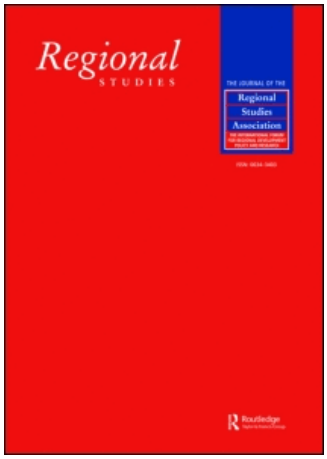

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Why do disability benefit rolls vary between regions? A review of the evidence from the USA and the UK

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Why Do Disability Benefit Rolls Vary between Regions? A Review of the Evidence from the USA and the UK

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MCVICAR D. (2006) Why do disability benefit rolls vary between regions? A review of the evidence from the USA and the UK, *Regional Studies* **40**, 519–533. Over the last 30 years, many Organization for Economic Co-operation and Development (OECD) countries have seen a dramatic rise in the share of the working-age population receiving earnings replacement sickness and disability benefits. The reasons behind this growth – particularly for the USA, but also to a lesser extent elsewhere – have been extensively researched in the economics literature. What have been less well researched are the large spatial differences in the size of disability benefit rolls that have emerged in some countries over this period. The UK displays a distinct regional pattern where working-age men and women in the 'North' are considerably more likely to be claiming disability benefits than those in the 'South'. The USA has its own version of the north/south divide, with many southern states displaying disproportionately large disability benefit rolls. The paper describes these regional patterns and explores the existing economics literature on disability benefits in search of potential explanations for them.

Health Disability Disability benefits Incapacity Benefit Labour markets

MCVICAR D. (2006) Pourquoi les listes des demandeurs de prestations d'invalidité varient suivant la région?: une critique des preuves provenant des E-U et du R-U, *Regional Studies* **40**, 519–533. Sur les 30 dernières années, beaucoup des pays-membres de l'OCDE ont témoigné d'une montée vertigineuse de la part de la population active qui font une demande de prestations de l'assurance maladie et d'invalidité invalidité. La documentation économique a approfondi les raisons qui expliquent cette montée – notamment pour les E-U mais aussi dans une moindre mesure ailleurs. Ce qui a été moins bien recherché c'est la variation géographique importante des listes des demandeurs de prestations d'invalidité qui se font le jour dans certains pays sur cette période. Le R-U montre une distribution régionale nette à partir de laquelle il est plus probable que les populations masculine et féminine en âge de travailler du 'nord' font une demande des prestations invalidité que ne le font celles du 'sud'. Les E-U ont leur propre version du clivage nord–sud; à savoir beaucoup des états du sud ont des listes des demandeurs de prestations d'invalidité disproportionnées. Cet article cherche à présenter ces distributions régionales et à examiner la documentation économique existante sur prestations d'invalidité afin de rechercher des explications éventuelles.

Santé Invalidité Prestations d'invalidité Prestations d'incapacité Marchés du travail

MCVICAR D. (2006) Warum sind Invalidenrenten von Region zu Region verschieden? Eine Besprechung von Beweisen aus den USA und dem UK, *Regional Studies* **40**, 519–533. Im Laufe der letzten 30 Jahre haben viele OECD Länder einen dramatischen Anstieg des Anteils der Bevölkerung im erwerbsfähigen Alter gesehen, die statt Verdienst Krankengeld und Invalidenrenten empfangen.Die Gründe für diesen Anstieg – besonders in den USA, aber auch, obschon in geringerem Maße, andernorts – sind in der Wirtschaftsliteratur ausgiebig untersucht worden. Was jedoch weniger gründlich untersucht wurde, sind die beträchtlichen räumlichen Unterschiede im Umfang der Invalidenrentenlisten, die sich in manchen Ländern in diesem Zeitraum ergeben haben. Das UK weist ein ausgesprochen regionales Muster auf, in dem die Namen sowohl von Männern wie von Frauen im erwerbsfähigen Alter im 'Norden'weitaus öfter auf der Liste der Invalidenrente in Anspruch Nehmenden erscheinen als im Süden. Die USA

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haben ihre eigene Version der Nord–Süd 'Wasserscheide', in der viele Südstaaten unverhältnismäßig lange Invalidenrentnerlisten aufweisen. Dieser Aufsatz beschreibt diese Regionalmuster, und untersucht die bereits vorliegende Wirtschaftsliteratur zur Invalidenrentnerfrage auf der Suche nach einer möglichen Erklärung dafür.

Gesundheit Invalidenrenten Behindertenrenten Arbeitswelt

McVicar D. (2006) ¿Por qué las listas de prestaciones por discapacidad varían según las regiones? Una revisión de ejemplos de Estados Unidos y el Reino Unido, *Regional Studies* **40**, 519–533. En los últimos 30 años muchos países de la OCDE han notado un espectacular aumento de la población en edad de trabajar que recibe prestaciones por enfermedad o discapacidad. El motivo de este crecimiento, especialmente en los EE. UU. pero también en menor medida en otros países, se ha estudiado exhaustivamente en la literatura sobre economía. No obstante, se han investigado poco las grandes diferencias espaciales en cuanto al número de personas que reciben prestaciones por discapacidad que han surgido en algunos países durante este periodo. En el Reino Unido se observa un modelo regional característico en las regiones del norte donde mujeres y hombres en edad de trabajar presentan una mayor tendencia a solicitar prestaciones que los del sur. En Estados Unidos hay una versión propia de la división norte–sur porque en el sur hay desproporcionadamente más personas que reciben prestaciones por discapacidad. Aquí describimos estos modelos regionales y analizamos la literatura actual sobre economía con referencia a las prestaciones por discapacidad para hallar posibles explicaciones a este fenómeno.

Salud Discapacidad Prestaciones por discapacidad Prestación por incapacidad Mercados de trabajo

JEL classifications: J68, I12

INTRODUCTION

The dramatic rise over the last 30 years in the number of people of working age claiming sickness and disability benefits in the UK (Fig. 1), USA (Fig. 2) and many other countries has recently been well documented (for the UK, see, for example, Berthoud, 1998; Beatty *et al.*, 2000; Huddleston, 2000; Walker and Howard, 2000; Alcock *et al.*, 2003; Faggio and Nickell, 2003; and Bell and Smith, 2004; for the USA, see, for example, Bound and Burkhauser, 1999; and Autor and Duggan, 2003; for other countries, see, for example, Bowitz, 1997; Bound and Burkhauser, 1999; and Prinz, 2003). In the UK, the numbers of working-age people claiming earnings replacement sickness and disability benefits have grown from under 1 million in the mid-1970s to 2.7 million in 2003 (Beatty and Fothergill, 2004).[1] Following major reforms in 1995, the number of working-age claimants in the UK has continued to rise, despite a slight fall in headline (overall) disability benefit rolls over 1995–2000.[2] In the USA, the numbers of working-age people claiming earnings replacement sickness and disability benefits have grown from 4.1 million in 1975 to 9.4 million in 2002. The US literature points to labour market conditions and benefit characteristics as the key drivers of growth in aggregate disability benefit rolls (e.g. Bound and Burkhauser, 1999; Autor and Duggan, 2003). Similar factors together with the characteristics of alternative benefits, health and health perceptions have been suggested as driving the aggregate growth of UK disability benefit rolls (for a recent review, see McVicar, 2005).

