a counterfactual ADA policy that includes only one component at a time. In panel (B) we compute a counterfactual ADA policy that excludes one one component at a time.

Table 13: ADA Policy Counterfactuals, Values in Work Disabled Submarket

	U	$\mathbb{E}[E(\varepsilon, k^{\mathrm{FIX}})]$	$\mathbb{E}[J(\varepsilon, k^{\mathrm{FIX}})]$	θ
Baseline pre ADA policy	1.000	1.000	1.000	1.000
Baseline post ADA policy	0.930	0.928	1.687	2.847
(A) ADA Policy including only:				
Subsidy for k^{FIX} and k^{FLOW}	1.036	1.037	1.077	1.160
Equal pay ($\chi = 1$)	0.894	0.892	0.074	0.005
Equal pay ($\chi < 1$)	0.928	0.925	1.553	2.412
Separation costs k^{SEP}	0.992	0.992	0.961	0.924
Accommodation mandate	0.997	0.998	0.751	0.563
(B) ADA Policy excluding:				
Subsidy for k^{FIX} and k^{FLOW}	0.925	0.923	1.383	1.912
Equal pay	1.030	1.031	1.005	1.011
Separation costs k^{SEP}	0.931	0.929	1.760	3.099
Accommodation mandate	0.930	0.927	1.697	2.878

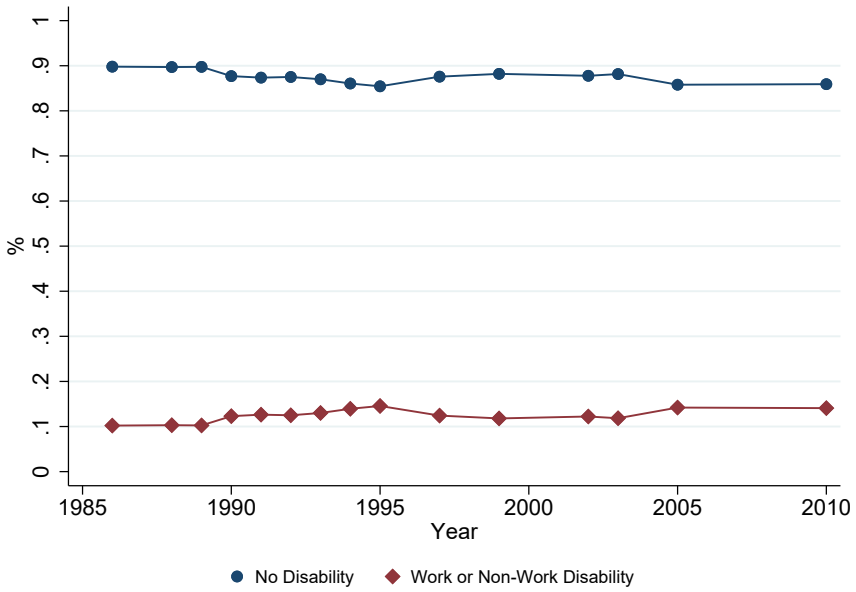
Notes: In panel (A) we compute a counterfactual ADA policy that includes only one component at a time. In panel (B) we compute a counterfactual ADA policy that excludes one one component at a time.

Table 14: ADA Policy Counterfactuals, Values in Non-work Disabled Submarket

	U	$\mathbb{E}[E(\varepsilon, k^{\text{FIX}})]$	$\mathbb{E}[J(\varepsilon, k^{\text{FIX}})]$	θ
Baseline pre ADA policy	1.000	1.000	1.000	1.000
Baseline post ADA policy	1.044	1.045	1.132	1.281
(A) ADA Policy including only:				
Subsidy for k^{FIX} and k^{FLOW}	1.048	1.049	1.197	1.432
Equal pay ($\chi = 1$)	0.938	0.936	0.021	0.000
Equal pay ($\chi < 1$)	0.956	0.954	0.246	0.060
Separation costs k^{SEP}	0.997	0.997	0.973	0.947
Accommodation mandate	0.990	0.991	0.716	0.513
(B) ADA Policy excluding:				
Subsidy for k^{FIX} and k^{FLOW}	0.943	0.943	0.126	0.016
Equal pay	1.046	1.047	1.161	1.347
Separation costs k^{SEP}	1.048	1.048	1.264	1.598
Accommodation mandate	1.044	1.042	1.133	1.284

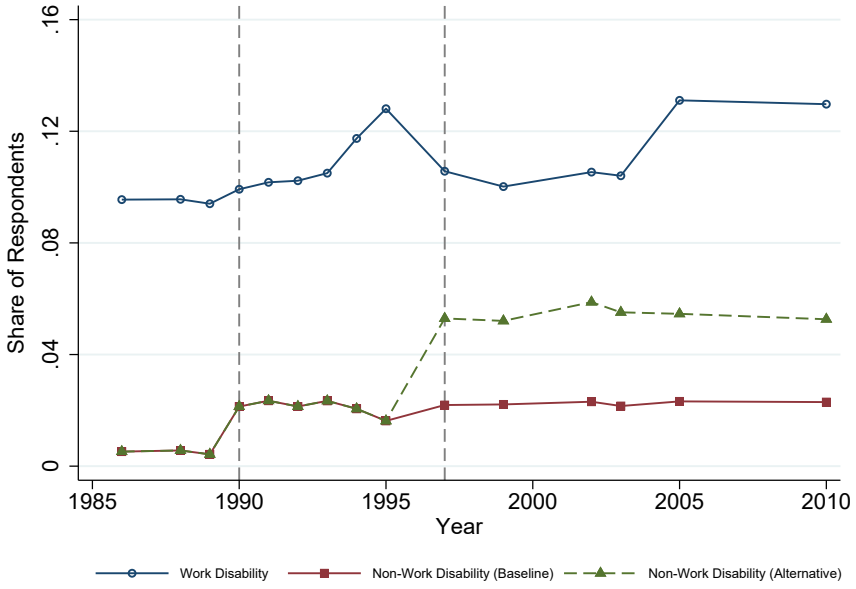
Notes: In panel (A) we compute a counterfactual ADA policy that includes only one component at a time. In panel (B) we compute a counterfactual ADA policy that excludes one one component at a time.

Figure 1: Shares of People With and Without a Disability, 1986-2010



Note: This figure presents, for each year in SIPP, the shares of respondents who report a disability (either work or non-work disability) and those who do not.

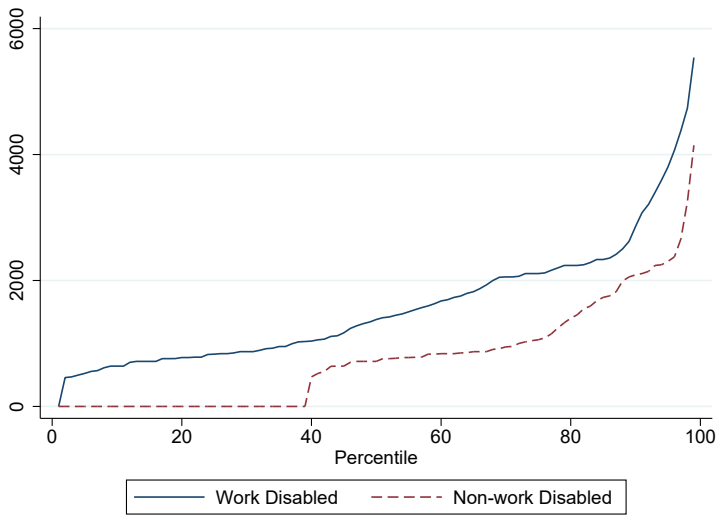
Figure 2: Proportions with Different Type of Disability, 1986-2010



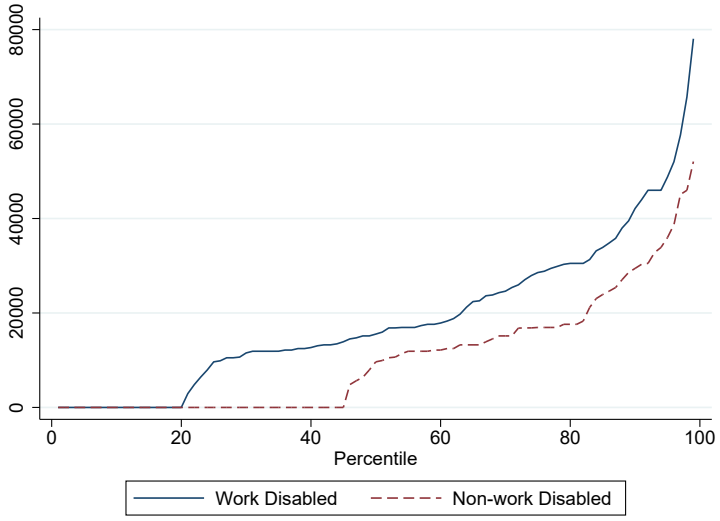
Note: This figure plots the share of respondents who report a work disability and the share of respondents who report only a non-work disability. We include two definitions of non-work disability: Our baseline definitions (which excludes the mental disabilities that were asked starting in 1996), and an alternative definition that includes them. The vertical lines indicate the years in which substantial changes in the SIPP questionnaire take place.

Figure 3: Distribution of Estimated Accommodation Costs and EEOC Benefits

(a) Estimated Accommodation Costs



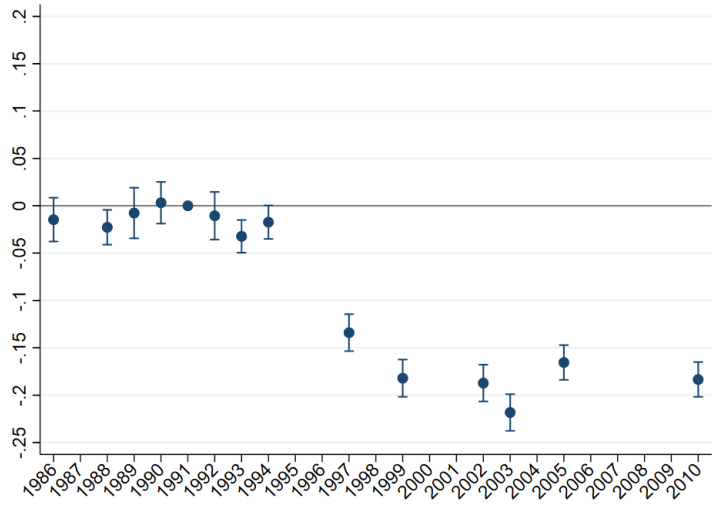
(b) Estimated EEOC Benefits



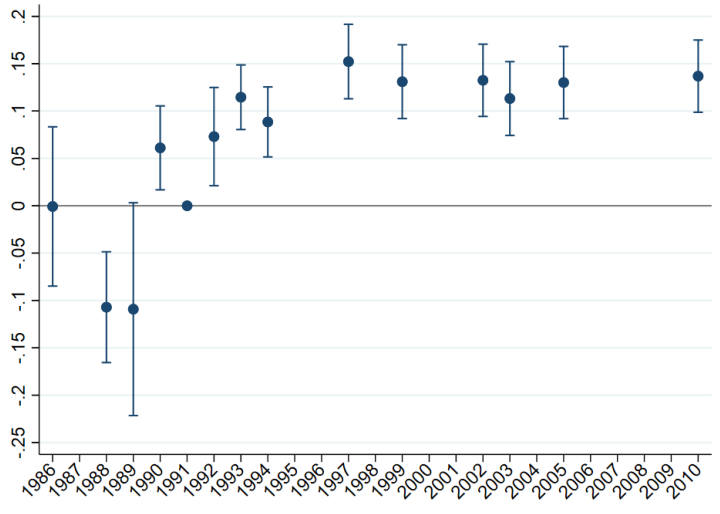
Note: This figure presents percentiles of accommodation costs, estimated using data from the Job Accommodation Network (JAN), and expected awards for discrimination cases filed with the U.S. Equal Employment Opportunity Commission (EEOC). See Section 2.4 for a discussion of the data.

Figure 4: SIPP Employment Event Study by Disability Status

(a) Work Disabled



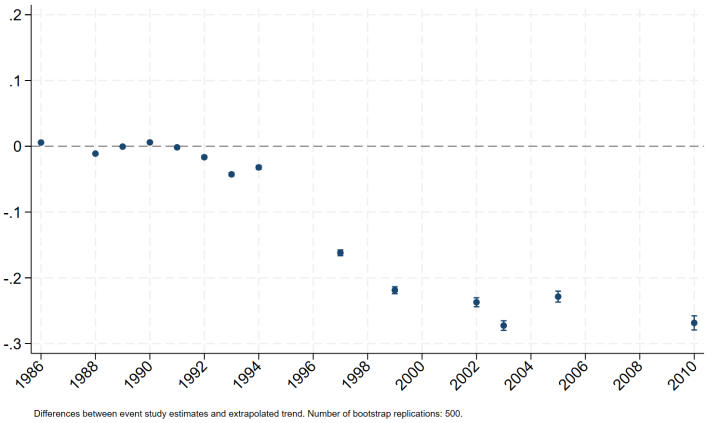
(b) Non-Work Disabled



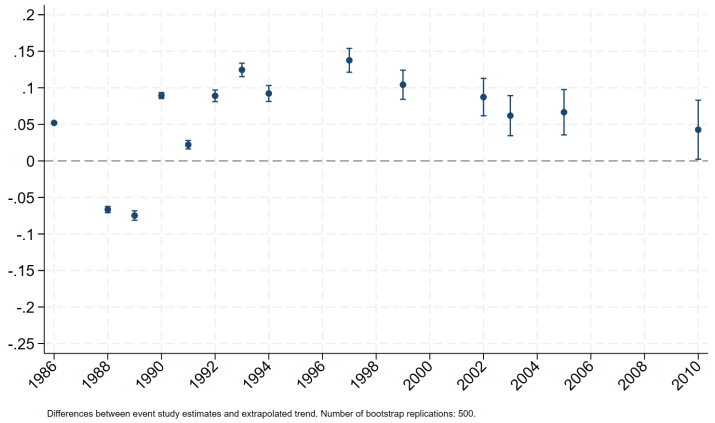
Note: This figure presents estimates from the event study specification in Equation 3. The omitted group for both figures is individuals with no disability.

