The Disability Discrimination Act in the UK: Helping or Hindering Employment Amongst the Disabled?*

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Abstract:

The enactment of the Americans with Disabilities Act (ADA) in 1990 triggered a substantial academic debate about its consequences on employment rates of disabled people. In contrast, the employment provision of the 1996 Disability Discrimination Act (DDA) in Britain has received little attention. This paper provides robust evidence that, similar to the ADA in the US, the DDA has had no impact on the employment rate of disabled people or possibly worsened it. Possible reasons for this are low take-up of financial support, low levels of general awareness about the Act among disabled people and employers, and limited knowledge about the true costs of required adjustments.

Keywords: Disability, Employment, Difference-in-Difference, Discrimination

JEL Classification: J2, I18, J71, J78

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Introduction

In 1995 the UK Government passed the Disability Discrimination Act (DDA). Its intention was to end discrimination against disabled people. It aims to protect people in the areas of employment, access to goods, facilities and services, the management, buying or renting of land or property and education. Under Part II of the Act, which came into force in December 1996, it is unlawful for employers covered by the Act to discriminate against disabled employees. Similar to the Americans with Disabilities Act (ADA) which was introduced in 1990, the employment provision of the DDA aims to overcome barriers to employment for disabled people. It was hoped that the additional rights under the DDA would significantly increase the probability that disabled people obtained and remained in employment. But critics pointed out that the additional costs imposed by the legislation (*hiring and firing*) might lower employment rather than raise it.

The theoretical impact of anti-discrimination legislation is ambiguous. By giving them additional rights, disabled people are more likely to supply labor. But higher expected costs may dissuade employers from hiring disabled employees. In the absence of efficient enforcement mechanisms, employers will seek to avoid such extra costs. Such enforcement can either be formal (through tribunals and courts) or informal (name and shame).

The ADA has sparked a large body of economic studies on its effects. DeLeire (2000, 2003) claims that it decreased employment rates for disabled men on average by 7.2 percent compared to the pre ADA period. Yet, there has been no change in male wages post legislation. Acemoglu and Angrist (2001) find a strong decline in hours worked shortly after the introduction of the ADA for men of all working ages and women under 40. Only part of this can be explained by an increase in disability

related income transfers. Furthermore, consistent with the ADA, measured effects are larger in medium-sized firms possibly because small firms were exempt. Finally, Jolls and Prescott (2004) disaggregate the different effects of the ADA and show that accommodation costs for disabled people account for much of the decline in employment rates. However, differential ADA effects across states suggest that declining employment rates for disabled people after the immediate post ADA period reflect factors other than the ADA itself.

Disability measures based on self-reported work limiting health problems may suffer from several shortcomings (Kruse and Schur 2003). If, for example, people with disabilities are able to access better jobs, they may no longer define themselves as having a work-limiting disability. Furthermore, a substantial proportion of those reporting a work disability may not be covered by the ADA disability definition. Finally, empowering disabled people with more rights may remove the associated stigma and therefore increase willingness to report disabilities. Each of these issues is likely to impact on the measured employment rate of disabled people. Nevertheless, Burkhauser, Daly, Houtenville and Nargis (2002) argue that differences in trends in self-reported work limitation and in health impairments data from US employment surveys are insignificant.

Employment Provisions of Discrimination Legislation in the UK

The Disability Discrimination Act 1995 introduced measures to prevent discrimination against disabled people. It defines a *disabled* person as a person with a physical or mental impairment which has a substantial and long-term adverse effect on his/her ability to carry out normal day-to-day activities. Part II of the DDA which came into force in December 1996 is based on the principle that disabled people

should not be discriminated against in employment or when seeking employment. Under the Act, employers are expected to make *reasonable* adjustments if their employment arrangements or premises place disabled people at a substantial disadvantage compared with non-disabled people. This includes the provision of auxiliary aids or services. However, there was no anticipatory duty to make these adjustments under the legislation. The Act originally covered employers with more than 15 employees. From October 2004 this exemption was removed and all employers regardless of their size are covered.

The Act therefore imposes prospective additional costs on employers. First, the expected cost of hiring and firing of disabled people is increased due to the increased probability of lawsuits. Second, employing a disabled person may require costly alterations of the physical features of the workplace. Furthermore, it may be efficient for firms and employees to share investments in specific human capital (DeLeire 2000). This however, is no longer possible under the DDA because of the requirement that disabled workers receive equal pay. On the other hand, the Act reduces barriers to employment and opportunity costs for disabled people which may increase their labour supply. Hence, whether anti discrimination legislation increases or hampers the labour market participation of disabled people is foremost an empirical question.

It is important to note that the DDA is not the sole policy instrument aimed at increasing the employability of disabled people. In 1994 a scheme called *Access to Work* (AtW) brought together various older disability programmes. Access to Work aims to assist disabled people who are in paid employment or with a job to start by providing practical support and helping to meet *unreasonable* additional costs associated with overcoming work-related obstacles resulting from disability. This may encompass adaptations to premises and equipment, employment of support workers,

special aids and equipment, or communication support at job interviews. Access to work, however, is not pro-active and a disabled person needs to have an employer in order to be eligible for help. There have been several changes to the programme over the years including different cost sharing arrangements between government and employer (Thornton et al. 2001). The UK Government has also introduced further measures to increase the incentives of disabled people to become employed. These include the Disabled Person's Tax Credit and the New Deal for Disabled People (NDDP). Both measures are intended to increase incentives for disabled people to seek employment by providing tax relief and tailored advice. Finally, the Department for Work and Pensions has a performance target to increase the employment rate of disabled people and reduce the difference between their employment rate and the overall employment rate by 2007 as part of its Public Service Agreement with the Treasury.