There has also been recent interest in the dramatic spatial differences in disability benefit claimant rates, both across countries (Fig. 3) (e.g. Bound and Burkhauser, 1999; Marin and Prinz, 2003) and within countries: for the USA, see Fig. 4 (e.g. McCoy *et al.*, 1994; Nelson, 1994; Rupp and Stapleton, 1998); for the UK, see Fig. 5 (e.g. Beatty *et al.*, 2000; Anyadike-Danes, 2004).

In terms of cross-country differences in disability benefit rolls, Bound and Burkhauser (1999) compare the USA with Sweden, Germany and the Netherlands. They find 1995 working-age recipiency rates to be over twice as high in the Netherlands and almost twice as high in Sweden as in the USA, with marginally lower recipiency rates in Germany. Fig. 3 shows 1999 working-age recipiency rates for a wider range of Organization for Economic Co-operation and Development (OECD) countries. They range from $\geq$9% in the Netherlands and Norway to just over 4% in Germany and just under 4% in Canada. The UK sits close to the upper end of this country distribution, with a 1999 recipiency rate of 6.7%. The USA has a 1999 recipiency rate of 4.7%. For more details on cross-country patterns in disability benefit rolls, see Marin and Prinz (2003). Blondal and Scarpetta (1998) note that such large cross-country differences, albeit in slightly broader terms of inactivity on health grounds, were not apparent as recently as 1971.

The present author's primary interest, however, is in *within* country differences in disability benefit rolls, and specifically spatial patterns in the USA and UK. Within the USA, the proportion of the working-age population at state level in receipt of disability benefits ranges from a high of 7% in West Virginia to a low of 2% in Utah and Alaska (Fig. 4). Within the UK, the number of earnings replacement disability benefit claimants as a proportion of the regional working-age population ranges from a high of 11% in Wales to a low of 4% in the South East of England (Fig. 5).[3] Indeed, at the

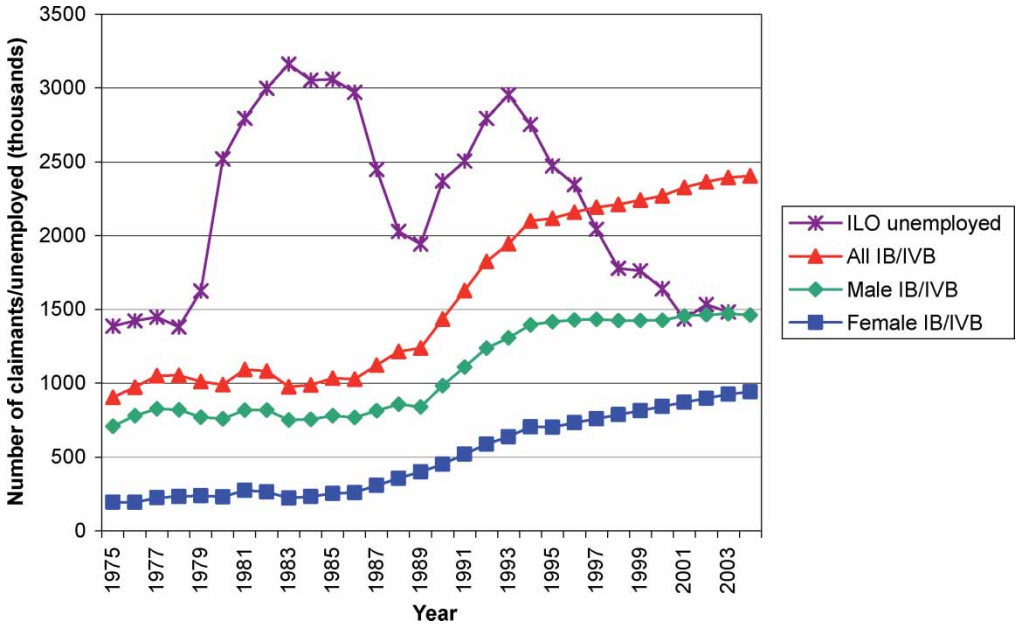

Fig. 1. *Working age sickness and disability benefit claimants and International Labour Organization (ILO) unemployed in the UK, 1975–2004*

Notes: 'Working age' is taken as 18–64 years for men and 18–59 years for women. Figures refer to claimants of Sickness, Invalidity (pre-1995) and Incapacity (post-1995) Benefit at the end of the statistical year. *Source:* Social Security Statistics (recently Department for Work and Pensions) (various years)

regional level, there is a clear North/South divide with the 'North' of the UK (broadly interpreted to include Wales) showing considerably higher disability benefit claimant rates than the 'South'. The USA has its own (somewhat looser) version of the North/South divide, with disproportionately high disability benefit rolls in many southern states. Other countries also show within-country variation in disability benefit rolls, e.g. with recipiency rates over twice as high in the South of Italy than in the North (Baldacci and De Santis, 2003). At a finer level of spatial disaggregation, differences can be even more pronounced (e.g. McCoy *et al.*, 1994; Beatty *et al.*, 2000; Alcock *et al.*, 2003).

The explanations for such spatial patterns have arguably been less extensively explored, however, than the factors driving aggregate growth. The primary (although not exclusive) focus of this paper – where there are a variety of competing or complimentary potential explanations for observed patterns – is on those quantitative studies that examine the spatial distribution of disability benefit rolls using a multiple regression framework. Bound and Burkhauser

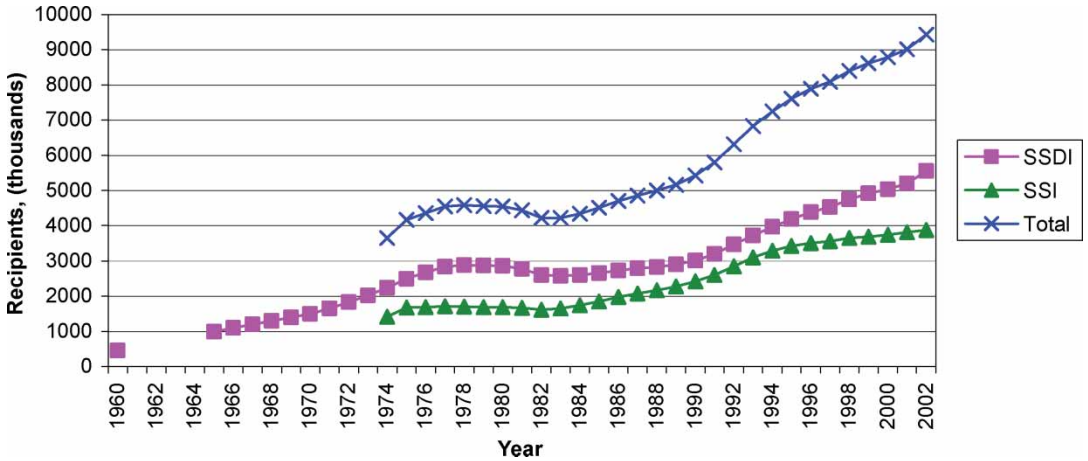

Fig. 2. *US working age disability benefit rolls (Social Security Disability Insurance (SSDI) and Supplementary Security Income (SSI) recipients), 1960–2002*

Notes: Figures are for adults under the age of 65 years. Because some recipients are entitled to both SSDI and SSI, the 'total' series will slightly overstate the total number of recipients. *Sources:* Bound and Burkhauser (1999), Social Security Administration (2002)