Figure 5: SIPP Employment Event Study by Disability Status - Accounting for Trend

(a) Work Disabled



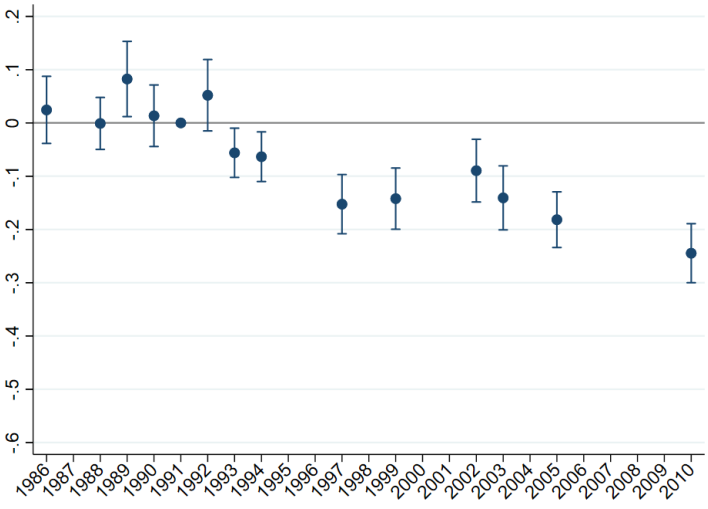
(b) Non-Work Disabled



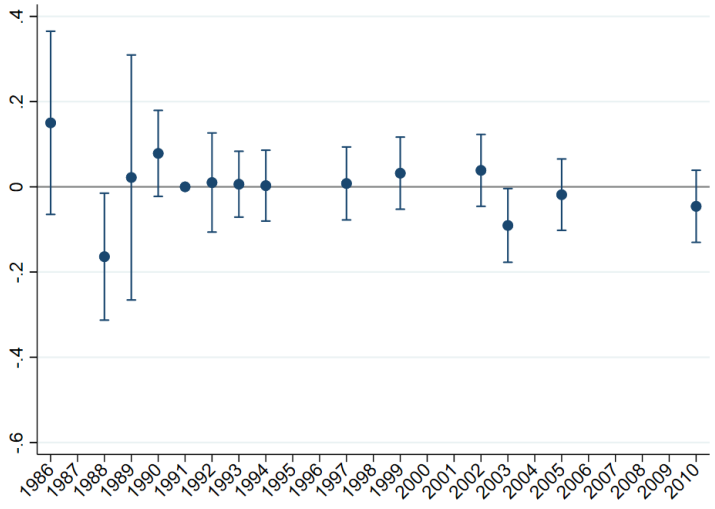
Note: This figure presents estimates from the event study specification in Equation 3. The omitted group for both figures is individuals with no disability. We account for trends using a method suggested by Freyaldenhoven et al. (2021). That is, we use pre-1991 estimates to estimate a linear trend as a function of time, and we extract trend fitted values for 1991 and later years. We then subtract this trend from the estimates of Figure 4. Confidence intervals are bootstrapped, clustering at the respondent level.

Figure 6: SIPP Wage Event Study by Disability Status

(a) Work Disabled



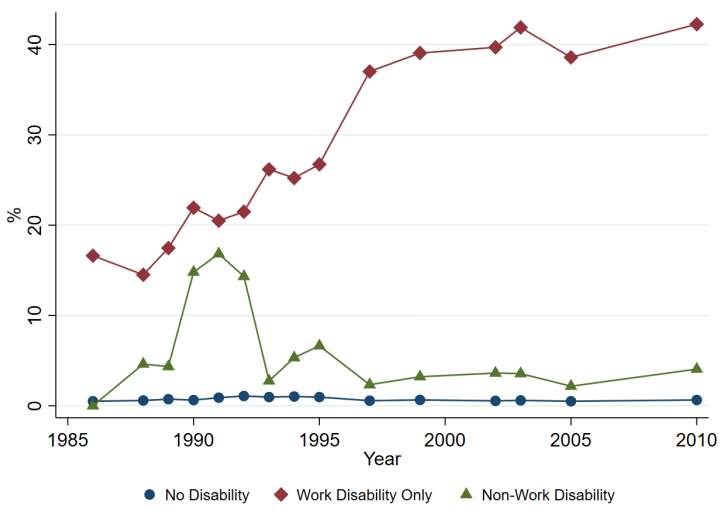
(b) Non-Work Disabled



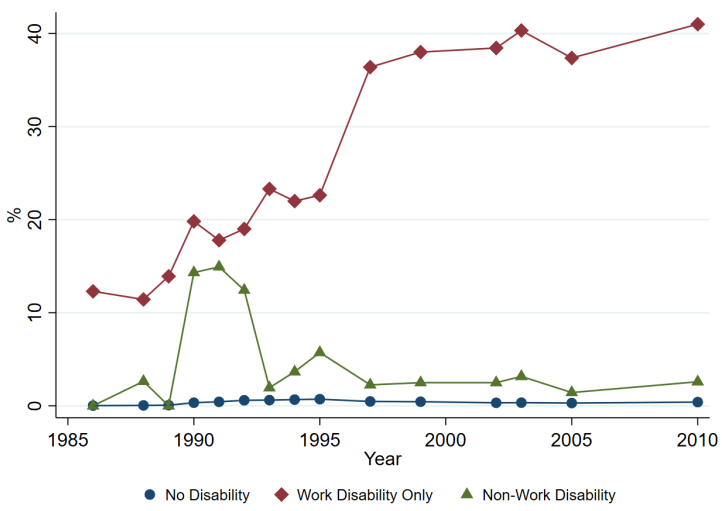
Note: This figure presents estimates from the event study specification in Equation 4. The omitted group for both figures is individuals with no disability.

Figure 7: SIPP Recipiency Time Series by Disability Status

(a) OASDI/SSI Recipiency Time Series



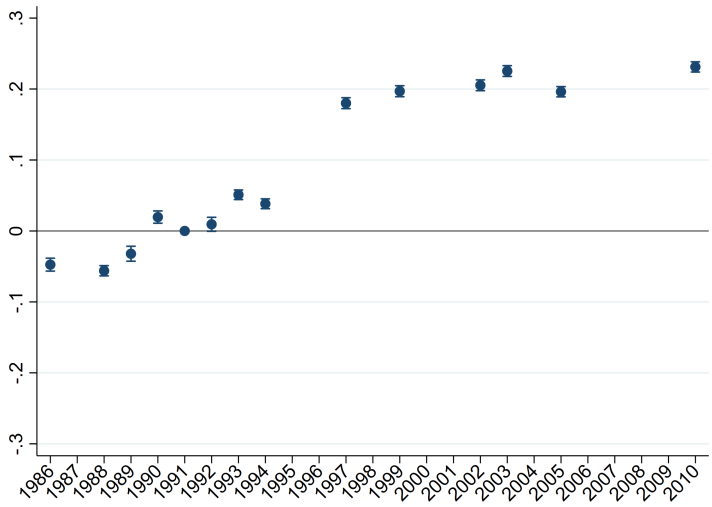
(b) SSDI/SSI Recipiency Time Series



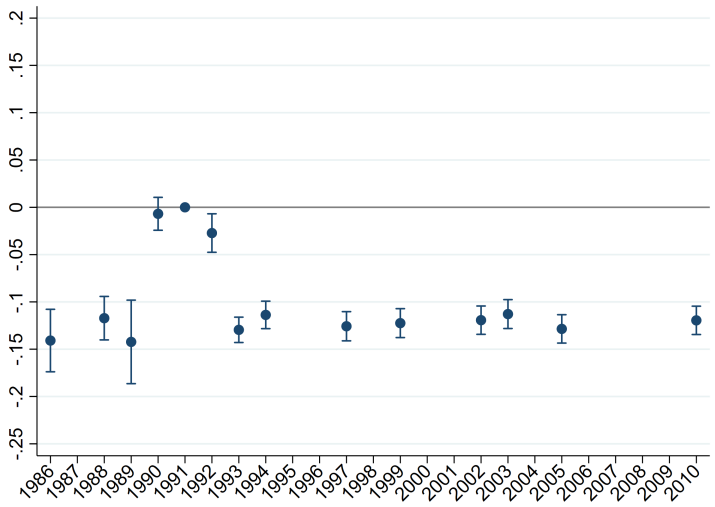
Note: This figure presents time series of OASDI and/or SSI recipiency (panel a) and SSDI and/or SSI recipiency (panel b).

Figure 8: SIPP SSDI/SSI Recipiency Event Study by Disability Status

(a) Work Disabled



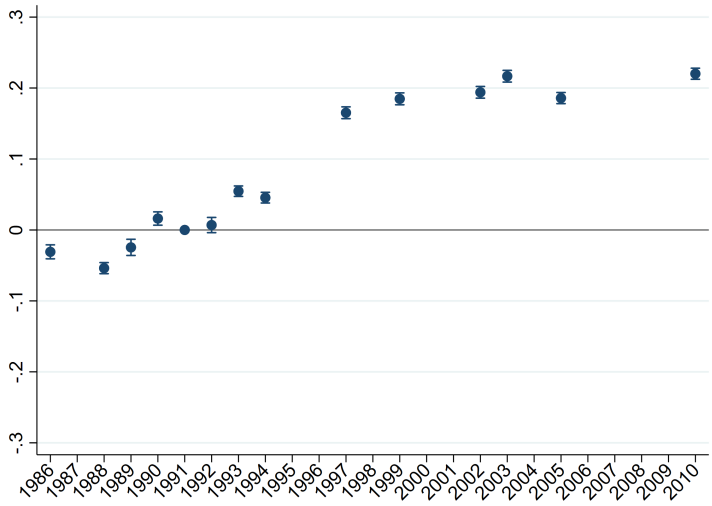
(b) Non-Work Disabled



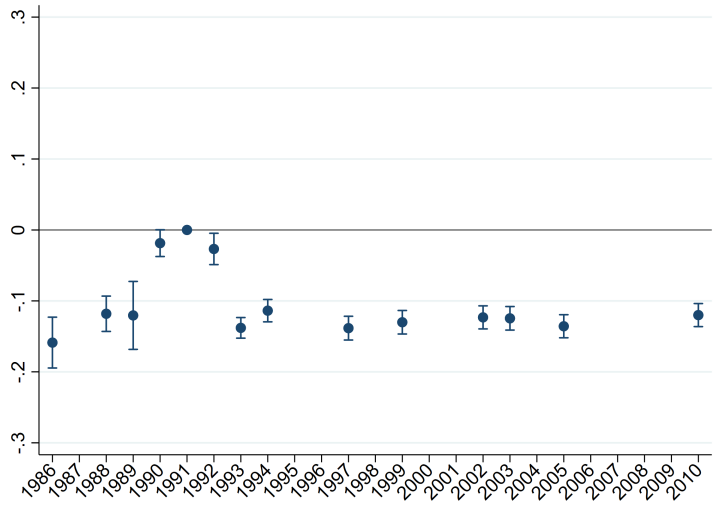
Note: This figure presents estimates from an event study specification like Equation 3, with SSDI and/or SSI recipiency as dependent variable. The omitted group for both figures is individuals with no disability.

Figure 9: SIPP OASDI/SSI Recipiency Event Study by Disability Status

(a) Work Disabled



(b) Non-Work Disabled



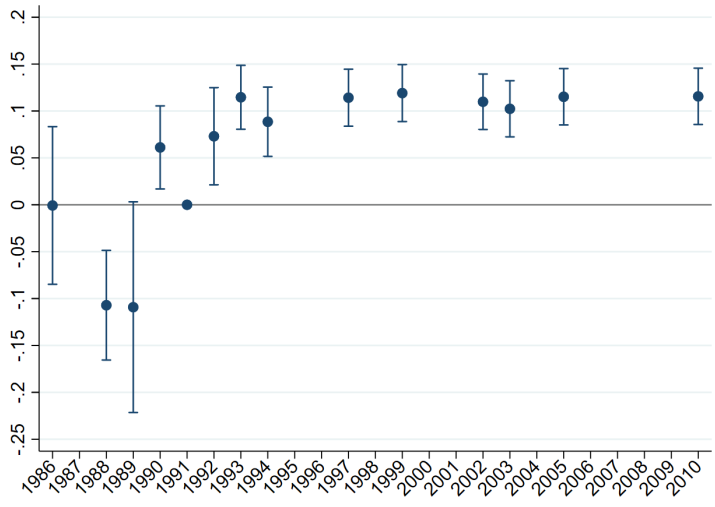
Note: This figure presents estimates from an event study specification like Equation 3, with OASDI and/or SSI recipiency as dependent variable. The omitted group for both figures is individuals with no disability.