Data and Definition of Disability

The main analysis in this paper is based on the first twelve waves (1991-2002) of the British Household Panel Study (BHPS). For each wave, over 5,000 households consisting of roughly 10,000 individuals were interviewed. The BHPS offers a wide range of variables and is nationally representative. For the purpose of our analysis only individuals who are aged 16 to 64 (59 for women), not working for the armed forces or in self-employment and residing in England have been included.

Labour market participation is defined by whether an individual has done paid work in the week prior to the interview or has not done paid work but has had a job from which they were absent.

To test the robustness of our results, we repeat the analysis with data from the Family Resources Survey (FRS) for 1994/94 to 2002/03. The FRS is a continuous cross-sectional survey with an annual target sample size of 24,000 private households (25,000 prior to April 1997). Its advantage is its much larger sample size compared to the BHPS. Unfortunately, this larger size has to be traded off against a more restricted set of controls and its lack of any longitudinal component. The FRS sample was restricted in a similar fashion to the BHPS to maximise comparability between the analyses.[1]

Clearly, any meaningful evaluation of the DDA and its impact on employment rates of disabled people requires a measure of disability which complies with the disability definition in the legislation. Unfortunately, such a measure does not exist in any available survey that would allow a comparison of pre- and post DDA employment effects. The Labour Force Survey (LFS) and the FRS have recently introduced a DDA disability question. However, while these questions are likely to cover currently DDA disabled, they will not capture former DDA disabled which also come within the ambit of the Act. Hence, these questions do not guarantee full coverage of those affected by the legislation. Furthermore, the order of the disability questions in the LFS has changed since 1997 which makes it difficult to compare pre- and post effects. The BHPS has two broad disability questions:

[1] Differences mainly occur in terms of education. This has been proxied using the full-time education leaving age which is available for all waves. More recently more detailed education variables have been added to the FRS. The survey also does not distinguish between individuals who have not done paid work during the week prior to the interview.

Does your health limit the type of work or the amount of work you can do?

and

Does your health in any way limit your daily activities compared to most people of your age?

where the first is usually referred to as work limiting disability (WLD) and the second identifies limitations in day-to-day activities (DALD). The former is the sort of question used in studies of the ADA. The latter is closer to the DDA definition except that it does not establish whether the disability is longstanding. Both questions have been asked in all waves other than wave nine. For some of our analysis we use a proxy value for 1999. [2]

In the FRS, there are two additional disability questions, namely a longstanding illness (LSI) and a limiting longstanding illness question (LLSI). These questions are:

Do you have any long-standing physical or mental illness, health problem or disability? By long-standing I mean anything that has troubled you over a

[2] The proxy variable has been derived in the following manner to be able to use all 11 waves. If individuals are answering "yes" to "Does your health in any way limit your daily activities compared to most people of your age?" in the preceding and succeeding year (wave 8 or 10) it is assumed that they are also disabled in wave 9. Similarly, if they answer "no" in wave 8 and 10, it is assumed they would do so in wave 9 as well. In all other cases where answers differ in wave 8 and 10, if the answer is "yes" to the related wave 9 specific question "Being limited in the kind of work or other activities?" individuals are assumed to be disabled.

period of time or that is likely to affect you over a period of time? Please include problems that are due to old age.

and if so, a follow-up question it put to the individual to determine whether the health problem is limiting

Does this physical or mental illness or disability (Do any of these physical or mental illnesses or disabilities) limit your activities in any way?

Hence, LLSI comprises a sub-group of LSI individuals. Note that the latter does not specify the activities and the reference group as does the DALD.

One advantage of surveys such as the LFS and FRS is that they not only have a DDA but also a work limiting disability question which makes it possible to establish the overlap between the two. There is conclusive evidence that work limiting and DDA disability in the LFS overlap by more than 93 percent (DWP 2004). Our analysis reveals that WLD and DALD in the BHPS overlap by more than 94 percent in the period 1991 to 2002. Thus, given that the LFS and BHPS questions are very similar, there is good reason to believe that by using the BHPS variable a very good, but not perfect, coverage of the DDA population can be achieved. The same applies to the two FRS questions.

Hence, so that our analysis is as robust as possible, four different measures of disability are used, namely WLD, DALD, LSI, and LLSI. Given the nature of the questions asked in the two surveys, our analyses is much more likely to capture the relevant population covered by disability legislation compared to U.S. studies.

Analysis and Results

As mentioned in the introduction, anti discrimination legislation may affect the reported number of disabled people in various ways. On the one hand the willingness to declare a health problem may have increased due to the extension of rights and public awareness. On the other hand, if the Act met its objective and strengthened the employability of disabled people fewer might declare themselves as being disabled once they have obtained jobs (Kruse and Schur 2003). Hence, the net effect on self-reported disability in the aftermath of the DDA is a-priori ambiguous.

Figure 1 depicts the four disability measures from 1991 to 2002 for England. On average the prevalence of disability in the working age population ranges from 10 (DALD) to 25 percent (LSI). While DALD, WLD, and LLSI have evolved similarly over time (with the somewhat puzzling exception of 1996), LSI increased from 1994/95 to 1998/99 and since then has fluctuated substantially. This may be due to the cross-sectional nature of the FRS and to changes in the interpretation of the relevant question which does not specify the time period over which disability is to be judged.

< Figure 1 about here>

It appears therefore that in the post DDA period, the percentage of disabled among the working population has been flat or falling for WLD, DALD, and LSSI while LSI has risen. In the immediate post-enactment period WLD was fairly constant, DALD and LLSI increased slightly and LSI continued its upward trend.[3] Whether any of these

[3] The dip and successive increase in LLSI between 1995 and 1997 seems rather sample driven given that none of the other indicators decreases in 1996.

changes results from the introduction of the Act cannot be determined from a simple examination of aggregate trends. It might, for example, be possible that the increase in the pre DDA period was anticipatory and by 1997/98 had reached its “equilibrium” level. But the increase could be due to a genuine increase in the number of disabled people in the population and not linked to the legislation. In general, it only seems safe to conclude from Figure 1 that there is no obvious break in the any of the series after the introduction of the DDA which would indicate a significant aggregate shift in rates of self-reported disability.