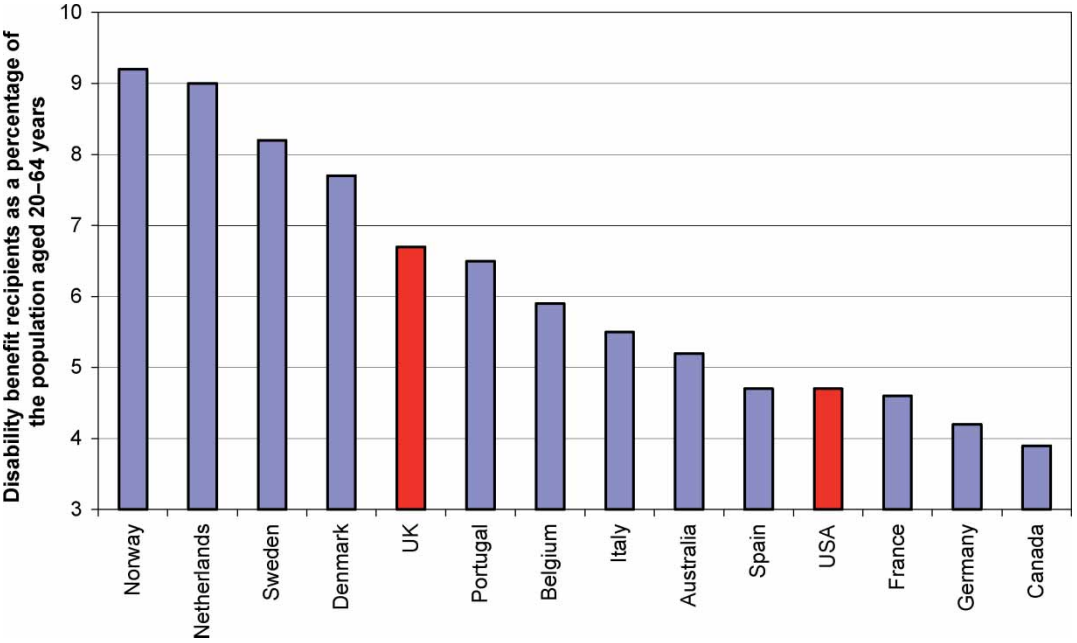

Fig. 3. *Disability benefit recipiency rates across countries as a percentage of the population aged 20–64 years, 1999*
Source: MARIN and PRINZ (2003)

(1999) suggest that a lack of suitable data has so far constrained detailed quantitative cross-country studies. This lack of data is less of a problem within countries, and a small number of studies have estimated state-level disability benefit rolls in the USA (for a review, see BOUND and BURKHAUSER, 1999; more recently, see AUTOR and DUGGAN, 2003; or BLACK *et al.*, 2002, for a county-level study within four states). Labour market factors are again (unsurprisingly) found to be significant in this spatial context. The generosity of disability benefits – which varies between high- and low-wage states – is also found to play a role. The second section explores this US literature in more depth.

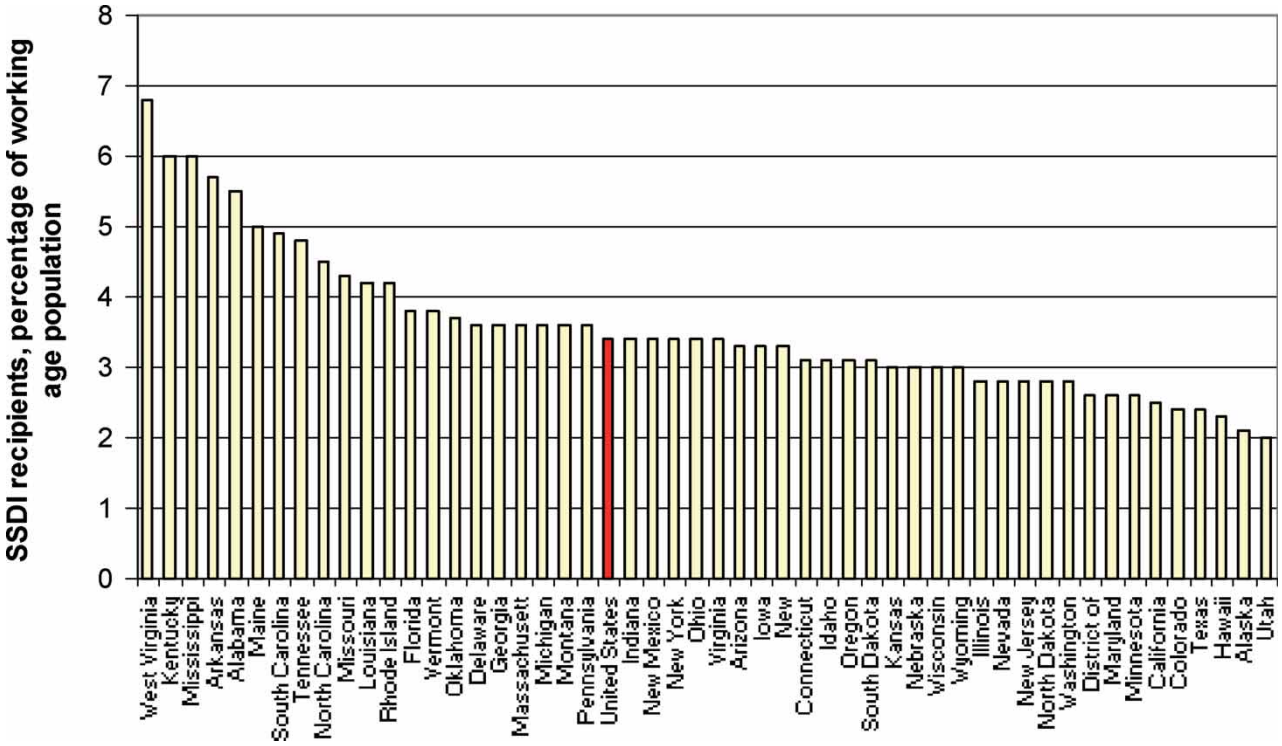

Fig. 4. *US Social Security Disability Insurance (SSDI) recipients as a percentage of the working age population by state, February 2004*
Source: SOCIAL SECURITY ADMINISTRATION (2002)

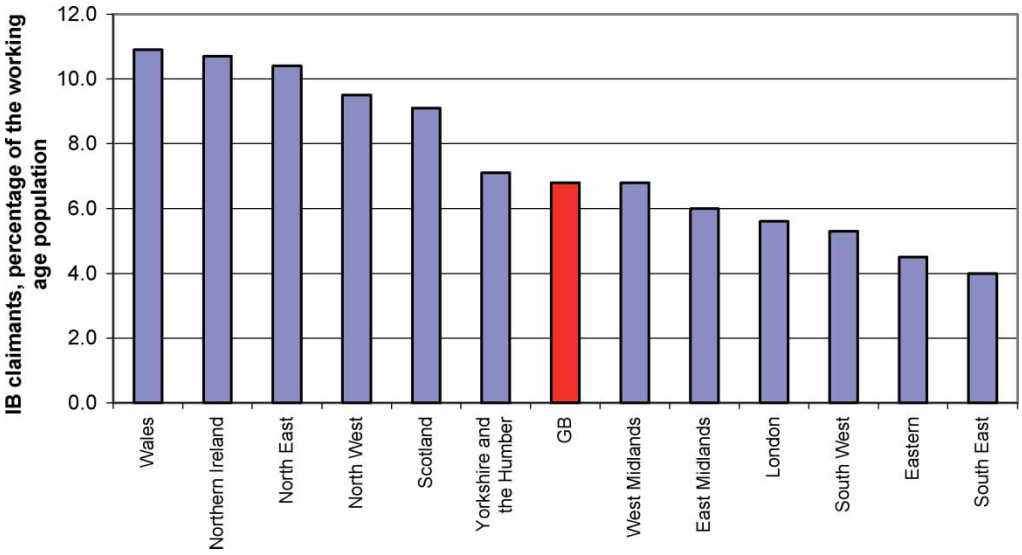

Fig. 5. *UK Incapacity Benefit claimants as a percentage of the working age population for Government Office Regions, February 2004*