Figure 10: SIPP Employment Event Study by Disability Status (Expanding Mental Health)

(a) Work Disabled



(b) Non-Work Disabled

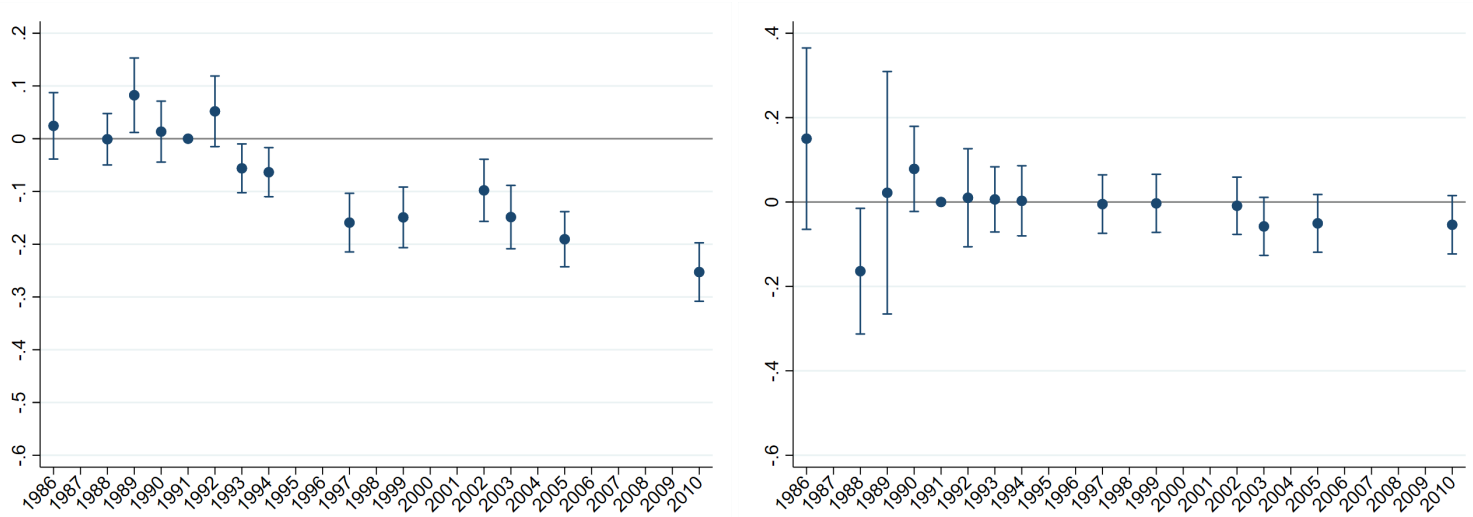


Note: This figure presents estimates from the event study specification in Equation 3. The omitted group for both figures is individuals with no disability. The results in this figure differ from those in Figure 4 in that the disability groups used in this figure consider the mental disability conditions included in the questionnaire from 1996 onwards (see Figure A1.)

Figure 11: SIPP Wage Event Study by Disability Status (Expanding Mental Health)

(a) Work Disabled

(b) Non-Work Disabled



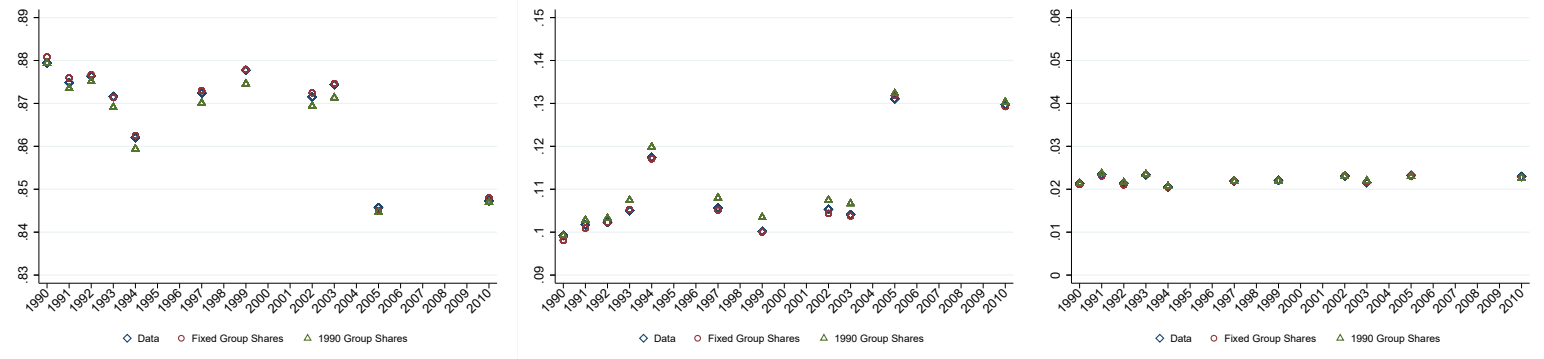
Note: This figure presents estimates from the event study specification in Equation 4. The omitted group for both figures is individuals with no disability. The results in this figure differ from those in Figure 6 in that the disability groups used in this figure consider the mental disability conditions included in the questionnaire from 1996 onwards (see Figure A1.)

Figure 12: Shift-Share Decomposition Exercise

(a) No Disability

(b) Work Disability

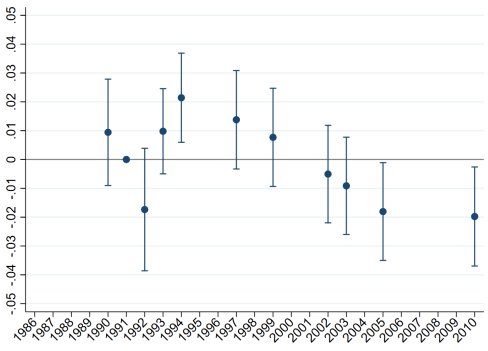
(c) Non-Work Disability



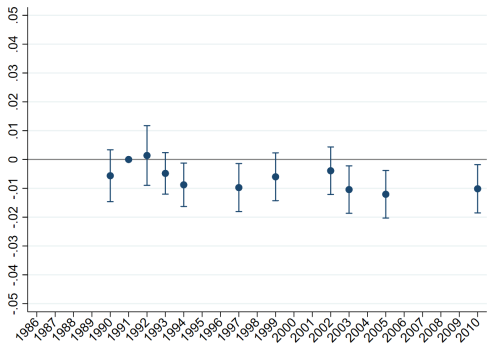
Note: This figure presents estimates from the shift-share decomposition described in Section 3.5. 'Fixed Group Shares' fixes the size of each demographic cell at its share in data pooled over the years. '1990 Group Shares' fixes the size of each demographic cell at its share in 1990 data.

Figure 13: SIPP Disability Linear Probability Model

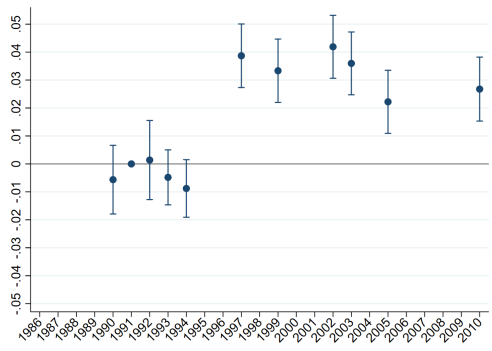
(a) Work Disability (WD)



(b) Non-Work Disability



(c) Non-Work Disability (Added Mental)



Note: This figure presents estimates from an event study of disability group membership. The omitted group for each figure is individuals with no disability. Figure (b) does not include mental disability conditions included in the questionnaire from 1996 onwards (see Figure A1); Figure (c) shows that including these conditions causes a discrete jump in the probability of qualifying as non-work disabled.

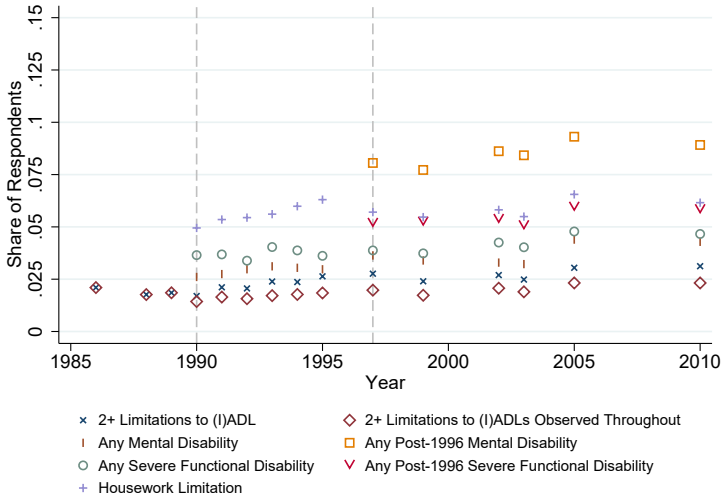
A Additional Details About the Data

A.1 CPS vs. SIPP

Another piece of evidence towards establishing comparability of CPS and SIPP comes from looking at the balance of demographics across the two regression samples. Table A1 shows the sample prevalence of demographic covariates included in the regressions the results of which are displayed in this section. Covariates seem to be relatively well balanced, with the exception of some minor HS-College imbalance and a higher share of work disabled respondents in the SIPP, which may be due to its targeting. Taken together, Tables 3 and A1 show that our sample is not substantially different from Acemoglu and Angrist (2001)'s sample along observable dimensions, and that analysing SIPP data yields results on the effect of the ADA on labor market outcomes of the disabled that are qualitatively similar to those in Acemoglu and Angrist (2001).

A.2 Qualifying Conditions for Non-Work Disability

Figure A1: Qualifying Conditions for Non-Work Disability, 1986-2010



Note: This figure plots the yearly share of respondents who qualify for each condition that classifies an individual as non-work disabled. Conditions are described in Section 2.2. Plotted shares consider each condition separately (i.e. they are not cumulative). The vertical lines indicate the years in which substantial changes in the SIPP questionnaire take place.

A.3 SIPP Topical Modules Used

See Tables A2 for a list of the SIPP Topical modules we used and A3 for their timing over the years they cover.

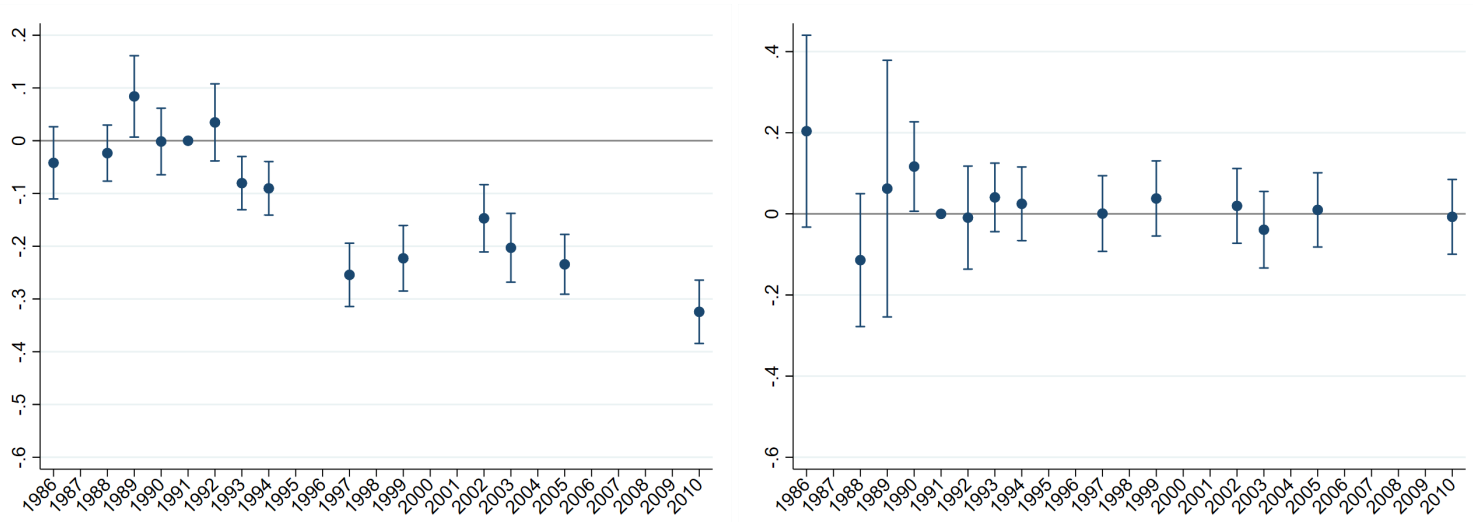
A.4 Trimming Wages

Acemoglu and Angrist (2001) trim weekly wages (deflated by 1990 CPI-W) to lie between 25 and 2000 when estimating their wage event studies. We follow suit in the main text. Below we present tables and figures without such trimming. As Figures A2 and A3 show, results are virtually unchanged.

Figure A2: SIPP Wage Event Study by Disability Status

(a) Work Disabled

(b) Non-Work Disabled

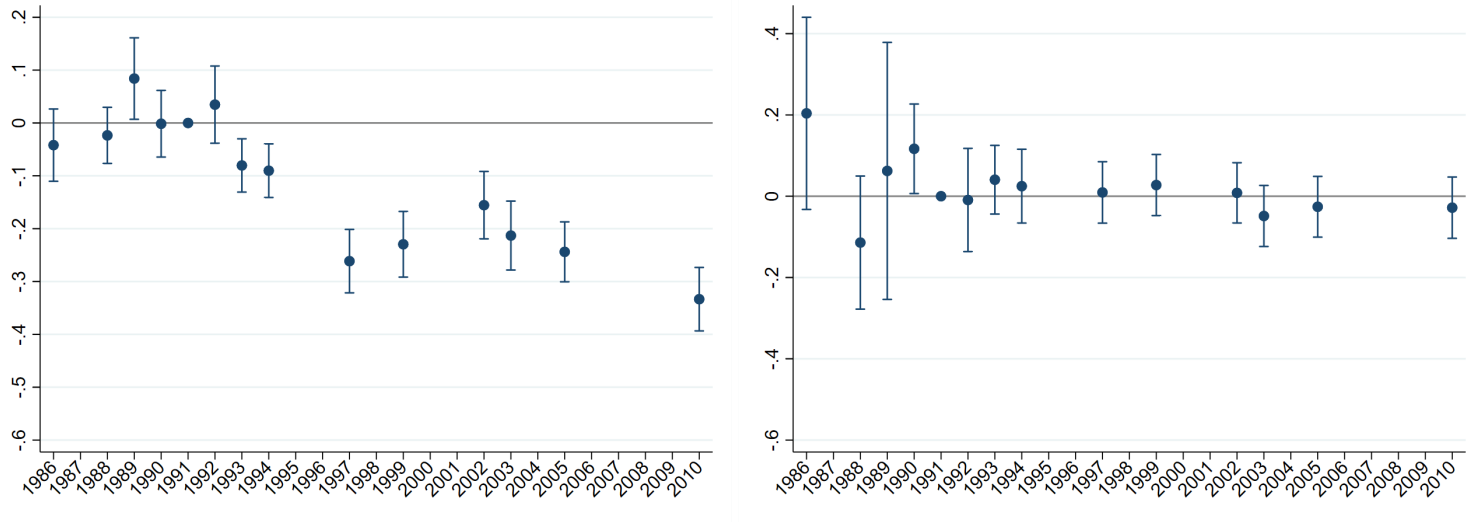


Note: This figure presents estimates from the event study specification in Equation 4. The omitted group for both figures is individuals with no disability. The results in this figure differ from those in Figure 6 in that the wage data are not trimmed as in Acemoglu and Angrist (2001) (who trim wage to lie between 25 and 2000 1988 USD/week.)