Figure 2 reports relative employment rates of disabled people in England. Clearly, there is some degree of variation by disability measure. In the early 1990’s only the WLD and DALD are available. Both start relative high, fall thereafter and increase again in more recent years. However, there was also a distinct peak just before the introduction of the DDA in 1996 followed by a sharp drop in employment rates in the immediate post DDA year. This is particularly pronounced for the WLD measure. Interestingly, people who report work disabilities have a systematically higher employment rate compared to people reporting limitations to daily activities. General unemployment rates fell between 1993 and 1996 and since then have fallen further. With low unemployment and stable or gradually falling inflation, the DDA was introduced in a very favourable macro economic environment. In particular, employment rates were growing strongly over the period.

Employment rates of the disabled as measured by the FRS are distinctly different. While both LSI and LSSI follow roughly the same trend over time, the gap between the two measures is about 20 percent. Similar to the trends with the BHPS questions, the relative employment rates of the LSI and LSSI have risen since 1995, though the

rate of increase slows after 1996. Hence, while WLD and DALD show a decline in the immediate post-DDA period, LSI and LSSI merely level off.

<Figure 2 about here>

In the American literature, Kruse and Schur (2003) find that more people reported work disabilities following the introduction of the ADA. They also show that disabled workers are more exposed to labour market downturns and to the LIFO (last in, first out) procedure. While there is thus some evidence that the employment of disabled people is pro-cyclical, their results were highly sensitive to the definition of disability used. Similarly, it is not clear that any of the observed trends in our data are linked to the introduction of the DDA.

Going beyond examination of trends, we now describe a more sophisticated examination of the factors influencing the probability of employment among disabled people in England. The theoretical justification for our model stems from the Acemoglou and Angrist (2001) argument that the general equilibrium effects of disability legislation on the employment rates of the disabled are ambiguous. Employers' hiring decisions will be influenced not only by the supply price of disabled labour, which may be affected by disability legislation, and also by hiring and termination costs, which depend on, for example, the willingness of the disabled to sue if they are not hired and on the additional costs of providing accommodation and assistance to the disabled. We apply a difference-in-difference analysis to model the probability of employment among disabled people using individual data from both the BHPS and the FRS. Our reduced-form specification is:

$$p_{it} = \theta' x_i + \alpha D_i + \gamma_t D_t + \varepsilon_{it} \quad (1)$$

where x_i is a vector of individual characteristics of individual i (age, gender, children, house ownership, household size, education, marital status and region) and D_i is a dummy variable measuring disability status. The coefficients on the characteristics are given by the vector θ, while α measures the disability main effect and γ is a vector of time-varying disability effects, which captures the difference-in-difference effects. Table 1 and Table 2 report summary statistics for the overall samples as well as the four self-identified disability groups. As mentioned previously, within the BHPS sample, differences between the two disability measures are negligible. In contrast, the distributions of the two FRS disability measures are substantially different. In general disabled people are older, less well educated (leave education younger), more likely to be married, less likely to own property and to have children and live generally in smaller households.

< Table 1 about here>

< Table 2 about here>

The DDA was passed in 1995 and came into force in December 1996. In terms of our data, the post DDA period is therefore defined from 1997 onwards given that BHPS interviews take place between September and April and FRS interviews are carried out between April and March of the following year. Since neither the WLD nor the DALD question were asked in 1999, the post-DDA period is 1997 to 1998 for the WLD and either 1997 to 1998 or 1997 to 2002 for the DALD, depending on whether

the 1999 proxy disability variable is used. In contrast, the FRS is available for the full period between 1994/95-2002/03.

Table 3 reports predicted changes in employment based on pooled probit estimations using variants of Equation (1). Robust standard errors have been reported for non-interaction terms and estimations have been clustered in order to account for repeated observations. We account for the non-linearity inherent in probit models and consequent difficulty of interpreting interaction effects using a method suggested by Ai and Norton (2003) and previously used by DeLeire (2000).

Six models have been estimated using DALD as the disability variable. Model (1) only includes a disability dummy, a post DDA dummy and the difference-in-difference variable. This specification suggests that the employment rate of disabled people has fallen on average by a statistically significant 3.5 percent in post-DDA years 1997 and 1998. The effect does not change when regional effects are included in the specification. However, when the remaining individual characteristics such as age, gender, children, house ownership, household size, education, and marital status are included, the predicted probability of change in employment becomes insignificant. This result therefore seems inconclusive.

<Table 3 about here >

Models (4) to (6) replace the single difference-in-difference post-DDA measure with year indicator variables which permit the results to be expressed as changes relative to 1996, the year in which the DDA came into operation. While for post DDA years the change in employment is negative, none of these effects is statistically significant. Further and similar to the US findings (DeLeire 2000, Acemoglu and Angrist 2001)

the main effect of disability on employment probabilities is strongly negative in all models.

The negative effect on employment is even larger when the WLD measure is used. Table 4 again reports changes in employment for six different model specifications. The post DDA variable indicates a drop in employment by up to 4.5 percent and is highly significant. In contrast to Table 3, replacing the post DDA period variable with year indicators yields significantly negative results for 1998 where the employment rate of disabled people is reduced by up to 4 percent compared with 1996.

< Table 4 about here >

As described above, neither disability question was asked in the 1999 BHPS. However, as described earlier, we used related questions to construct a proxy for the DALD variable. Thus Table 5 reports results similar to Table 3 for the longer period 1991 to 2002.While the interaction terms remain negative, none is statistically significant which is not surprising given the recovery in employment rates among disabled people in more recent waves of the BHPS.