Sources: Department for Work and Pensions, Incapacity Benefit and Severe Disablement Allowance Quarterly Summary Statistics, February 2004; Department of Social Development Northern Ireland, Incapacity Benefit and Severe Disablement Allowance Summary Statistics

One should not just assume, however, that those factors thought to explain spatial differences in disability benefit rolls in the USA are equally important, or work in the same way, in the UK. For one thing, regional differences in disability benefit claimant rates in the UK appear to follow a more pronounced North/South pattern than state differences in the USA. There are also important contextual differences, e.g. in terms of the way in which falling demand for the low skilled has been manifested, in terms of the nature of the benefit system, and broader institutional structures. Fortunately, there have been a number of cross-sectional studies looking at disability benefit claims in the UK using micro-data from the 1980s (e.g. MOLHO, 1989, 1991; DISNEY and WEBB, 1991). Disney and Webb also estimate a regional-level, pooled, cross-section time-series model for three data points in the 1980s. Broadly in keeping with the US literature, local labour market and demographic factors generally were found to play a role in these studies, together with less well-explained regional dummies.

With a few possible exceptions, however (e.g. BEATTY and FOTHERGILL, 1999; NOLAN and FITZROY, 2003; FAGGIO and NICKELL, 2005; O'LEARY *et al.*, 2005) – and even these studies focus on slightly different questions to those which are of interest herein – there has been little in the way of quantitative analysis of the spatial pattern of UK disability benefit rolls since the early 1990s. Since that time, there has been further growth of national disability benefit rolls and, in recent years, some convergence of (headline) regional claimant rates (Fig. 6).[4] There has also been a sustained aggregate fall together with regional convergence in unemployment rates, at least unemployment as measured by claimant count or International Labour Organization (ILO) rates. Further, there have been major reforms to disability benefits themselves, e.g. in terms of both their real value and medical screening. There have also been reforms to other potentially alternative benefits, particularly unemployment benefit, e.g. in terms of reduced duration and increased monitoring of job search. In the light of these recent developments, the third section assesses where one currently stands in terms of explaining the regional pattern of disability benefit rolls in the UK.

The policy significance of rising and spatially concentrated disability benefit rolls is clear. For example, those claiming such benefits are generally not active in the labour market and, therefore, might be thought of as a wasted potential labour resource. To the extent that disability benefit claimants do not search for jobs, there is reduced capacity in the labour market. Large numbers of disability benefit recipients cost governments a lot of money. Further, those inactive and claiming disability benefits are more likely to be at risk from social exclusion. Spatially, whole communities may be at risk from social exclusion where disability benefit recipiency rates are particularly high. Indeed, a raft of recent UK policy initiatives, e.g. the introduction of Incapacity Benefit (IB), The New Deal for the Disabled, the Working Tax Credit (previously the Disabled Person's Tax Credit), Pathways to Work, and Working Neighbourhoods have been aimed at encouraging and helping those disability benefit claimants who may be capable of work back into the labour market. The fourth section summarizes and concludes with a brief discussion of policy implications and suggestions for further research.

Before moving on, it should be made clear that the present paper – although dealing with a subject that

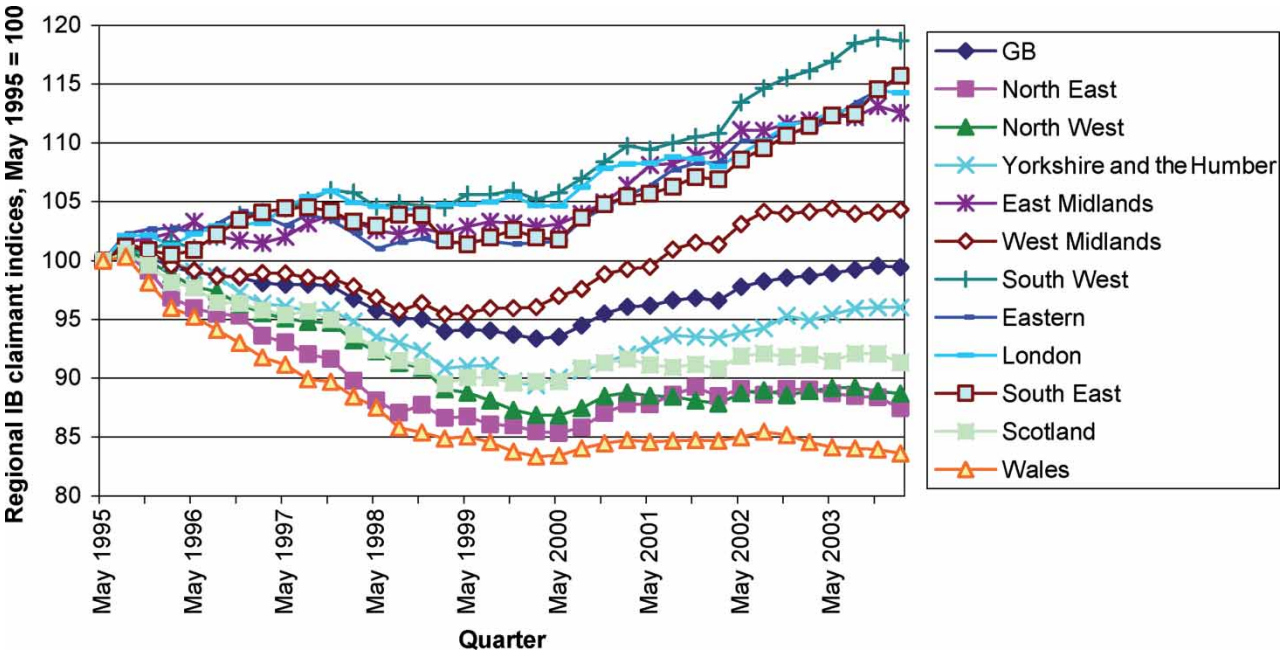

Fig. 6. UK Incapacity Benefit claimants by Government Office Region, May 1995–February 2004; May 1995 = 100
Note: Figures are for all Incapacity Benefit claimants (not limited to working age). *Source:* Department for Work and Pensions, Incapacity Benefit and Severe Disablement Allowance Quarterly Summary Statistics February 2004

crosses many disciplinary boundaries – abstracts from some of the more sociological, psychological and medical aspects to concentrate on the *economics* of spatial patterns in disability benefit rolls.

EXPLAINING SPATIAL PATTERNS IN DISABILITY BENEFIT ROLLS IN THE USA

There are two main federal earnings replacement disability benefits in the USA. Social Security Disability Insurance (SSDI) is payroll tax funded and non-means tested, providing benefits partly related to average monthly labour earnings. Eligibility requires a sufficient work history and evidence of long-term work incapacity. This evidence requires the claimant to have been out of work for a minimum of 5 months and to have an impairment that is expected to last at least 1 year and that is included in a proscribed list as disabling. Supplementary Security Income (SSI) is a means-tested benefit for disabled individuals with insufficient work histories to qualify for SSDI and for those SSDI recipients with low enough incomes. Many SSDI applicants receive SSI during the 5-month waiting period before they are eligible for SSDI (for more details, see BOUND and BURKHAUSER, 1999).