Figure A3: SIPP Wage Event Study by Disability Status (Mental Health Expanding)

(a) Work Disabled

(b) Non-Work Disabled



Note: This figure presents estimates from the event study specification in Equation 4. The omitted group for both figures is individuals with no disability. The results in this figure differ from those in Figure 11 in that the wage data are not trimmed as in Acemoglu and Angrist (2001) (who trim wage to lie between 25 and 2000 1988 USD/week.) They also differ from those in Figure A2 in that the disability groups used in this figure consider the mental disability conditions included in the questionnaire from 1996 onwards (see Figure A1.)

A.5 Observables

Table 1 displays the prevalence of observables across the three disability groups in the full sample (1984-2010). Observables are defined categorically for consistency with Acemoglu and Angrist (2001). While race is fairly balanced, the disabled tend to be significantly older than the non-disabled (much of the difference in the 22-29 group is made up by an opposite difference in the 50-58 group) and way more likely to not have completed high school (again, the high school completion gap is almost entirely made up by an opposite difference in the college completion rate.) Unsurprisingly, respondents reporting both work and non-work disability fare considerably worse in educational achievement than the other two disability groups. Disability groups are well balanced geographically, whereas as expected they are not balanced across industries and occupations. Tellingly, services are one of the few occupations where disabled workers have similar employment rates to the not disabled. Within the disabled, work-disabled and non-work-disabled individuals are characterized by very similar age, race, marital status, geographical location and other demographics, but the non-work disabled are significantly more likely to have a college degree – almost as likely as non-disabled individuals. Non-work disabled individuals are also more likely to be employed, and to be employed in executive/admin/managerial positions, professional specialties, and service occupations.

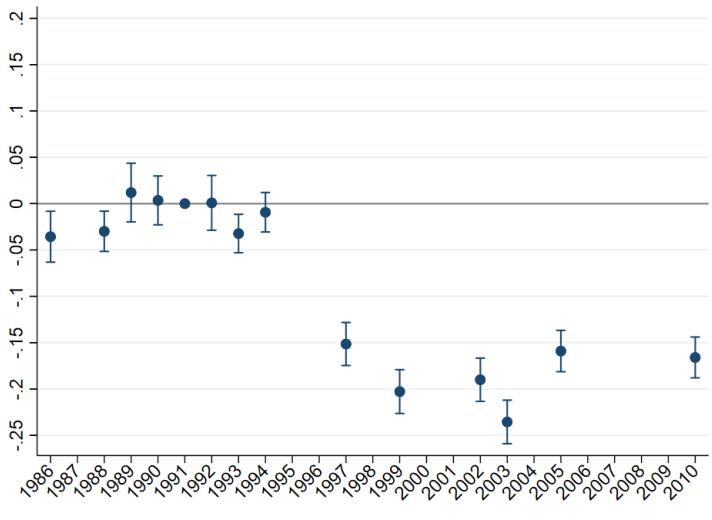
We interpret these findings as evidence supporting the notion that, for non-work disabled individuals, human capital is higher, more general and occupations more human-capital intensive. As a result, they are more productive and may require less, and less expensive, accommodation. This is consistent with evidence by the U.S. Labor Department Job Accommodation Network, and these features may explain why ADA has been more successful for this group of workers.

B Additional Event Studies

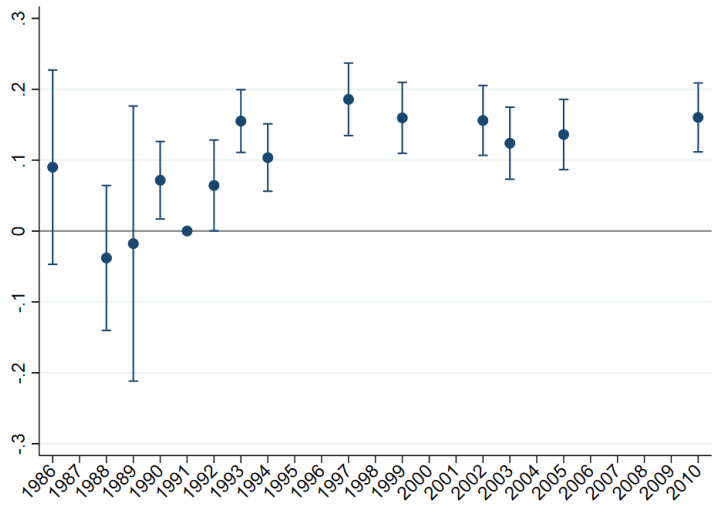
We report here additional event studies that separate men and women and find very similar results to those reported in the main text.

Figure A4: SIPP Employment Event Study by Disability Status (Men)

(a) Work Disabled



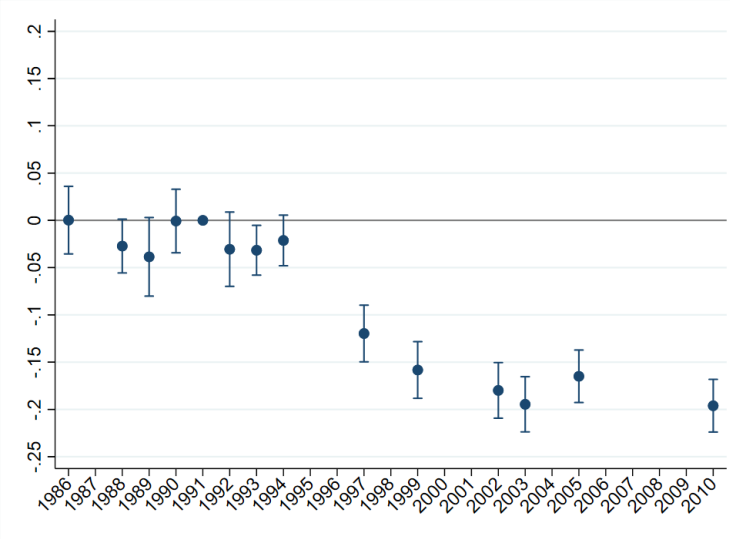
(b) Non-Work Disabled



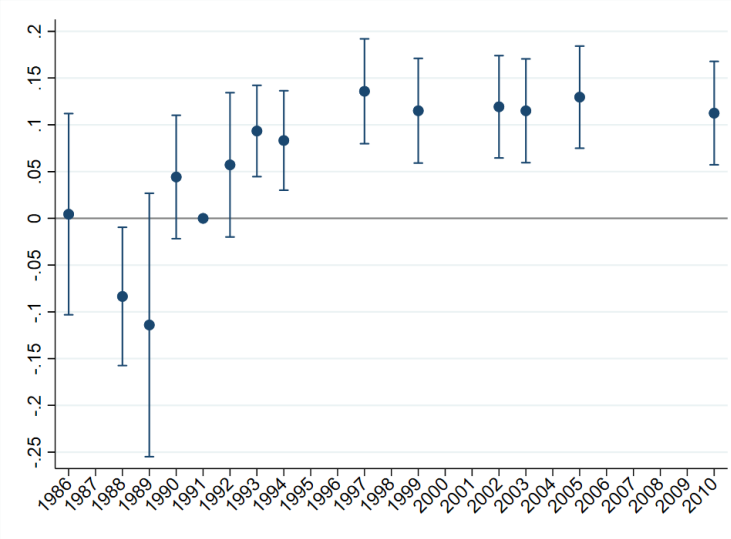
Note: This figure presents estimates from the event study specification in Equation 3 for the sample of men. The omitted group for both figures is individuals with no disability.

Figure A5: SIPP Employment Event Study by Disability Status (Women)

(a) Work Disabled



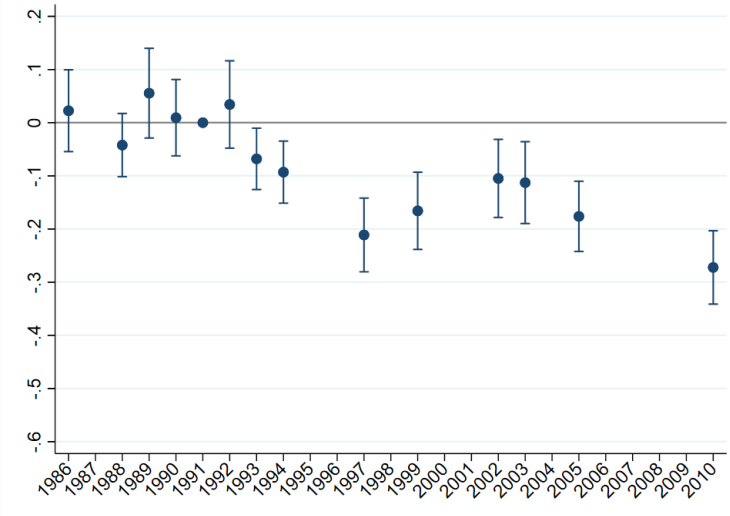
(b) Non-Work Disabled



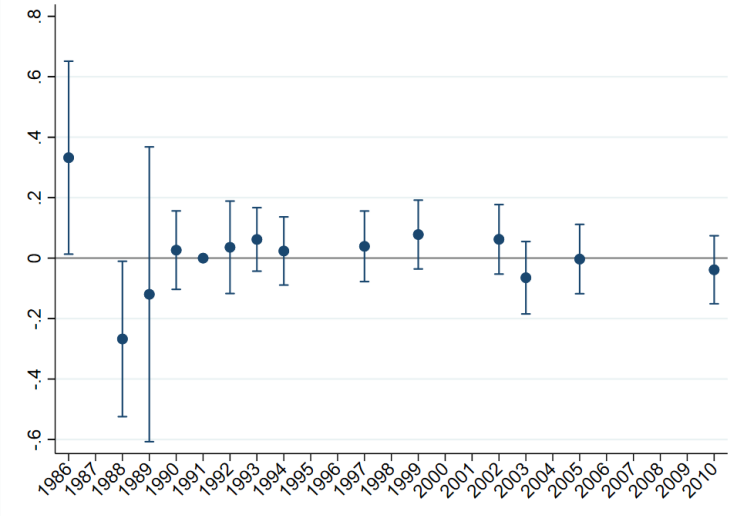
Note: This figure presents estimates from the event study specification in Equation 3 for the sample of women. The omitted group for both figures is individuals with no disability.

Figure A6: SIPP Wage Event Study by Disability Status (Men)

(a) Work Disabled



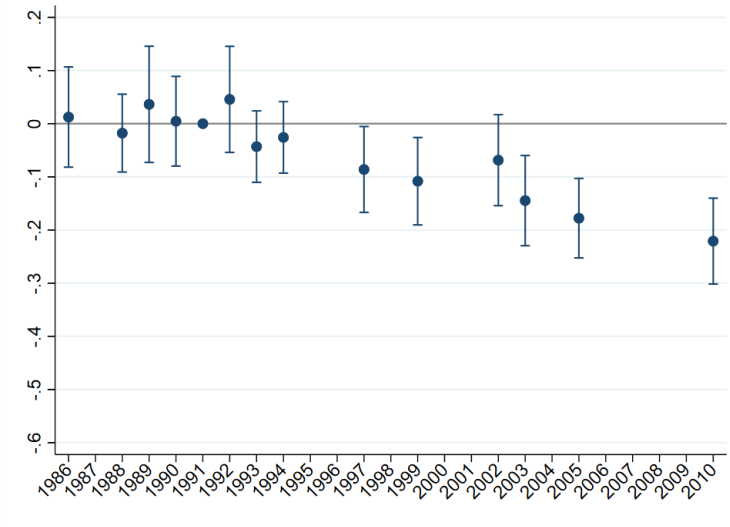
(b) Non-Work Disabled



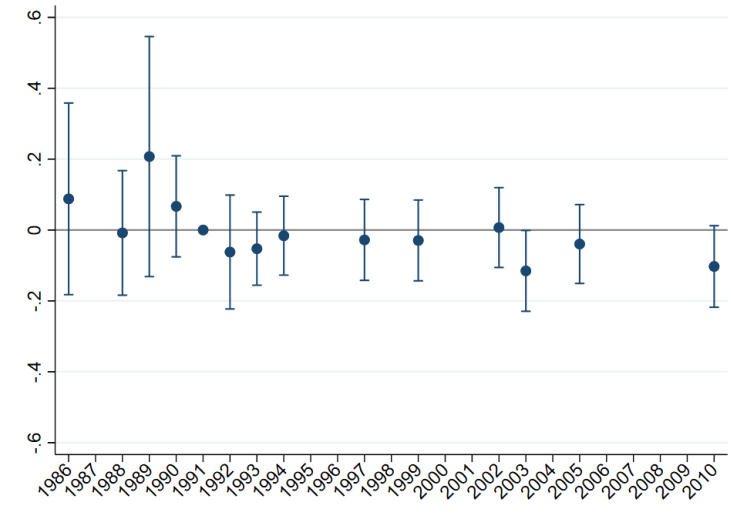
Note: This figure presents estimates from the event study specification in Equation 4 for the sample of men. The omitted group for both figures is individuals with no disability.