Thus, difference-in-difference analysis suggests a 0 to 3 percent fall in the probability of employment in the post-DDA period, while the aggregate trends merely show that employment rates of disabled people in the years since the introduction of the legislation have levelled off.

< Table 5 about here >

Note that the main results do not change when using a balanced rather than an unbalanced panel. Furthermore, given the differences in unconditional relative employment rates (Figure 1), the FRS sample has been used to check the robustness of the BHPS results. Table 6 and Table 7 report results for the LSI and LLSI respectively based on the same model specifications as in Table 3 to Table 5. In contrast to the BHPS data, one would expect to see a significant increase in employment amongst disabled people post DDA from Figure 2. However, we find only a small 1 percent increase in employment for the basic model specifications (1) and (2) using the LSI definition and the rise seems mainly driven by an increase in employment in 2002. This also holds true to a lesser extent for the LLSI definition. For all other specifications there is no evidence of a significant expansion of employment amongst disabled people.

<Table 8 to Table 10 about here>

A common criticism of these models is that self-reported disability may be endogenous, and in particular, partly determined by employment status. It is argued that people are less likely to report being disabled once they are employed. Table 8 reports a transition matrix for DALD and employment status for the overall sample.[4] Around 7.5 percent of individuals describing themselves as disabled in one year are employed in the following year. Of these almost 52% also change disability status. It

[4] The DALD definition has been chosen rather than WLD because the former is said to be less prone to sudden switches of disability status following changes in the employment circumstances. Yet, we find very little difference between the two definitions with regard to status switches.

is not possible from this information to assess whether there is any causal link or whether the employment status change precedes the change in disability status. However, it has been argued that these switches may artificially understate the employment rate of disabled people in the type of stock analysis undertaken above. If the introduction of the DDA has led to an additional disproportional increase in these switches, this may then explain the observed decrease in employment rates. Table 9 to Table 10 report the same transition matrix for the pre- and post-DDA period. In fact, there was a slight, and probably insignificant, decrease in the proportion of switchers who subsequently describe them selves as not disabled once they have entered employment. This suggests that there is no evidence of an increase in the proportion of disability status switches that coincide with moves into employment in the post-DDA phase. While this result is merely descriptive, it nevertheless suggests that the decline in the observed employment rates is unlikely to be driven by switches out of disability status.[5]

In general, changes in disability status seem to be more likely the less severe the disability, i.e. the lower are the adjustment costs for employers. Kruse and Schur (2003) have argued that more people reported work related disabilities following the introduction of the ADA. Figure 1 seems to suggest that this has also been the case post DDA. Hence, it is somewhat surprising that the number of switchers has stayed constant or even declined and it is consistent with a rise in the incidence of severe disabilities.

[5] Further robustness checks have been done by moving the cut-off point for pre- and post-DDA period, however, the main results do not change significantly.

Implications and Conclusions

There is some evidence that employment rates of disabled people have fallen in the aftermath of the enactment of the Americans with Disabilities Act (ADA) in 1990. Over a decade later, the cause of the decrease has not been fully explained. However, recent evidence seems to show a causal link between the ADA and the fall in employment. It has been suggested that most of this decline has been due to worksite accommodation costs imposed on employers when employing disabled people. It may be that the US has not satisfactorily resolved the problem of paying for adjustment costs. Though firms can cover extra costs through a tax credit system, this may not be effective in fully offsetting ongoing accommodation and assistance costs.

In the UK, these costs are more easily offset through the Access to Work scheme (AtW) which allows employers to recover part or the full amount of unreasonable adjustment costs for a maximum period of three years. This limit may be extended, depending on individual circumstances. Hence, one might expect expenses for adjustments to play a smaller role in reducing the employment of disabled people than in the USA. Nevertheless, the evidence in this paper suggests that the DDA resulted in a decline or, in the best case, in a levelling off in employment rates of disabled people in the immediate post-DDA period. This trend may have reversed in 2002 and comes despite the fact that general awareness of the legislation among employers is still low (DWP, 2004).

One explanation may be the low take-up of AtW. Between 1994/95 and 2003/04 it increased from around 7,000 to 24,500 – a tiny proportion of the 6.9 million working age DDA disabled in Britain. At the same time employment tribunal cases have increased since 1996 from 17 to over 2,300 in 2000. Most of these cases were made in relation to dismissals: only a very small fraction concerned recruitment (DWP, 2002).

This suggests that costs of employment termination may be high as a consequence of the DDA with an average award for pecuniary losses of £9,841 in 2000. It also suggests that the legislation may mainly be enforced when employment is terminated. On the other hand, there is also evidence that employed disabled people are more likely to be aware of their rights compared with the non-employed. This may explain the imbalance between recruitment and dismissal cases as the first to exercise their rights were those who were actually employed when the DDA was passed. It also seems reasonable to assume that enforcement of the Act is to a certain degree easier in cases of unfair dismissal when a well-established working relationship comes to an end compared to decisions around recruitment which require a comparison of the various candidates and a definitive assessment of their suitability for the particular job which is often taken under a veil of ignorance and uncertainty.

UK government research has shown that employers who do invest in disabled people by making adjustments to the workplace often find that the actual costs are low. This suggests that it is not actual costs but perceived costs that are more influential. Yet, there is no conclusive evidence whether this is mainly a selection effect or reflects genuine misperception among employers.

Adverse effects of anti discrimination legislation which imposes additional costs on employers will always trigger a certain degree of avoidance. However, avoidance is also a direct consequence of a lack of enforcement and supportive policies. In Britain, policies are in place and have been for some time even before the DDA was introduced which support the employment of disabled people. However, take-up and awareness seem to be low. Secondly, enforcement of legislation is only as effective as the specific awareness among involved parties about their rights and duties. Nearly a decade after the Act was passed this awareness still seems to be low.