As suggested by Fig. 4, there is a tendency for many southern states to display higher recipiency rates than others, particularly states in the Atlanta region. In February 2004, for example, the proportion of the working-age population in receipt of SSDI ranged from 2.0% in Utah and 2.1% in Alaska to 6.0% in Kentucky and Mississippi, and 6.8% in West Virginia. Looking back, it is generally the same groups of states in the late 1980s/early 1990s showing the highest (the Atlanta region) and lowest SSDI recipiency rates (NELSON, 1994). In 1992, for example, recipiency rates ranged from 0.94% in Alaska to 3.77% in Arkansas. Since then, there has been absolute but not relative divergence in regional recipiency rates. MCCOY *et al.* (1994) examine disability benefit recipiency rates at county level for the USA and highlights additional disability benefit 'hotspots'.

BOUND and BURKHAUSER (1999) provide a thorough review of the US literature on disability benefits but with little detail on spatial differences within the USA. NELSON (1994) and MCCOY *et al.* (1994) discuss such differences but adopt primarily descriptive approaches. RUPP and STAPLETON (1998) review various studies using individual state data or state-level cross-sections or panels. More recently, BLACK *et al.* (2002) and AUTOR and DUGGAN (2003) estimate county and state-level panel models of disability benefit rolls. This brief review will draw primarily on these sources.

The most obvious explanation for the aggregate growth in US disability benefit rolls is that it reflects growth in the number of people with disabilities. This is roundly rejected by the US literature (e.g. BOUND and BURKHAUSER, 1999; AUTOR and DUGGAN, 2003), at least in terms of the health of the working-age population.[5] The proportion of the national working-age population reporting a limiting illness or disability has remained fairly stable, or

grown only slowly, over the last 30 years at around 10% (BOUND and BURKHAUSER, 1999). Most clinical measures (what are sometimes referred to as objective measures of health) have shown a general improvement (e.g. CURRIE and MADRIAN, 1999; AUTOR and DUGGAN, 2003). An exception to this is the rapidly rising trend in reported mental health impairments (CURRIE and MADRIAN, 1999).[6] Bound and Burkhauser suggest that rather than increasing the prevalence of disability, the trend growth in male disability benefit rolls is more related to falling employment rates for working-age men with disabilities, e.g. from 80% in the USA in 1970 to 60% in 1992, with most of those not in employment claiming disability benefits.

Bound and Burkhauser also argue that differences in the ratio of disability transfer recipients to the working-age population across countries cannot be explained by underlying health differences. Spatial health differences are less easily rejected as a potential explanation for spatial patterns in disability benefit rolls *within* the USA, however. Clinical health measures vary across states, with, for example, 2001 age-adjusted mortality rates 20% higher than the US average in Mississippi and 25% lower than the US average in Hawaii (NATIONAL CENTRE FOR HEALTH STATISTICS, 2001). Self-reported disability measures vary to an even greater degree. For example, in 2000, 14.4% of the 16–64-year population reported a work-limiting disability in Mississippi compared with only 8.3% in Alaska.[7] One factor that might contribute to the greater variation in self-reported health data is what has been labelled justification bias, where some of those not participating in the labour market may have an incentive to justify their non-participation by reporting disabilities to be more limiting than might have been the case had they been in employment (e.g. HAVEMAN *et al.*, 1991; BOUND and BURKHAUSER, 1999). In other words, there may be a moral hazard problem with self-reported health data influenced by economic incentives (e.g. PARSONS, 1982; GRUBER and KUBIK, 1997). This is one example of two more general points: that disability is difficult to measure and that it may be endogenous in labour force participation decisions (CURRIE and MADRIAN, 1999).

There are several reasons why one might expect the prevalence of mental or physical impairments to vary across space, or more specifically across states, even if one imagines one starts from a uniform plane in terms of health at birth. For example, MCCOY *et al.* (1994) suggest that the uneven spatial distribution of hazardous or physically demanding occupations – characteristic, for example, of the Atlanta region – contributes to an uneven spatial distribution of disability benefit claimants because of the higher incidence of in-work injury. McCoy *et al.* also suggest that an uneven spatial distribution of poverty – again with high levels in the Atlanta region – may lead to an uneven spatial pattern of disability benefit claims because of the correlation between poverty and ill-health (for further discussion, see, for example, SMITH, 1998; or CURRIE and MADRIAN, 1999). There is also evidence that unemployment can lead to a deterioration in health (e.g. SMITH, 1998; BOUND and BURKHAUSER, 1999) so local labour market factors may affect disability benefit rolls through health in addition to any more direct causal path. Finally, the incidence of health impairments rises monotonically with age, so states with older populations might be expected to display higher levels of disability.

Cross-sectional micro-studies unsurprisingly find a link between labour force participation or disability benefit receipt and health status, whether self-reported or based on clinical measures (e.g. PARSONS, 1982; KREIDER and RIPHAHN, 2000). It follows that one would expect lower labour force participation (and higher disability benefit recipiency) in those states with a higher prevalence of disability. There has been little in the way of direct investigation of this relationship, however, and what evidence there is, e.g. across states using state-level indicators, is not particularly strong. STAPLETON *et al.* (1998), for example, find evidence of a (small but) significant link between disability benefit rolls and incidence of Acquired Immunodeficiency Syndrome (AIDS)/Human Immunodeficiency Virus (HIV) in a state-level pooled cross-section time-series model using 1988–92 data. They do not have data on other conditions, however. In their later state-level pooled time-series cross-section study, AUTOR and DUGGAN (2003) find that states with high initial mortality rates have higher growth in SSDI rolls, although the change in mortality rates is not significant. Given the apparently divergent paths of mortality and disability statistics, however (put simply, people are living longer with disabling health impairments), the suitability of mortality rates as a proxy for disability prevalence is questionable (for a discussion of long-term US trends in chronic conditions, disability and mortality, see WILSON *et al.*, 2005).

There is widespread agreement that local labour market conditions affect disability benefit rolls in the USA in other ways than indirectly through health (e.g. RUPP and STAPLETON, 1995; BOUND and BURKHAUSER, 1999; BLACK *et al.*, 2002; AUTOR and DUGGAN, 2003). This literature tends to conceptualize this causal link in terms of the supply and demand for disability benefits themselves. According to this framework, the state of the labour market (in as much as this determines the alternatives to disability benefit) affects the *demand* for disability benefits while the supply depends on factors such as eligibility criteria and screening intensity. This causal relationship acting through the demand for benefits can be used to explain both the growth over time and spatial distribution of disability benefit recipients.