Figure A7: SIPP Wage Event Study by Disability Status (Women)

(a) Work Disabled



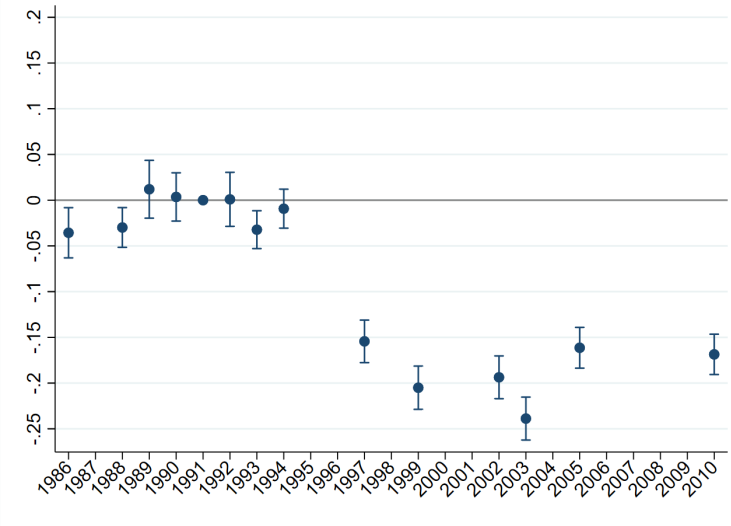
(b) Non-Work Disabled



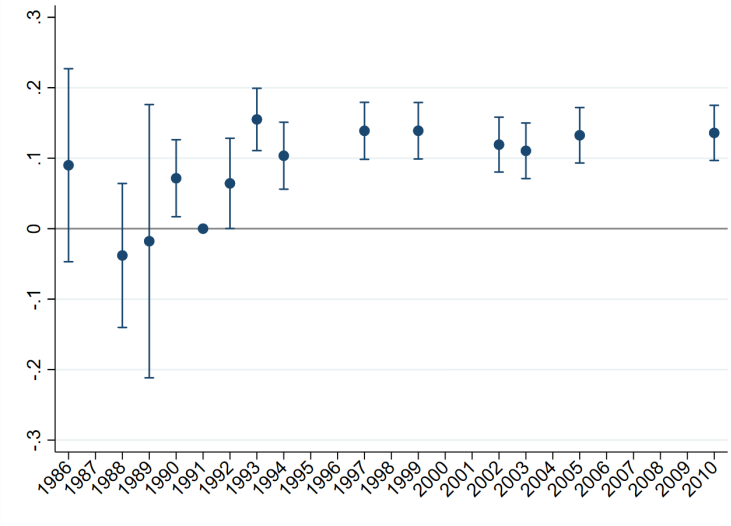
Note: This figure presents estimates from the event study specification in Equation 4 for the sample of women. The omitted group for both figures is individuals with no disability.

Figure A8: SIPP Employment Event Study by Disability Status (Mental Health Expanding: Men)

(a) Work Disabled



(b) Non-Work Disabled

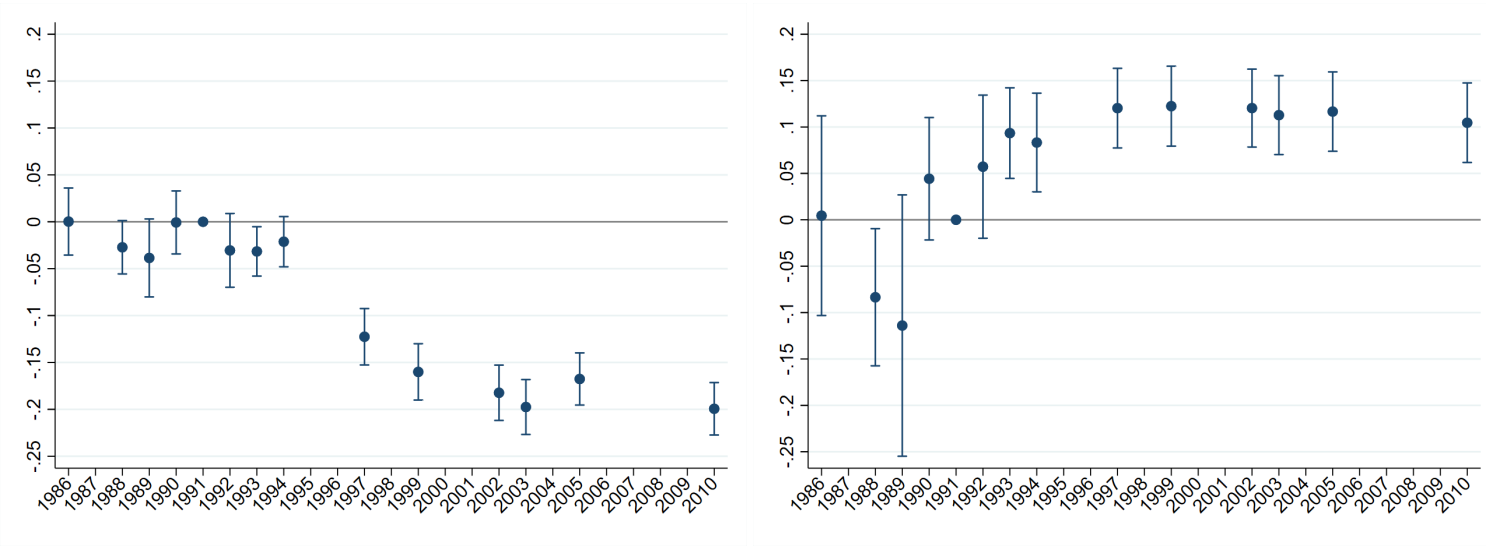


Note: This figure presents estimates from the event study specification in Equation 3 for the sample of men. The omitted group for both figures is individuals with no disability. Disability groups used in this figure consider the mental disability conditions included in the questionnaire from 1996 onwards (see Figure A1.)

Figure A9: SIPP Employment Event Study by Disability Status (Mental Health Expanding: Women)

(a) Work Disabled

(b) Non-Work Disabled

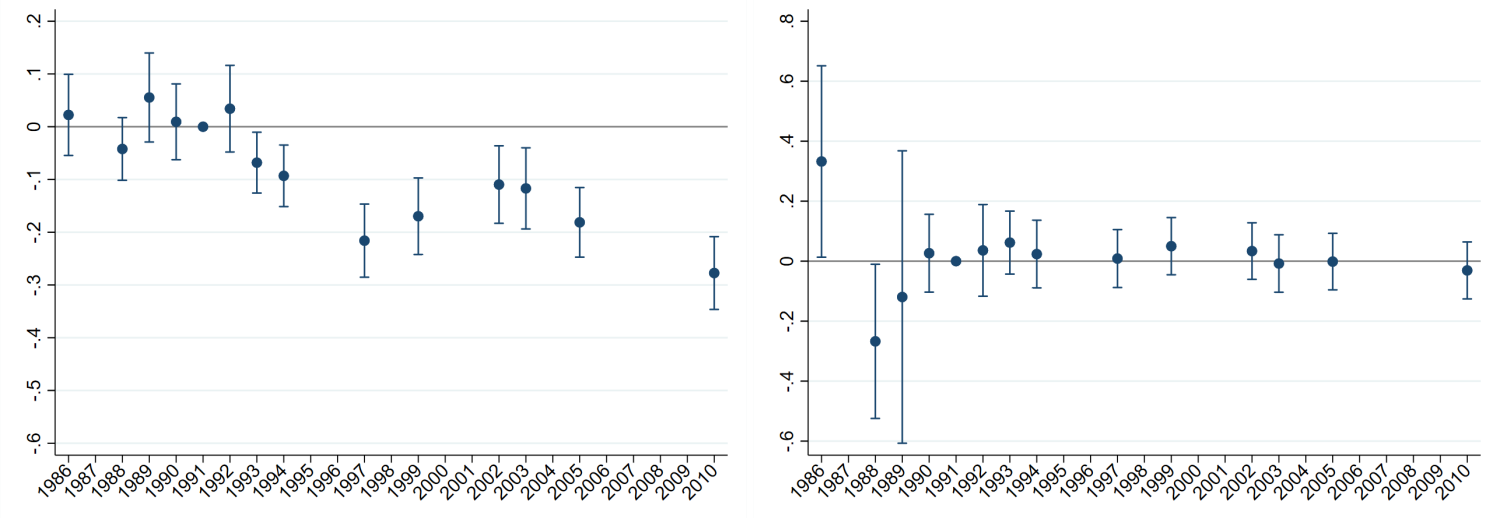


Note: This figure presents estimates from the event study specification in Equation 3 for the sample of women. The omitted group for both figures is individuals with no disability. Disability groups used in this figure consider the mental disability conditions included in the questionnaire from 1996 onwards (see Figure A1.)

Figure A10: SIPP Wage Event Study by Disability Status (Mental Health Expanding: Men)

(a) Work Disabled

(b) Non-Work Disabled

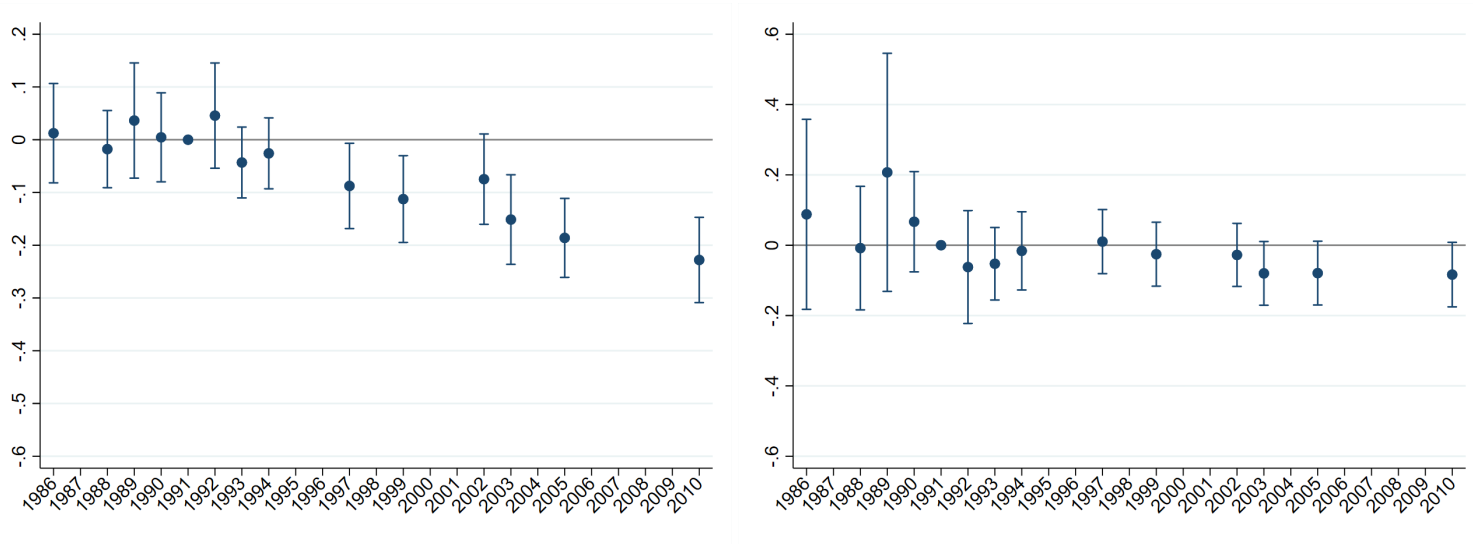


Note: This figure presents estimates from the event study specification in Equation 4 for the sample of men. The omitted group for both figures is individuals with no disability. Disability groups used in this figure consider the mental disability conditions included in the questionnaire from 1996 onwards (see Figure A1.)

Figure A11: SIPP Wage Event Study by Disability Status (Mental Health Expanding: Women)

(a) Work Disabled

(b) Non-Work Disabled



Note: This figure presents estimates from the event study specification in Equation 4 for the sample of women. The omitted group for both figures is individuals with no disability. Disability groups used in this figure consider the mental disability conditions included in the questionnaire from 1996 onwards (see Figure A1.)

Figure A12: SIPP Recipiency Time Series by Disability Status (Women)

(a) OASDI/SSI Recipiency Time Series

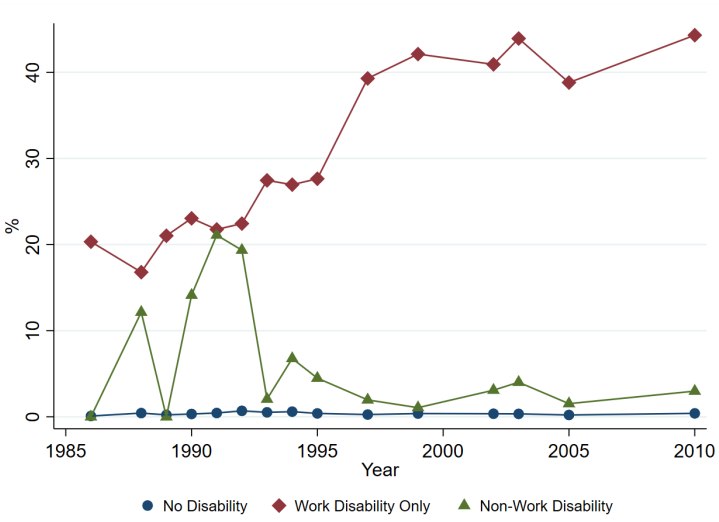
(b) SSDI/SSI Recipiency Time Series



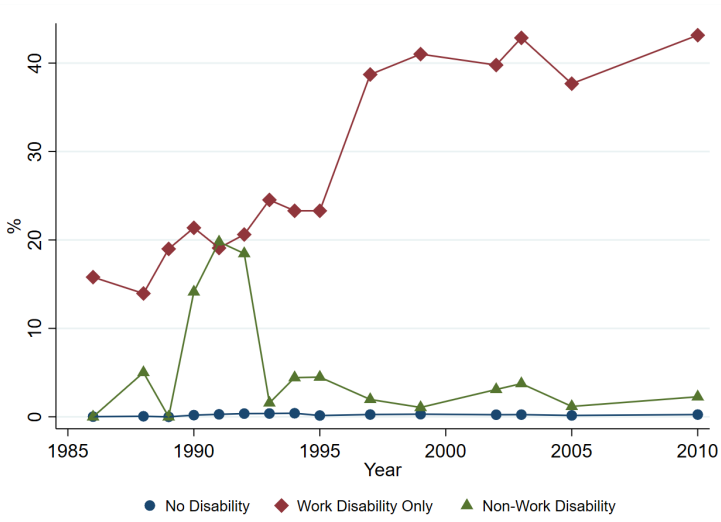
Note: This figure presents time series of OASDI and/or SSI recipiency (panel a) and SSDI and/or SSI recipiency (panel b) for the sample of women.