References:

Acemoglu, D., Angrist, J.D. (2001). Consequences of Employment Protection? The Case of the Americans with Disabilities Act. Journal of Political Economy, 109: 915-957.

Ai, C., Norton, E. (2003) Interaction terms in logit and probit models. Economics Letters, 80: 123-129

Burkhauser, R. Daly, M., Houtenville Nargis, N., (2002) The Employment of Working-Age People with Disabilities in the 1980s and 1990s. What Current Data Can and Cannot Tell Us, Demography, 39(3): 541-555.

Chay, K. (1998). The Impact of Federal Civil Rights Policy on Black Economic Progress: Evidence from the Equal Employment Opportunity Act of 1972, Industrial and Labor Relations Review, 51: 608-632.

DeLeire, T. (2000). The Wage and Employment Effects of the Americans with Disability Act. Journal of Human Resources, 35: 693-715.

Donohue, J., Heckman, J. (1991). Continuous Versus Episodic Change: The Impact of Affirmative Action and Civil Rights Policy on the Economic Status of Blacks, Journal of Economic Literature 29: 1603-1644.

DWP (2002). Monitoring the Disability Discrimination Act 1995 (Phase 2). In-house Report 91

DWP (2004). Disability in the workplace: Employers' and service providers' responses to the Disability Discrimination Act in 2003 and preparation for 2004 changes. Research Report 202

DWP (2004). Review of Disability Estimates and Definitions. In-house Report 128

DWP and ONS (2004). Social Survey Division and National Centre for Social Research, *Family Resources Survey, 2002-2003* [computer file]. *2nd Edition.* Colchester, Essex: UK Data Archive [distributor] SN: 4803.

Jolls, C., Prescott, J.J. (2004). Disaggregating Employment Protection: The Case of Disability Discrimination. NBER Working Paper 10740.

Jones, M.K., Latreille, P.J., Sloane, P.J. (2003). Disability, Gender and the Labour Market. IZA Discussion Paper 936.

Kidd, M.P., Sloane, P.J., Ferko, I. (2000). Disability and the Labour Market; An Analysis of British Males. Journal of Health Economics, 19: 961-981.

Kruse, D., Schur, L. (2003). Employment of People with Disabilities Following the ADA. Industrial Relations, 42(1): 31-66.

Oyer, P., Schaefer, S. (1999). Layoffs and Litigation. Unpublished Manuscript. Evanston: Kellogg Graduate School of Management, Northwestern University.

Thornton, P., Hirst, M., Arksey, H. (2001). User's view of access to work. SPRU

Thornton, P., Zeitzer, I., Bryere, S.M., Golden, T.P., Houtenville, A.J. (2003). What works and looking ahead: A comparative study of UK and US policies and practices facilitating return to work for disabled people with disabilities. http://www.york.ac.uk/inst/spru/pubs/pdf/UKemploydisabledplp.pdf

Appendix

Figures and Tables

Figure 1: Percentage of disabled working age population in England, BHPS 1991-2002, FRS 1994/95-2002/03

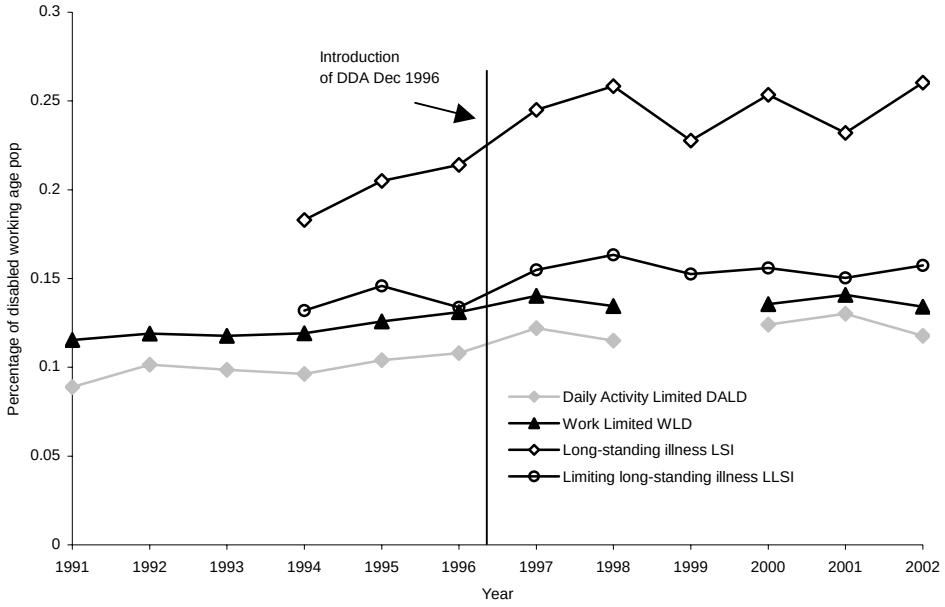

Figure 2: Relative employment rates for two disability measures in England, BHPS 1991-2002, FRS 1994/95-2002/03