Much of the US empirical analysis of the growth of disability benefit rolls over time has used state-level panel data on applications and awards, and is reviewed in RUPP and STAPLETON (1998) and BOUND and BURKHAUSER (1999). Rupp and Stapleton also discuss a number of single-state case studies. Although these studies may not focus specifically on spatial patterns, they can inform one about possible factors behind such patterns. State disability benefit rolls are generally counter-cyclical once other factors (e.g. the supply of disability benefits) are controlled for (RUPP and STAPLETON, 1995; BOUND and BURKHAUSER, 1999; also BLACK *et al.*, 2002; AUTOR and DUGGAN, 2003). Autor and Duggan, for example, find that a state-level measure of labour demand for 1979–98 – constructed from national industry employment changes projected onto state industry composition – performs well as a predictor of state-level SSDI applications. At a finer spatial aggregation, Black *et al.* examine the effects of labour demand changes in high and low coal reserve counties in Kentucky, Ohio, Pennsylvania and West Virginia – resulting from the coal boom in the 1970s and coal bust in the 1980s – finding disability benefit rolls to be negatively related to local labour demand.[8] One difficulty with these studies, however, is the degree to which they control, or do not control, for disability prevalence or health more generally. Autor and Duggan, as pointed out above, use mortality rates as their health control. Rupp and Stapleton do not control for health beyond an AIDS/HIV dummy and age distribution. Black *et al.* do not explicitly control for health at all. Given the correlation between health and labour market conditions, this suggests the conclusion that spatial differences in disability benefit rolls are driven by labour market differences independent of health remains not conclusively proven in these studies.

Concerns about health and disability controls aside, what lies behind the suggested relationship between the state of local labour markets and disability benefit rolls? Two avenues are generally discussed in this respect. The first is linked to job destruction, e.g. because of weak labour demand or structural change. Job destruction throws a number of the employed sick and disabled (what BEATTY *et al.*, 2000, call the 'hidden sick') into the jobless pool. Indeed, it may be the sick and disabled who are among the first to lose their jobs in recession (BOUND and BURKHAUSER, 1999). Some of these will move from employment directly onto disability benefits, or at least directly given the 5-month qualification period out of work in the case of SSDI. Others may be successful in finding new jobs. Others still may engage unsuccessfully in job search and apply for disability benefits at a later stage. Therefore, patterns of job destruction in local or regional labour markets are likely to influence local or regional disability benefit rolls. BLACK *et al.* (2002) argue that the relationship between disability rolls and economic conditions will be stronger for permanent shocks than for transitory shocks, i.e. stronger for permanent job destruction than for temporary job destruction. This may be the case because the costs involved in applying for such benefits do not make it worthwhile in the short run (BLACK *et al.*, 2002), or because permanent job destruction leads to loss of job-specific human capital (BOUND and BURKHAUSER, 1999).

A second avenue for labour market conditions to affect disability benefit rolls is through replacement rates (the ratio of benefits payments to individual or average earnings, i.e. the proportion of earnings that are replaced by benefits). Rapidly declining demand for low-skilled workers in the USA over the last 25–30 years has been reflected partly in job destruction, but also in falling real wages at the lower end of the earnings distribution (BLACK *et al.*, 2002). Given that SSDI payments are linked to *average* earnings, this has led to rising replacement rates for low-skilled workers with disabilities. BOUND and BURKHAUSER (1999), KREIDER and RIPHAHN (2000), BLACK *et al.* (2002) and AUTOR and DUGGAN (2003) argue that this trend has increased incentives for the low-skilled disabled to apply for such benefits. The replacement rate story can be applied equally to explain spatial patterns in disability benefit rolls because the replacement value of disability benefits based on national average earnings will be higher in low-wage states and lower in high-wage states (e.g. AUTOR and DUGGAN, 2003). Indeed, various studies (e.g. BLACK *et al.*, 2002; AUTOR and DUGGAN, 2003) rely on this fact in order to identify the effect of replacement rates on the growth in disability benefit rolls over time. Black *et al.*'s estimates, for example, suggest an elasticity of local aggregate SSDI payments with respect to local area earnings of between −0.3 and −0.4. Other studies question the strength of this relationship (e.g. HAVEMAN and WOLFE, 1984; HAVEMAN *et al.*, 1991). BOUND and BURKHAUSER (1999) question whether Black *et al.*'s estimates (published in an earlier version of the paper) really identify relative financial attractiveness of SSDI versus work, or whether they pick up a more general economic conditions effect.

Increased demand for disability benefits resulting from declining labour market opportunities, particularly for the low skilled, has at times coincided with the increased *supply* of benefits resulting, for example, from looser eligibility criteria (BOUND and BURKHAUSER, 1999). The suggestion is that when such factors combine, disability benefit rolls are likely to increase rapidly. Various studies argue that the tightness of eligibility criteria for SSDI or SSI, e.g. in terms of medical screening stringency, has been a key factor in explaining the time path of disability benefit rolls (e.g. RUPP and STAPLETON, 1995; GRUBER and KUBIK, 1997; BOUND and BURKHAUSER, 1999; KREIDER and RIPHAHN, 2000; AUTOR and DUGGAN, 2003). Rupp and Stapleton, for example, argue that US disability benefit rolls did *not* rise in the early 1980s – a period

where one would expect growing demand for such benefits – because more stringent screening in the early 1980s in the USA counteracted the effect of the recession. Bound and Burkhauser suggest that, in contrast, disability benefit rolls grew rapidly in the recession of the early 1990s because eligibility criteria had been relaxed in the mid-1980s.[9]

Although as federal programmes SSDI and SSI eligibility criteria are determined nationally, the benefits themselves are administered at the state level. The toughness with which individual states screen applicants is, therefore, one potential factor in differences in disability rolls between states. PARSONS (1991) and GRUBER and KUBIK (1997) present evidence suggesting that variation in state board interpretations of federal eligibility rules has led to different rates of growth in state disability benefit rolls. For example, Gruber and Kubik suggest that in the late 1970s the most liberal states were almost twice as likely to grant benefits to new applicants as the most stringent states. RUPP and STAPLETON (1995) and BOUND *et al.* (1998) also discuss evidence that cutbacks in state general assistance – which might be regarded as alternative benefits for some – influenced state-level disability benefit rolls. Further, STAPLETON *et al.* (1998) suggest some states may have been more generous with applicants to SSDI and SSI in a deliberate effort to shift people from state- to federally funded benefits. At a cross-country level, BOUND and BURKHAUSER (1999) argue that the relative generosity and stringency of eligibility criteria for disability benefits in different countries may be the key factor influencing relative disability benefit rolls.

EXPLAINING SPATIAL PATTERNS IN DISABILITY BENEFIT ROLLS IN THE UK

Depending on the particular classification adopted, there are basically five main disability benefits in the UK (for an overview, see BERTHOUD, 1998). IB is the contributory earnings replacement benefit – eligibility requires a work history – for those unable to work because of disability (assessed by government doctors by means of an All Work Test or Personal Capability Assessment). IB is the closest thing to a UK equivalent of SSDI in the USA. The equivalent earnings replacement benefit before 1995 was called Invalidity Benefit (IVB). IB is currently paid at one of three flat rates depending on the period the individual has been unable to work, with two caveats. First, earnings-related top-ups are still available for claimants whose claims began before the 1995 reforms (IVB included a limited prior earnings-related element). Second, there is limited means testing for new claims since 1995 with significant pension income. Eligibility criteria and benefit rates for IB are set nationally for the whole UK, although they are administered at the local level.

There are two forms of disability benefit for those unable to work because of disability that do not meet contributions based eligibility criteria, e.g. because their disabilities have prevented them from building up sufficient work histories. The first – for which new claimants are no longer eligible since 2001 – is Severe Disablement Allowance (SDA). There is no US equivalent to SDA. Those ineligible for IB or SDA may be eligible to have their National Insurance (NI) credits paid (contributions towards the state pension). Credits-only claimants usually also receive means tested minimum income benefits known as Income Support (IS), often with a 'disability premium'. This is the closest thing to a UK equivalent to SSI in the USA. A fourth type of disability benefit is an *additional costs* benefit known as Disability Living Allowance. Finally, those with disabilities who are in low-paid work may be eligible for Working Tax Credit (previously the Disabled Person's Tax Credit).