Figure A13: SIPP Recipiency Time Series by Disability Status (Men)

(a) OASDI/SSI Recipiency Time Series



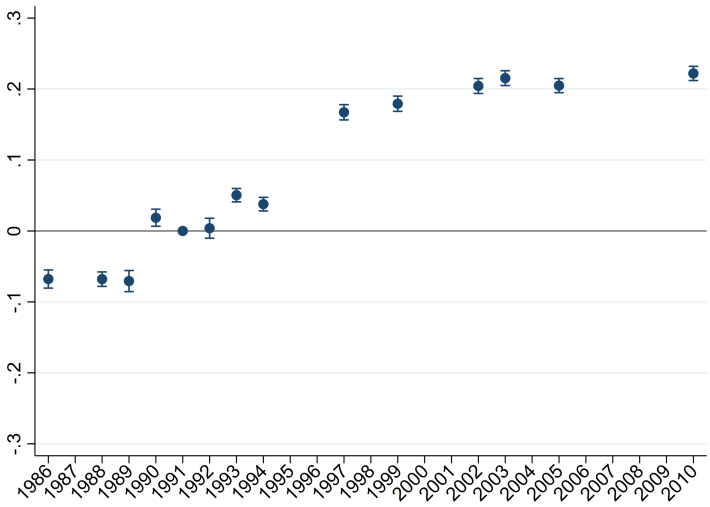
(b) SSDI/SSI Recipiency Time Series



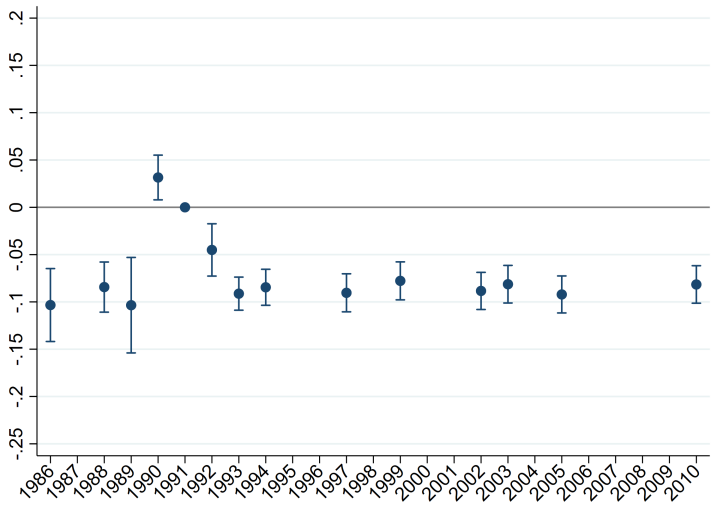
Note: This figure presents time series of OASDI and/or SSI recipiency (panel a) and SSDI and/or SSI recipiency (panel b) for the sample of men.

Figure A14: SIPP SSDI/SSI Recipiency Event Study by Disability Status (Women)

(a) Work Disabled



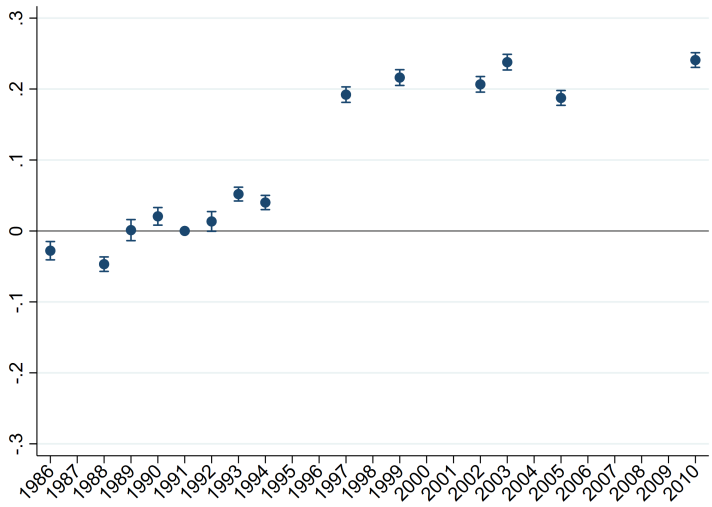
(b) Non-Work Disabled



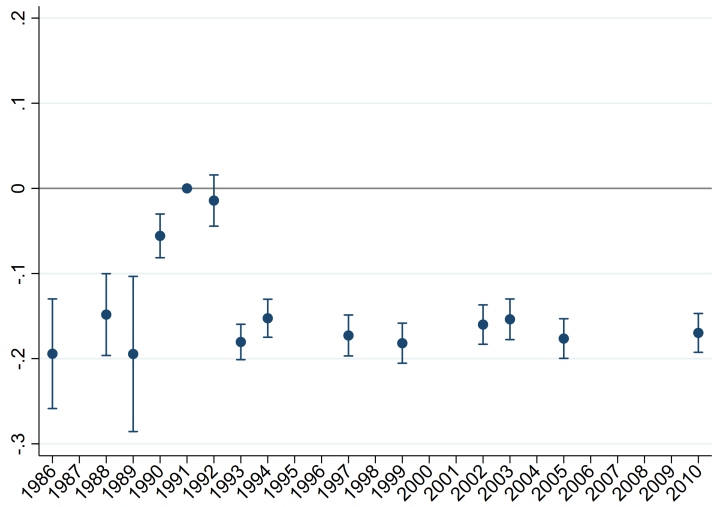
Note: This figure presents estimates from an event study specification like Equation 3, with SSDI and/or SSI recipiency as dependent variable, for the sample of women. The omitted group for both figures is individuals with no disability.

Figure A15: SIPP SSDI/SSI Recipiency Event Study by Disability Status (Men)

(a) Work Disabled



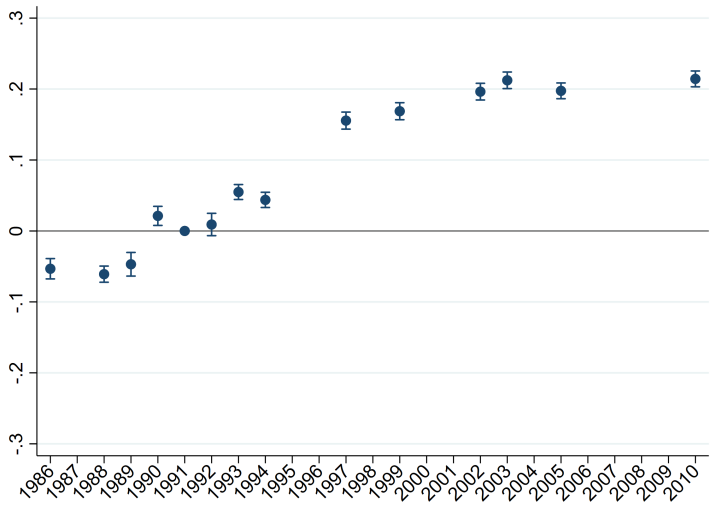
(b) Non-Work Disabled



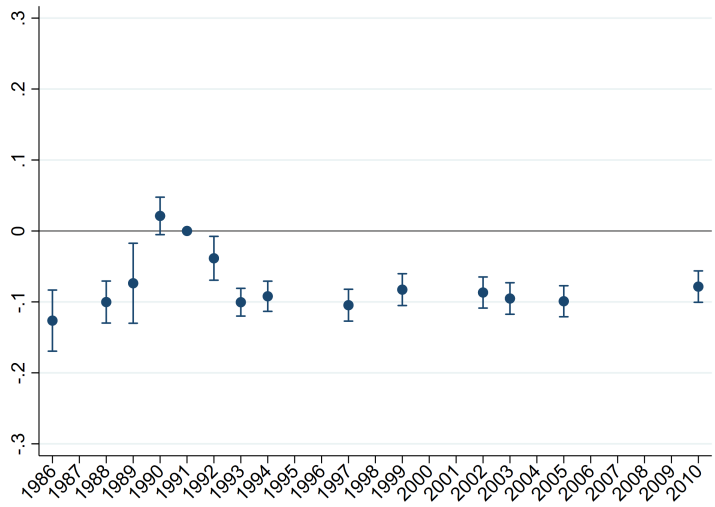
Note: This figure presents estimates from an event study specification like Equation 3, with SSDI and/or SSI recipiency as dependent variable, for the sample of men. The omitted group for both figures is individuals with no disability.

Figure A16: SIPP OASDI/SSI Recipiency Event Study by Disability Status (Women)

(a) Work Disabled

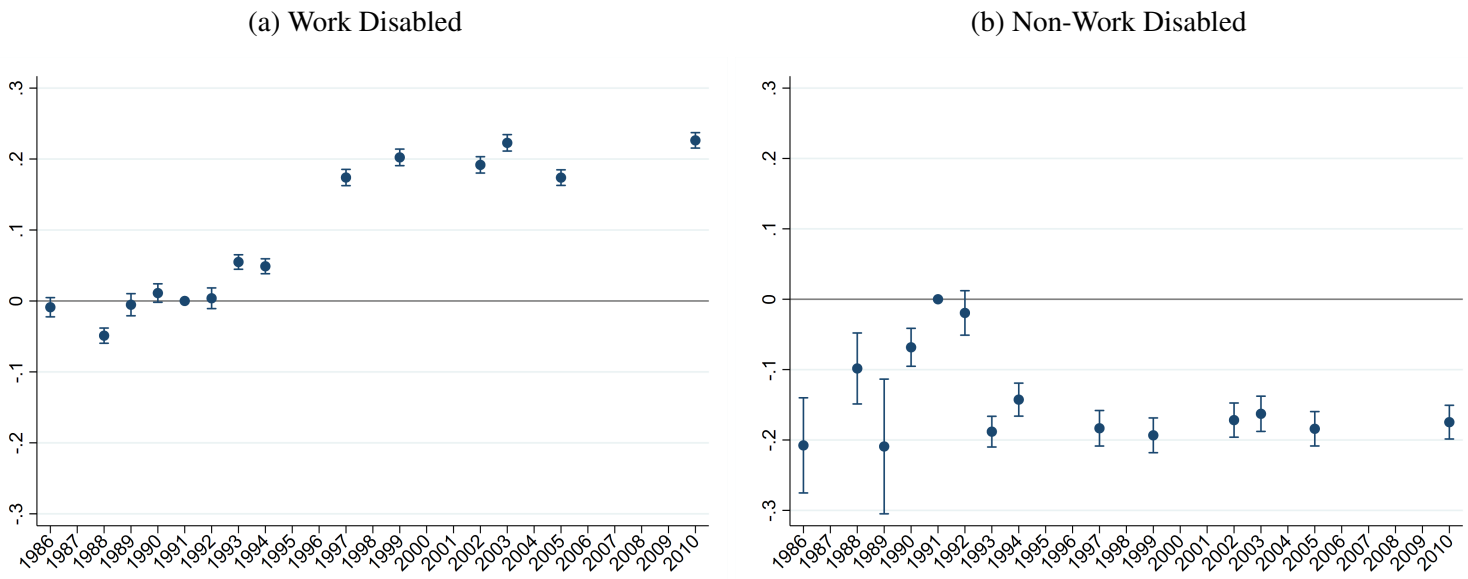


(b) Non-Work Disabled



Note: This figure presents estimates from an event study specification like Equation 3, with OASDI and/or SSI recipiency as dependent variable, for the sample of women. The omitted group for both figures is individuals with no disability.

Figure A17: SIPP OASDI/SSI Recipiency Event Study by Disability Status (Men)



Note: This figure presents estimates from an event study specification like Equation 3, with OASDI and/or SSI recipiency as dependent variable, for the sample of men. The omitted group for both figures is individuals with no disability.

C Employment Status Transition Rates

In this section we compare the rates of transition between employment and unemployment in our sample with those found in Menzio et al. (2016, MTV henceforth). We restrict the analysis to the 1996 SIPP panel, as done by MTV. Table A6 presents rates of transition from employment to unemployment (EU) and from unemployment to employment (UE). The first column displays rates we estimate without sample restrictions; the second column presents estimates from MTV, where the sample is restricted to men who graduated high school; the third column presents estimates from our sample implementing MTV's restrictions. While we are able to match the EU rate in MTV, we fail to replicate their UE rate. We also reproduce Table 1 from Appendix C in Krolikowski (2017) in Table A7, so as to provide a comparison with other data sets. We again find our UE rate to be lower than those found across data sets.