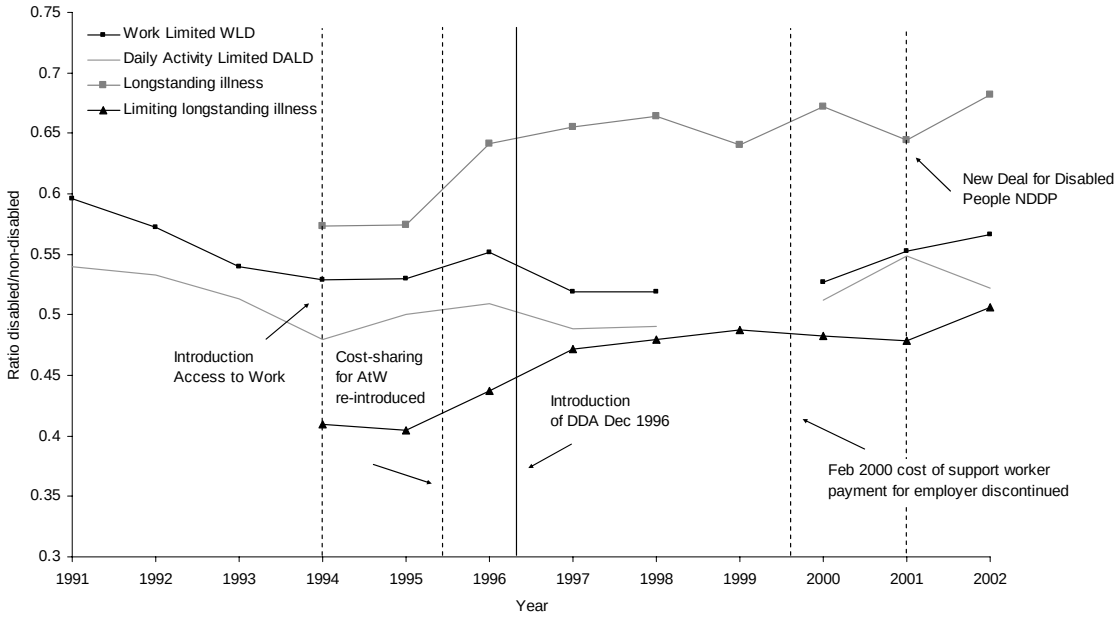

Table 1: Descriptive Statistics, BHPS 1991-1998 (England)

	All		ALD		Non ALD		WLD		Non WLD	
	Mean	Std-Div	Mean	Std-Div	Mean	Std-Div	Mean	Std-Div	Mean	Std-Div
Participation	0.7221	0.4480	0.3908	0.4880	0.7602	0.4270	0.4205	0.4937	0.7650	0.4240
Age	36.55	12.65	43.24	12.73	35.78	12.41	43.48	12.76	35.56	12.32
Male	0.4662	0.4989	0.4546	0.4980	0.4676	0.4990	0.4715	0.4992	0.4655	0.4988
Married	0.5558	0.4969	0.6177	0.4860	0.5487	0.4976	0.6226	0.4848	0.5463	0.4979
Higher degree	0.0192	0.1372	0.0111	0.1050	0.0201	0.1404	0.0112	0.1053	0.0203	0.1411
Degree	0.1521	0.3591	0.0858	0.2802	0.1597	0.3663	0.0892	0.2851	0.1611	0.3676
A-level	0.1851	0.3884	0.1245	0.3302	0.1921	0.3940	0.1256	0.3314	0.1935	0.3951
O-level	0.3786	0.4850	0.2910	0.4543	0.3887	0.4875	0.2925	0.4549	0.3909	0.4880
House owned	0.7202	0.4489	0.6136	0.4870	0.7325	0.4427	0.6217	0.4850	0.7342	0.4418
Children 0-4	0.1494	0.3565	0.1094	0.3122	0.1540	0.3610	0.1012	0.3016	0.1562	0.3631
Children 5-11	0.2200	0.4143	0.2025	0.4019	0.2220	0.4156	0.1962	0.3972	0.2234	0.4165
Children 12-15	0.1613	0.3678	0.1522	0.3593	0.1624	0.3688	0.1482	0.3554	0.1632	0.3696
Household size	3.1707	1.3342	2.9633	1.4376	3.1946	1.3197	2.9681	1.4156	3.1996	1.3198
ALD	0.1033	0.3043								
WLD	0.1246	0.3303								
N	44329		4578		39751		5525		38804	

Table 2: Descriptive Statistics, FRS 1994/95-2002/03 (England)

	All		LSI		Non LSI		LLSI		Non LLSI	
	Mean	Std-Div	Mean	Std-Div	Mean	Std-Div	Mean	Std-Div	Mean	Std-Div
Participation	0.6991	0.4587	0.4855	0.4998	0.7629	0.4253	0.3445	0.4752	0.7613	0.4263
Age	39.21	12.24	44.67	12.32	37.58	11.73	45.64	12.12	38.08	11.90
Male	0.4798	0.4996	0.5219	0.4995	0.4672	0.4989	0.5250	0.4994	0.4719	0.4992
Married	0.8482	0.3588	0.8095	0.3927	0.8598	0.3472	0.7861	0.4100	0.8591	0.3479
Children 0-4	0.1290	0.3352	0.0801	0.2715	0.1435	0.3506	0.0713	0.2574	0.1391	0.3460
Children 5-11	0.1290	0.3352	0.0952	0.2935	0.1391	0.3460	0.0896	0.2856	0.1359	0.3427
Children 12-15	0.1069	0.3090	0.0927	0.2900	0.1112	0.3143	0.0885	0.2840	0.1101	0.3131
Education leaving age	18.94	12.38	17.54	9.78	19.35	13.03	17.17	9.38	19.25	12.81
LSI	0.2301	0.4209							0.0950	0.2932
LLSI	0.1492	0.3563	0.6487	0.4774						
N	233260		53662		179598		34812		198448	

Table 3: Probit results of the predicted change in employment (DALD), BHPS 1991-1998 (England)