HUDDLESTON (2000) presents data on the aggregate number of claimants of the various benefits over time. Here the focus is on spatial patterns in IB and IVB rolls, i.e. contributory earnings replacement disability benefits, which – despite recent growth in the total number of credits-only claimants and those claiming IS with a disability premium – still account for the majority of disability benefit claimants and expenditures in the UK.

As shown in Fig. 5, there is a clear North/South divide in UK disability benefit rolls, with the 'North' (broadly interpreted to include Wales) showing considerably higher disability benefit claimant rates than the 'South' (also ANYADIKE-DANES, 2004). This section examines possible explanations for this pattern, both in the light of the US literature discussed in the second section and drawing on specific UK quantitative studies of spatial disability benefit roll patterns (mostly published in the late 1980s and early 1990s).

First, consider the potential role played by spatial differences in the incidence of physical and mental impairments. There is evidence of spatial differences in the self-reported incidence of disability within the UK (e.g. WALKER and HOWARD, 2000). For example, the share of the working-age population reporting a disability ranges from 26.6% in Knowsley (in the North West of England) to 9.5% in Richmond-upon-Thames (outer London) (details are from the Annual Local Area Labour Force Survey). More generally and at a higher level of aggregation, 19% of adults in Wales describe their health as 'not good' (rather than 'good' or 'fairly good') compared with just 13% in England.[10] At first glance, figures such as these appear to correspond broadly with the North/South divide in disability benefit rolls. As discussed above, however, various authors warn that self-reported health data, particularly for men, though correlated with 'objective' measures of health, may suffer from justification and other biases. So are regional differences in self-reported disability incidence explained by disability benefit rolls rather than vice versa? Spatial differences in

clinical measures of health suggest at least some causality from local or regional health measures to disability benefit claimant rates. For example, 1997 standardized mortality rates in Scotland were 115 compared with 90 for the South West of England (UK = 100), with an even greater degree of variation within regions. But as discussed in the second section, such figures have their own weaknesses as proxies for the prevalence of disability.

As for the USA, spatial patterns in health are likely to be partly driven by spatial differences in demographic and socio-economic factors, e.g. the spatial age distribution of the population and the incidence of poverty, and partly by spatial differences in labour markets. In terms of indirect labour market effects, BEATTY *et al.* (2000) argue that given evidence that unemployment can lead to a deterioration in health, and since unemployment in the 'North' has been persistently higher than in the 'South', this is one route through which the observed UK regional pattern in disability benefit rolls could have emerged. Second, as for the USA, there is (and has been) an uneven spatial distribution of mining and heavy industry in the UK. Therefore, given higher levels of occupational ill-health in such industries, regional industry mix is likely to be a factor in UK regional health differences. This is a key part of Beatty *et al.*'s explanation of the regional pattern of IB claimants in the UK, i.e. that de-industrialization in the 'North' in the 1980s and 1990s resulted in large numbers of the 'hidden sick' losing their jobs in concentrated geographical areas. Their argument is supported by case study evidence (e.g. BEATTY and FOTHERGILL, 1996, 2002; FIELDHOUSE and HOLLYWOOD, 1999).

There is econometric evidence from cross-section micro-studies on the role of health in disability benefit receipt in the UK. Since there are spatial differences in health, one can, therefore, infer spatial differences in disability benefit rolls from these studies. MOLHO (1989) finds age and health proxies to be significant determinants of entry probabilities to IVB, with intuitive signs, for a 1983/84 cross-section of men sampled from NI records. MOLHO (1991) presents similar findings for a sample of women from the same source. DISNEY and WEBB (1991) estimate probit models for the probability of IVB receipt using cross-section micro-survey data for 1980, 1984 and 1988, and find significant age effects. Their only observed health measure is smoking, however, so they cannot provide further evidence on the role of health in explaining spatial disability benefit patterns. HOLMES and LYNCH (1990) and LYNCH (1991) find age and health measures to be significant determinants of the hazard rate for offflow from disability benefits for male and female micro-samples of NI records for various years in the early 1980s. ERENS and GHATE (1993) present similar findings for tracking a sample survey of the 1991/92 IVB entrant cohort. In addition to general health proxies, both MOLHO (1989) and LYNCH (1991) find a significant industrial sector dummy for previous employment in mining or related occupations.

More recently NOLAN and FITZROY (2003) use 1999–2001 cross-section data to estimate simple (described by the authors as preliminary) regressions for the proportion of Local Authority populations claiming IB. They find a positive dependence on both local mortality rates and the rate of hospital consultant episodes. As yet, however, their models do not include any labour market controls. BEATTY and FOTHERGILL (1999) estimate a dichotomous choice model (between claiming unemployment benefits (Jobseeker's Allowance, JSA) or claiming IB) for a sample of men out of work for 6 months or more across seven different locations in the UK. They find a binary indicator for the presence of (self-reported) ill-health to be positively and significantly correlated with the probability of claiming IB rather than JSA, but again they do not control for labour demand factors. Moving away from studies specifically on disability benefit rolls, a few recent papers examine the link between health and labour market inactivity at a regional level. O'LEARY *et al.* (2005) use pooled Labour Force Survey (LFS) data from 1997–2000 to estimate a multinomial logit model of labour market state and conclude that the incidence of ill-health explains around one-third of the regional variation in inactivity in the UK. Their measure of ill-health is self-reported, however, and they too do not include labour market controls. FAGGIO and NICKELL (2005) use various survey data to estimate regressions of regional prime age male inactivity rates and find no significant link with their health measure (the sample proportion reporting a long-term limiting illness). They do include labour demand controls in their model but find counterintuitive results, e.g. vacancy rates and employment growth are positively correlated with inactivity, which lead them to be dropped. This, however, has little effect on the (in)significance of their health measure. Finally, DISNEY *et al.* (2002) use British Household Panel Study (BHPS) data from 1991–98 to estimate the link between health shocks to individuals – with self-reported health instrumented by an objective 'health stock' variable – and changes in economic activity status (retirement). Having controlled for local unemployment rates amongst other factors, health shocks are found to be highly significant in explaining moves to economic inactivity. This relationship is *not* affected by the 1995 reforms replacing IVB with IB, which suggests little impact of benefit 'supply' changes on moves to inactivity (as opposed to flows onto disability benefits themselves).

Now consider the effects of labour market factors on spatial patterns in disability benefit rolls other than those that work indirectly through health. Might one find similar effects of labour demand factors on local or regional disability benefit rolls for a given incidence of

disability, as have been suggested in the USA? There is a wide variation in employment rates of the disabled across space within the UK. For example, in Hackney (inner London), only 20.9% of the working-age disabled (self-reported) are in employment compared with 76.9% in Richmond-upon-Thames (outer London) (Annual Local Area Labour Force Survey).[11] Can labour demand differences explain these differences in employment rates?