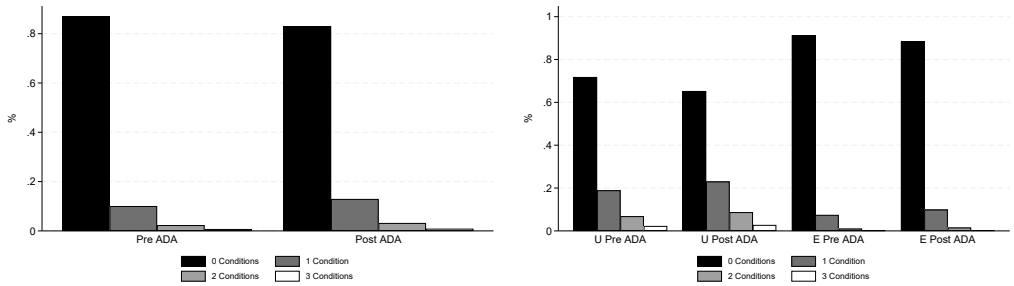
D Pseudo-Listing of Impairments

In SIPP, respondents can report limiting conditions in follow-up questions triggered by a report of (i) limitations to (instrumental) activities of daily living, (ii) work and non-work limitation, or (iii) poor health (self-reported). For each of these three, respondents can report up to three conditions out of the list of 30 conditions reported in Table A8.[25] The PLI (**P**seudo-**L**isting of **I**mpairments) column displays the mapping to the SSA's Listing of Impairments. The PLI expands the SSA Listing as the latter does not allow for an "Other" answer, nor does it classify alcohol/drug use disorders in any of its sections. Additions are denoted in red. We similarly map conditions from the JAN and EEOC websites to the PLI.

[25]The reason we do not use SIPP data before 1990 is that early panels do not contain the Functional Limitations and Disability Topical Module we rely on to obtain the conditions above. Early panels have a limited list of 23 conditions for questions in, for instance, the Work Disability History (WDH) module. We report the list of conditions available in WDH modules in the WDH column of Table A8.

Figure A18: Number of PLI Conditions Pre and Post ADA

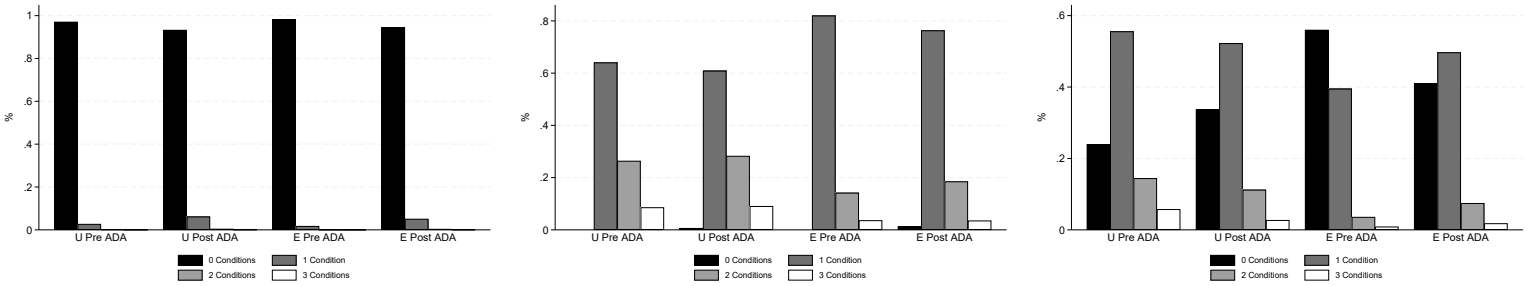
(a) Pooled (b) Employed and Unemployed



Note: This figure presents the share of respondents who report zero to four physical conditions from the Pseudo-Listing of Impairments. The left figure splits the sample into pre-ADA and post-ADA (1991 included and after). The right figure also conditions on employment status.

Figure A19: Number of PLI Conditions by Disability Group and Employment

(a) Not Disabled (b) Work Disabled (c) Non-Work Disability Only



Note: This figure presents the share of respondents who report zero to four physical conditions from the Pseudo-Listing of Impairments. Each figure considers a disability group separately, dividing individuals by employment status and pre/post ADA.

E Facts About Disability-Related Tax Provisions

From https://www.eeoc.gov/fact-sheet/facts-about-disability-related-tax-provisions.

E.1 Disabled Access Tax Credit

(Title 26, Internal Revenue Code, Section 44)
This new tax credit is available to "eligible small businesses" in the amount of 50 percent of "eligible access expenditures" that exceed $250 but do not exceed $10,250 for a taxable year. A business may take the credit each year that it makes an eligible access expenditure. Eligible small businesses are those businesses with either:

> *$1 million or less in gross receipts for the preceding tax year; or 30 or fewer full-time employees during the preceding tax year.*

Eligible access expenditures are amounts paid or incurred by an eligible small business for the purpose of enabling the business to comply with the applicable requirements of the Americans with Disabilities Act (ADA). These include amounts paid or incurred to:

> *remove architectural, communication, physical, or transportation barriers that prevent a business from being accessible to, or usable by, individuals with disabilities; provide qualified readers, taped texts, and other effective methods of making materials accessible to individuals with visual impairments; provide qualified interpreters or other effective methods of making orally delivered materials available to individuals with hearing impairments; acquire or modify equipment or devices for individuals with disabilities; or provide other similar services, modifications, materials or equipment.*

Expenditures that are not necessary to accomplish the above purposes are not eligible. Expenses in connection with new construction are not eligible. "Disability" has the same meaning as it does in the ADA. To be eligible for the tax credit, barrier removals or the provision of services, modifications, materials or equipment must meet technical standards of the ADA Accessibility Guidelines where applicable. These standards are incorporated in Department of Justice regulations implementing Title III of the ADA (28 CFR Part 36; 56 CFR 35544, July 26, 1991).
Example: Company A purchases equipment to meet its reasonable accommodation obligation under the ADA for $8,000. The amount by which $8,000 exceeds $250 is $7,750. Fifty percent of $7,750 is $3,875. Company A may take a tax credit in the amount of $3,875 on its next tax return.
Example: Company B removes a physical barrier in accordance with its reasonable accommodation obligation under the ADA. The barrier removal meets the ADA Accessibility Guidelines. The company spends $12,000 on this modification. The amount by which $12,000 exceeds $250 but not $10,250 is $10,000. Fifty percent of $10,000 is $5,000. Company B is eligible for a $5,000 tax credit on its next tax return.

E.2 Tax Deduction to Remove Architectural and Transportation Barriers to Individuals with Disabilities and Elderly Individuals

(Title 26, Internal Revenue Code, section 190)

The IRS allows a deduction up to $15,000 per year for "qualified architectural and transportation barrier removal expenses." Expenditures to make a facility or public transportation vehicle owned or leased in connection with a trade or business more accessible to, and usable by, individuals who are handicapped or elderly are eligible for the deduction. The definition of a "handicapped individual" is similar to the ADA definition of an "individual with a disability." To be eligible for this deduction, modifications must meet the requirements of standards established by IRS regulations implementing section 190.

E.3 Targeted Jobs Tax Credit

(Title 26, Internal Revenue Code, section 51)

Employers are eligible to receive a tax credit up to 40 percent of the first $6,000 of first-year wages of a new employee with a disability who is referred by state or local vocational rehabilitation agencies, a State Commission on the Blind, or the U.S. Department of Veterans Affairs, and certified by a State Employment Service. There is no credit after the first year of employment. For an employer to qualify for the credit, a worker must have been employed for at least 90 days or have completed at least 120 hours of work for the employer. The previous TJTC program authorization, the result of a six-month extension under the Tax Extension Act of 1991 (Pub.L. 102-227), expired on June 30, 1992. The program has been reauthorized for an additional thirty (30) months by the Omnibus Budget Reconciliation Act of 1993 (Pub.L. 103-06, August 10, 1993, retroactive to July 1, 1992). The reauthorization is effective for employees who begin work for the employer after June 30, 1992.

F Evidence on Model Identification

In Figures A20 and A21, we present numerical evidence that our model is locally identified.

Table A1: SIPP and CPS Regression Samples Covariates Balance

	(1) CPS, 1987-1996	(2) SIPP, 1986-1997
22-29	0.25	0.25
30-39	0.32	0.32
40-49	0.26	0.26
50-58	0.17	0.17
White	0.85	0.86
Black	0.10	0.10
Other	0.05	0.04
Less than HS	0.14	0.15
HS	0.37	0.33
College	0.49	0.52
Work Disabled	0.07	0.10
N	709125	222271

Note: This table presents sample observables for the SIPP data used in estimation and the CPS data used in estimation by Acemoglu and Angrist (2001).

Table A2: List of SIPP Topical Modules Used

Topical Module	Panel	Wave	Interview Months
Health Status and Utilization of Health Care Services	1986	3	October 1986 – December 1986
	1987	6	October 1988 – January 1989
	1988	3	October 1988 – January 1989
Work Disability History	1986	2	June 1986 – September 1986
	1987	2	June 1987 – September 1987
	1988	2	June 1988 – September 1988
Functional Limitations and Disability	1990	3	October 1990 – January 1991
	1990	6	October 1991 – January 1992
	1991	3	October 1991 – January 1992
	1992	6	October 1993 – January 1994
	1992	9	October 1994 – January 1995
	1993	3	October 1993 – January 1994
	1993	6	October 1994 – January 1995
	1996	5	August 1997 – November 1997
	1996	11	August 1999 – November 1999
	2001	5	June 2002 – September 2002
	2001	8	June 2003 – September 2003
	2004	5	June 2005 – September 2005
	2008	6	May 2010 – August 2010

Note: This table displays the Topical Modules used in sample construction. Before 1990 the Functional Limitations and Disability Module did not exist, forcing one to use other modules to construct consistent disability data.

Table A3: Timing of Panels

Panel	First Interview	Last Interview	Wave 1 Eligible Households	Num. of Waves
1986	Feb. 1986	Apr. 1988	12,425	7
1987	Feb. 1987	May 1989	12,527	7
1988	Feb. 1988	Jan. 1990	12,725	6
1989	Feb. 1989	Jan. 1990	12,867	3
1990	Feb. 1990	Sep. 1992	19,800	8
1991	Feb. 1991	Sep. 1993	15,626	8
1992	Feb. 1992	May 1995	21,577	10
1993	Feb. 1993	Jan. 1996	21,823	9
1996	Apr. 1996	Mar. 2000	40,188	12
2001	Feb. 2001	Jan. 2004	50,500	9
2004	Feb. 2004	Jan. 2008	51,379	12
2008	Sep. 2008	Dec. 2013	52,031	16

Note: This table displays the timing of SIPP panels.

Table A4: Difference-in-Difference Estimates of Wage Effects of ADA (No Trimming): CPS and SIPP

	(1) CPS, 1987 - 1996	(2) SIPP, 1986 - 1997	(3) SIPP, 1986 - 2010
Work Disability	-0.449***	-0.266***	-0.266***
	(0.0190)	(0.0183)	(0.0175)
After 1991	0.113***	-0.0589*	-0.242***
	(0.0257)	(0.0298)	(0.0296)
Work Disability × After 1991	-0.0262	-0.104***	-0.165***
	(0.0207)	(0.0217)	(0.0193)
Observations	560134	149635	277202

Note: This table displays estimates from Equation 2 applied to wages in the CPS data of Acemoglu and Angrist (2001) and in SIPP data. This table differs from Table 4 in that wages are not trimmed.

Table A5: Difference-in-Difference Estimates of Wage Effects of ADA 1986-2010 (No Trimming)

	(1) All	(2) Male	(3) Female
Work	-0.269***	-0.269***	-0.271***
	(0.0175)	(0.0221)	(0.0253)
Non-Work Only	-0.187***	-0.182***	-0.113***
	(0.0314)	(0.0429)	(0.0421)
After 1991	0.101***	0.0475	0.196***
	(0.0353)	(0.0445)	(0.0511)
Work × After 1991	-0.165***	-0.206***	-0.119***
	(0.0193)	(0.0243)	(0.0279)
Non-Work Only × After 1991	0.0120	0.0133	-0.00483
	(0.0336)	(0.0458)	(0.0450)
Observations	277202	142381	134821

Regressions include year FE, demographics (age, race, education, and region), as well as demographics-year interaction terms.

Note: This table displays estimates from Equation 4. This table differs from Table 8 in that wages are not trimmed.

Table A6: Employment Transition Rates

	Our Data	Menzio et al. (2016, Section 1)	Our Data, Menzio et al. (2016) Sample Restriction
UE	17.1%	25%	15.8%
EU	0.4%	0.5%	0.5%

Note: This table displays employment transition rates in our data and in Menzio et al. (2016).

Table A7: Krolikowski (2017, Appendix C Table 1)

	PSID	SIPP	CPS
UE	22%	21-26%	20-30%
EU	0.8%	0.5-0.9%	0.9-2%

Note: This table displays transition rates in Krolikowski (2017).