	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)	
	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.
Disabled	-0.3641**	0.0134	-0.3617**	0.0135	-0.3252**	0.0151	-0.3765**	0.0206	-0.3737**	0.0207	-0.3410**	0.0231
Post 1996	0.0367**	0.0051	0.0368**	0.0051	0.0411**	0.0053						
Disabled x Post 1996	-0.0349**	0.0164	-0.0359**	0.0162	-0.0193	0.0162						
Disabled x 1991							0.0317	0.0281	0.0310	0.0287	0.0405	0.0269
Disabled x 1992							0.0318	0.0255	0.0298	0.0271	0.0292	0.0275
Disabled x 1993							0.0154	0.0268	0.0159	0.0261	0.0215	0.0266
Disabled x 1994							-0.0172	0.0266	-0.0153	0.0254	-0.0233	0.0257
Disabled x 1995							-0.0064	0.0236	-0.0082	0.0241	-0.0058	0.0224
Disabled x 1996												
Disabled x 1997							-0.0216	0.0237	-0.0228	0.0236	-0.0104	0.0218
Disabled x 1998							-0.0296	0.0231	-0.0305	0.0245	-0.0064	0.0248
Regional dummies	No		Yes		Yes		No		Yes		Yes	
Characteristics	No		No		Yes		No		No		Yes	
Time dummies	No		No		No		Yes		Yes		Yes	
N	46395		46395		44337		46395		46395		44337	
R2	0.0501		0.0535		0.1752		0.0507		0.0541		0.1758	

Note: Robust s.e; bootstrapped s.e for interaction terms, **indicates significance at 5% level, *indicates significance at 10% level. Characteristics refer to age, age sq, marital status, gender, higher degree, degree, A-level, O-level and below, children aged 0-4, 5-11 and 12-15, house ownership, household size. Regional dummies refer to the 10 standard regions in the England. Pooled probit estimation where dependent variable is labour market participation as defined in the text.

Table 4: Probit results of the predicted change in employment (WLD), BHPS 1991-1998 (England)

	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)	
	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.
Disabled	-0.3227**	0.0128	-0.3207**	0.0128	-0.2848**	0.0141	-0.3485**	0.0192	-0.3461**	0.0192	-0.3025**	0.0214
Post 1996	0.0520**	0.0051	0.0518**	0.0051	0.0534**	0.0054						
Disabled x Post 1996	-0.0428**	0.0157	-0.0448**	0.0159	-0.3740**							
Disabled x 1991							0.0407	0.0264	0.0407	0.0256	0.0462	0.0245
Disabled x 1992							0.0296	0.0257	0.0276	0.0256	0.0110	0.0237
Disabled x 1993							0.0015	0.0235	0.0039	0.0246	0.0007	0.0235
Disabled x 1994							-0.0132	0.0222	-0.0113	0.0224	-0.0224	0.0212
Disabled x 1995							-0.0182	0.0214	-0.0183	0.0203	-0.0207	0.0212
Disabled x 1996												
Disabled x 1997							-0.0301	0.0202	-0.0324	0.0191	-0.0278	0.0199
Disabled x 1998							-0.0411*	0.0219	-0.0420**	0.0211	-0.0406*	0.0208
Regional dummies	No		Yes		Yes		No		Yes		Yes	
Characteristics	No		No		Yes		No		No		Yes	
Time dummies	No		No		No		Yes		Yes		Yes	
N	46395		46395		44340		46395		46395		44340	
R2	0.0541		0.0574		0.1773		0.0527		0.0560		0.1768	

Note: Robust s.e; bootstrapped s.e for interaction terms, **indicates significance at 5% level, *indicates significance at 10% level. Characteristics refer to age, age sq, marital status, gender, higher degree, degree, A-level, O-level and below, children aged 0-4, 5-11 and 12-15, house ownership, household size. Regional dummies refer to the 10 standard regions in the England. Pooled probit estimation where dependent variable is labour market participation as defined in the text.

Table 5: Probit results for the change in employment (DALD), BHPS 1991-2002 (England)

	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)	
	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.
Disabled	-0.3606**	0.0135	-0.3572**	0.0135	-0.3163**	0.0150	-0.3731**	0.0208	-0.3693**	0.0209	-0.3316**	0.0231
Post 1996	0.0481**	0.0048	0.0482**	0.0480	0.0482**	0.0050						
Disabled x Post 1996	-0.0242	0.0149	-0.0243	0.0148	-0.0130	0.0145						
Disabled x 1991							0.0317	0.0283	0.0311	0.0286	0.0402	0.0278
Disabled x 1992							0.0318	0.0258	0.0300	0.0269	0.0291	0.0253
Disabled x 1993							0.0154	0.0267	0.0155	0.0284	0.0208	0.0257
Disabled x 1994							-0.0172	0.0243	-0.0153	0.0261	-0.0237	0.0258
Disabled x 1995							-0.0064	0.0236	-0.0083	0.0235	-0.0054	0.0235
Disabled x 1996												
Disabled x 1997							-0.0209	0.0217	-0.0227	0.0232	-0.0108	0.0218
Disabled x 1998							-0.0296	0.0235	-0.0299	0.0231	-0.0073	0.0234
Disabled x 1999							-0.0294	0.0249	-0.0296	0.0254	-0.0093	0.0243
Disabled x 2000							-0.0127	0.0245	-0.0130	0.0253	-0.0010	0.0239
Disabled x 2001							0.0141	0.0252	0.0142	0.0255	0.0204	0.0244
Disabled x 2002							-0.0134	0.0261	-0.0144	0.0266	-0.0120	0.0252
Regional dummies	No		Yes		Yes		No		Yes		Yes	
Characteristics	No		No		Yes		No		No		Yes	
Time dummies	No		No		No		Yes		Yes		Yes	
N	69811		69811		66616		69811		69811		66616	
R2	0.0558		0.0592		0.1781		0.0565		0.0599		0.1787	

Note: Robust s.e; bootstrapped s.e for interaction terms, **indicates significance at 5% level, *indicates significance at 10% level. Characteristics refer to age, age sq, marital status, gender, higher degree, degree, A-level, O-level and below, children aged 0-4, 5-11 and 12-15, house ownership, household size. Regional dummies refer to the 10 standard regions in the England. Pooled probit estimation where dependent variable is labour market participation as defined in the text. Disability is proxied for 1999, see text for details.