Table A8: PLI

WDH	FLD	Condition	PLI
15	1	Alcohol or Drug Problem or Disorder	15
	2	AIDS or AIDS Related Condition (ARC)	14
1	3	Arthritis or rheumatism	1
2	4	Back or spine problems (including chronic stiffness or deformity of the back of spine)	1
3	5	Blindness or vision problems (difficulty seeing well enough to read a newspaper, even with glasses on)	2
	6	Broken bone/fracture	1
4	7	Cancer	13
	8	Cerebral Palsy	11
5	9	Deafness or serious trouble hearing	2
6	10	Diabetes	9
	11	Epilepsy	11
	12	Head or spinal cord injury	1
7	13	Heart trouble (including heart attack (coronary), hardening of the arteries (arteriosclerosis))	4
8	14	Hernia or rupture	1
9	15	High blood pressure (hypertension)	4
10	16	Kidney stones or chronic kidney trouble	6
	17	Learning disability	12
11	18	Lung or respiratory trouble (asthma, bronchitis, emphysema, respiratory allergies, tuberculosis or other lung trouble)	3
12	19	Mental or emotional problem or disorder	12
13	20	Mental retardation	12
14	21	Missing legs, feet, arms, hands, or fingers	1
16	22	Paralysis of any kind	1
17	23	Senility/Demential/Alzheimer's Disease	12
	24	Speech disorder	2
18	25	Stiffness or deformity of the foot, leg, arm, or hand	1
19	26	Stomach trouble (including ulcers, gallbladder or liver conditions)	5
20	27	Stroke	11
21	28	Thyroid trouble or goiter	9
22	29	Tumor, cyst or growth	13
23	30	Other	16

Note: This table displays the mapping from health conditions to the Pseudo Listing of Impairments (PLI). The numbers in the first two columns represent the number of each condition in Work and Disability History (WDH) and Functional Limitations and Disability (FLD) Topical Module flashcards. Respondents are asked to report (up to three) conditions if they report poor health or limitations in specific Topical Module questions.

Table A9: PLI Pre and Post ADA

	(1) 1990	(2) Post 1990	(3) U 1990	(4) U Post 1990	(5) E 1990	(6) E Post 1990
Musculoskeletal	0.07	0.09	0.14	0.19	0.05	0.06
Senses and Speech	0.01	0.02	0.02	0.03	0.00	0.01
Respiratory	0.01	0.01	0.03	0.03	0.01	0.01
Cardiovascular	0.02	0.02	0.05	0.05	0.01	0.01
Digestive	0.00	0.00	0.01	0.01	0.00	0.00
Genitourinary	0.00	0.00	0.01	0.01	0.00	0.00
Endocrine	0.01	0.01	0.02	0.03	0.00	0.01
Neurological	0.01	0.01	0.02	0.02	0.00	0.00
Mental	0.02	0.02	0.05	0.07	0.01	0.01
Cancer	0.00	0.01	0.01	0.01	0.00	0.00
Immune System	0.00	0.00	0.00	0.00	0.00	0.00
Alcohol/Drugs	0.00	0.00	0.01	0.01	0.00	0.00
Other	0.02	0.04	0.04	0.08	0.01	0.03
N	20872	349981	4779	80504	16093	269477

Note: This table displays the share of respondents recorded to have conditions belonging to each PLI condition. We divide the sample by pre-ADA (1990) and post-ADA (1991-2010), as well as by employment status.

Table A10: PLI Pre and Post ADA – Not Disabled

	(1) U 1990	(2) U Post 1990	(3) E 1990	(4) E Post 1990
Musculoskeletal	0.02	0.03	0.01	0.03
Senses and Speech	0.00	0.01	0.00	0.01
Respiratory	0.00	0.00	0.00	0.00
Cardiovascular	0.00	0.01	0.00	0.01
Digestive	0.00	0.00	0.00	0.00
Genitourinary	0.00	0.00	0.00	0.00
Endocrine	0.00	0.01	0.00	0.00
Neurological	0.00	0.00	0.00	0.00
Mental	0.00	0.00	0.00	0.00
Cancer	0.00	0.00	0.00	0.00
Immune System	0.00	0.00	0.00	0.00
Alcohol/Drugs	0.00	0.00	0.00	0.00
Other	0.01	0.02	0.00	0.02
N	3523	53981	14832	249093

Note: This table displays the share of respondents with no disability recorded to have conditions belonging to each PLI condition. We divide the sample by pre-ADA (1990) and post-ADA (1991-2010), as well as by employment status.

Table A11: PLI Pre and Post ADA for Work Disabled

	(1) U 1990	(2) U Post 1990	(3) E 1990	(4) E Post 1990
Musculoskeletal	0.53	0.53	0.60	0.54
Senses and Speech	0.07	0.07	0.06	0.07
Respiratory	0.08	0.08	0.07	0.06
Cardiovascular	0.19	0.15	0.10	0.11
Digestive	0.03	0.03	0.03	0.02
Genitourinary	0.03	0.02	0.01	0.01
Endocrine	0.07	0.09	0.05	0.06
Neurological	0.06	0.06	0.04	0.03
Mental	0.19	0.22	0.08	0.12
Cancer	0.04	0.04	0.02	0.03
Immune System	0.01	0.01	0.00	0.01
Alcohol/Drugs	0.03	0.02	0.01	0.01
Other	0.15	0.19	0.13	0.21
N	1097	24471	974	14595

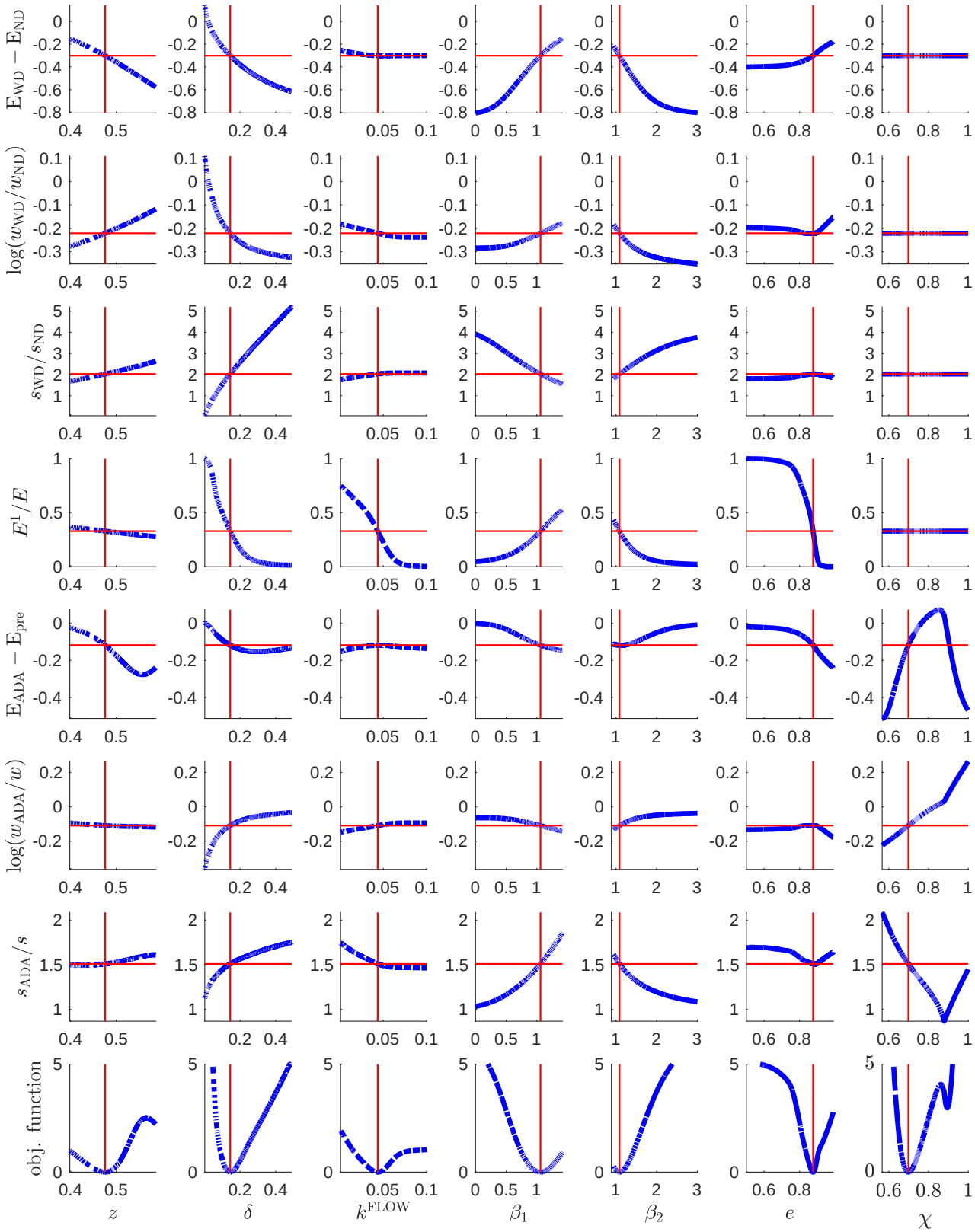
Note: This table displays the share of respondents with work disability recorded to have conditions belonging to each PLI condition. We divide the sample by pre-ADA (1990) and post-ADA (1991-2010), as well as by employment status.

Table A12: PLI Pre and Post ADA for Non-Work Disabled Only

	(1) U 1990	(2) U Post 1990	(3) E 1990	(4) E Post 1990
Musculoskeletal	0.33	0.35	0.23	0.34
Senses and Speech	0.07	0.05	0.01	0.05
Respiratory	0.06	0.05	0.08	0.04
Cardiovascular	0.14	0.08	0.04	0.06
Digestive	0.03	0.01	0.01	0.01
Genitourinary	0.03	0.01	0.00	0.01
Endocrine	0.03	0.04	0.03	0.03
Neurological	0.06	0.02	0.01	0.01
Mental	0.13	0.06	0.02	0.03
Cancer	0.02	0.02	0.01	0.02
Immune System	0.01	0.00	0.00	0.00
Alcohol/Drugs	0.00	0.00	0.01	0.00
Other	0.11	0.15	0.08	0.15
N	159	2052	287	5789

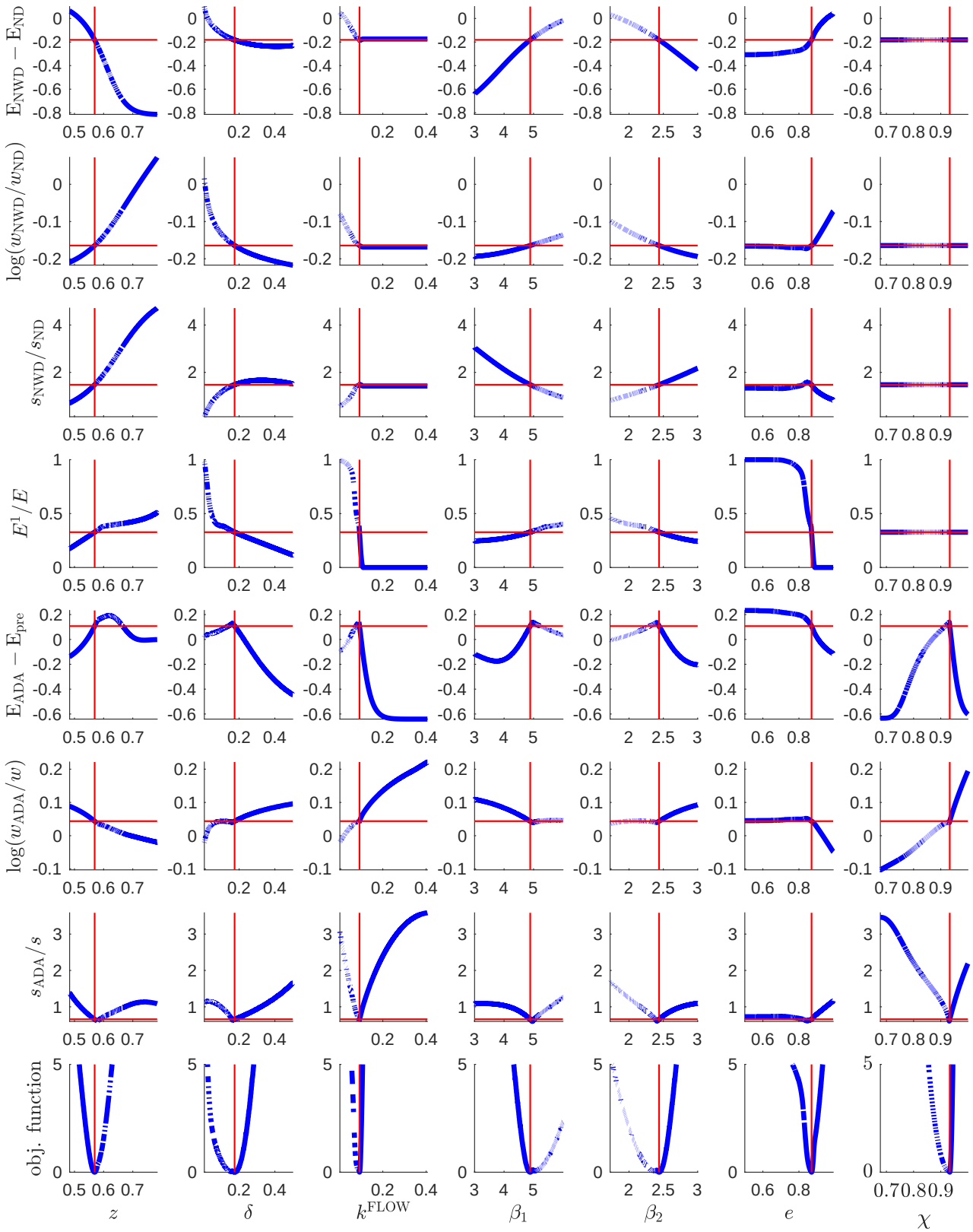
Note: This table displays the share of respondents with non-work disability only recorded to have conditions belonging to each PLI condition. We divide the sample by pre-ADA (1990) and post-ADA (1991-2010), as well as by employment status.

Figure A20: Evidence of Local Identification for Work Disabled Submarket



Note The objective function is $\Omega(\theta) = \sum_k \left([M_k(\theta) - M_k]/M_k\right)^2$, where $M_k(\theta)$ is the kth moment from the model calculated at the parameter vector θ and M_k is the kth data moment.

Figure A21: Evidence of Local Identification for Non-work Disabled Submarket



Note The objective function is $\Omega(\theta) = \sum_k \left([M_k(\theta) - M_k]/M_k\right)^2$, where $M_k(\theta)$ is the kth moment from the model calculated at the parameter vector θ and M_k is the kth data moment.