Table 6: Probit results for the change in employment (LSI), FRS 1994/95-2002/03 (England)

	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)	
	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.
Disabled	-0.2810**	0.0043	-0.2811**	0.0043	-0.2643**	0.0045	-0.2726**	0.0074	-0.2737**	0.0074	-0.2591**	0.0076
Post 1996	0.0592**	0.0026	0.0598**	0.0026	0.0443**	0.0026						
Disabled x Post 1996	0.0138**	0.0053	0.0138**	0.0049	0.0058	0.0052						
Disabled x 1994							-0.0086	0.0106	-0.0070	0.0107	-0.0007	0.0099
Disabled x 1995							-0.0286**	0.0109	-0.0272**	0.0101	-0.0164	0.0102
Disabled x 1996												
Disabled x 1997							0.0026	0.0105	0.0047	0.0103	-0.0014	0.0098
Disabled x 1998							-0.0005	0.0108	-0.0006	0.0103	-0.0060	0.0096
Disabled x 1999							-0.0160	0.0103	-0.0140	0.0102	-0.0153	0.0098
Disabled x 2000							0.0060	0.0103	0.0050	0.0101	0.0046	0.0101
Disabled x 2001							-0.0104	0.0102	-0.0078	0.0108	-0.0099	0.0097
Disabled x 2002							0.0289**	0.0100	0.0296**	0.0101	0.0266**	0.0101
Regional dummies	No		Yes		Yes		No		Yes		Yes	
Characteristics	No		No		Yes		No		No		Yes	
Time dummies	No		No		No		Yes		Yes		Yes	
N	233698		233698		233260		233698		233698		233260	
R2	0.0526		0.0581		0.1352		0.0531		0.0587		0.1356	

Note: Robust s.e; bootstrapped s.e for interaction terms, **indicates significance at 5% level, *indicates significance at 10% level. Characteristics refer to age, age sq, marital status, gender, full-time education leaving age and its square; children aged 0-4, 5-11 and 12-15. Regional dummies refer to the 10 standard regions in the England. Pooled probit estimation where dependent variable is labour market participation as defined in the text.

Table 7: Probit results for the change in employment (LLSI), FRS 1994/95-2002/03 (England)

	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)		Model (6)	
	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.	dF/dx	Robust s.e.
Disabled	-0.4178**	0.0049	-0.4169**	0.0049	-0.4032**	0.0053	-0.4290**	0.0086	-0.4282**	0.0087	-0.4192**	0.0094
Post 1996	0.0557**	0.0025	0.0561**	0.0025	0.0424**	0.0025						
Disabled x Post 1996	0.0059	0.0060	0.0062	0.0059	0.0002	0.0058						
Disabled x 1994							0.0313**	0.0122	0.0313**	0.0117	0.0366**	0.0113
Disabled x 1995							-0.0004	0.0113	-0.0004	0.0114	0.0078	0.0112
Disabled x 1996												
Disabled x 1997							0.0128	0.0119	0.0147	0.0119	0.0097	0.0114
Disabled x 1998							0.0077	0.0118	0.0081	0.0119	0.0034	0.0114
Disabled x 1999							0.0166	0.0118	0.0185	0.0112	0.0161	0.0115
Disabled x 2000							0.0077	0.0118	0.0076	0.0126	0.0076	0.0119
Disabled x 2001							0.0095	0.0117	0.0107	0.0118	0.0121	0.0115
Disabled x 2002							0.0417**	0.0121	0.0425**	0.0121	0.0407**	0.0115
Regional dummies	No		Yes		Yes		No		Yes		Yes	
Characteristics	No		No		Yes		No		No		Yes	
Time dummies	No		No		No		Yes		Yes		Yes	
N	233703		233703		233265		233703		233703		233265	
R2	0.0806		0.0852		0.1610		0.0810		0.0856		0.1787	

Note: Robust s.e; bootstrapped s.e for interaction terms, **indicates significance at 5% level, *indicates significance at 10% level. Characteristics refer to age, age sq, marital status, gender, full-time education leaving age and its square; children aged 0-4, 5-11 and 12-15. Regional dummies refer to the 10 standard regions in the England. Pooled probit estimation where dependent variable is labour market participation as defined in the text.

Table 8: Disability and Employment Transitions overall (BHPS), percentage

		Time t-1			
		Unemployed Disabled	Unemployed Non-disabled	Employed Disabled	Employed Non-disabled
Time t	Unemployed Disabled	75.89	6.36	9.77	0.52
	Unemployed Non-disabled	16.63	67.42	5.03	5.90
	Employed Disabled	3.60	0.96	43.4	3.19
	Employed Non-disabled	3.88	25.27	41.79	90.39

Note: Based on a pooled sample from the BHPS where consecutive observations were available. Unconditional probabilities.

Table 9: Disability and Employment Transitions prior DDA (BHPS), percentage

		Time t-1			
		Unemployed Disabled	Unemployed Non-disabled	Employed Disabled	Employed Non-disabled
Time t	Unemployed Disabled	72.44	6.80	10.42	0.60
	Unemployed Non-disabled	20.19	68.5	5.99	6.60
	Employed Disabled	3,00	0.77	39.53	3.08
	Employed Non-disabled	4.37	23.92	44.07	89.72

Note: Based on a pooled sample from the BHPS where consecutive observations were available. Unconditional probabilities.

Table 10: Disability and Employment Transitions post DDA (BHPS), percentage

		Time t-1			
		Unemployed Disabled	Unemployed Non-disabled	Employed Disabled	Employed Non-disabled
Time t	Unemployed Disabled	78.92	5.93	9.27	0.42
	Unemployed Non-disabled	13.68	66.82	4.36	5.25
	Employed Disabled	3.81	1.07	47.66	3.18
	Employed Non-disabled	3.59	26.18	38.71	91.15

Note: Based on a pooled sample from the BHPS where consecutive observations were available. Unconditional probabilities.