It is generally believed that local or regional unemployment rates – claimant count or ILO measures – are positively correlated with local or regional disability benefit rolls and more generally with inactivity rates (e.g. GREGG and WADSWORTH, 1999; BEATTY *et al.*, 2000; ALCOCK *et al.*, 2003; DWP, 2003; ANYADIKE-DANES, 2004). Fig. 7 shows just such a correlation at the regional level for the UK. This is sometimes envisaged as a direct causal relationship between unemployment and disability benefit rolls (e.g. what BEATTY *et al.*, 2000, call 'benefit shift'), but more often as one where unemployment rates, disability benefit rolls and inactivity rates are commonly influenced by labour demand.[12]

There has been little in the way of econometric testing of this relationship in the UK since the early 1990s, however, and the evidence from these earlier studies (which tend to specify a linear relationship between unemployment and disability benefit receipt or inactivity) appears somewhat mixed. MOLHO (1989) finds local unemployment rates to be insignificant in a 1983/84 micro-cross-section study of male entry to IVB, although individual unemployment histories are found to have a significant effect on the probability of entry to IVB. DISNEY and WEBB (1991) find intuitively signed (i.e. positive) significant effects of local unemployment rates on the probability of IVB receipt using repeated cross-section survey data for the 1980s. As mentioned above, however, Disney and Webb cannot control satisfactorily for health in their cross-section models given the only observed health measure is an individual's smoking habits. They also estimate a pooled regional cross-section time-series model with the same data, arguably controlling for (time-invariant) unobserved health differences across regions through the fixed effects. Again, they find significant unemployment rate effects. In fact, they conclude that unemployment rates are the key factor explaining regional disability benefit rolls. HOLMES and LYNCH (1990) and LYNCH (1991) find local unemployment rates to be (negatively and) significantly related to hazard rates for off-flow from IVB for men. For women – particularly married women – MOLHO (1991) finds strong, significantly positive effects of lagged local unemployment rates on the probability of entry to IVB. LYNCH (1991), however, finds local unemployment rates to be insignificant in a hazard rate model of IVB off-flow for women.

More recently, BURCHARDT (2003) finds the regional unemployment rate to be significantly related to the duration in continued employment following the onset of disability. In broader inactivity terms, DISNEY *et al.* (2002) find a negative and significant relationship between local unemployment rates and moves into retirement. FAGGIO and NICKELL (2005), however, find counterintuitive, positively signed coefficients on proxies for labour demand in regional regressions for prime age male inactivity.

As well as differing degrees of control for disability prevalence, a possible factor in the mixed evidence regarding unemployment rates and disability benefit rolls is the growing feeling that unemployment rates

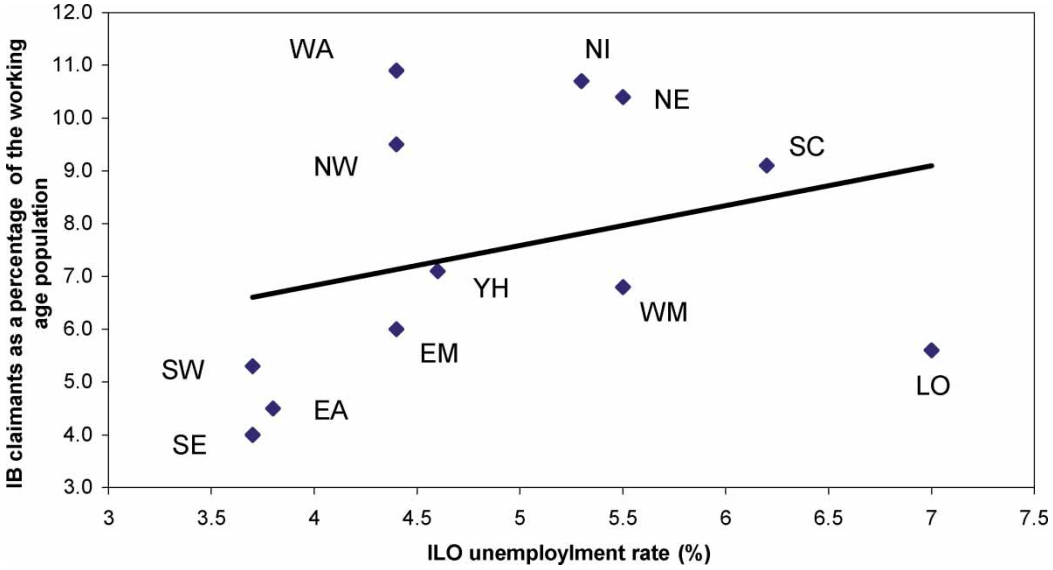

Fig. 7. *Correlation of Incapacity Benefit claimants as a percentage of the working age population rolls and International Labour Organization (ILO) unemployment rates by UK region, February 2004*

Notes: The equation corresponding to the marked line of best fit is: Incapacity Benefit (IB) = 3.81 + 0.76*ILO; $R^2 = 0.1$

may not reflect accurately the state of the labour market because many of what one might think of as the 'real unemployed' – those discouraged workers that say they would like to work but have given up searching for jobs – are not included in the claimant count or ILO measures (e.g. GREEN, 1997; GREGG and WADSWORTH, 1999; MACKAY, 1999; ERDEM and GLYN, 2001; FOTHERGILL, 2001; ANYADIKE-DANES, 2004). Even ignoring the possibility of measurement error, if labour demand factors are a common cause of both unemployment and disability benefit rolls, then one might expect evidence from simple linear regressions of disability benefit rolls on local unemployment rates to be mixed. Unemployment and inactivity may be both complements and substitutes. Various case studies have suggested that recorded unemployment and recorded disability have indeed – at certain times in certain places – been negatively related (e.g. BEATTY and FOTHERGILL, 1996, 2002; FIELDHOUSE and HOLLYWOOD, 1999; BEATTY *et al*., 2000).[13]

The US literature suggests two main causal links from labour demand to patterns of disability benefit receipt: through job destruction and through replacement rates. The quantitative UK literature of the early 1990s does not test the job destruction link directly, although, as noted above, some studies do find significant mining or related previous occupation dummies. Case study evidence, however, such as that presented in BEATTY and FOTHERGILL (1996, 2002), suggests this is a key factor behind the observed patterns in disability benefit rolls in the UK, particularly for job destruction in mining and heavy manufacturing, at least for men. Not only did such job destruction lead directly to disabled former workers claiming disability benefits, but also BEATTY *et al*. (2000) argue that in areas of low labour demand, many of those disabled who entered unemployment soon became disenchanted with job searching, leading to a further 'benefit shift' from unemployment onto disability benefits. Deindustrialization and the decline of mining, however, were particularly rapid in the 1980s and early 1990s, and particularly so in the 'North'. It is uncertain whether job destruction in heavy industry is as important a factor in recent years, particularly given that the rise in disability benefit rolls nationally is being driven primarily by increasing numbers of female claimants.

Just as for the USA, disability benefit rates are set nationally in the UK, despite wage differentials between regions (notably between London and the South East of England and the rest). Over time, they are linked to prices rather than to average earnings and, unlike the USA replacement rates, are more likely to have been falling rather than rising, even for the low-skilled. There is a similar spatial replacement rate route, however, through which local labour demand conditions, via labour supply, might affect disability benefit rolls, i.e. that in low-wage regions, IB is relatively generous in comparison with high-wage regions. There is some econometric evidence that the relative generosity of disability benefits plays a role in disability benefit claimant rates across space in the UK. Micro-cross-section studies have found correctly signed significant effects for men of previous pay and benefit rates on the probability of claiming IVB (MOLHO, 1989) and the hazard rate for off-flow from IVB (HOLMES and LYNCH, 1990; LYNCH, 1991). Similar results are found for women (LYNCH, 1991; MOLHO, 1991). DISNEY and WEBB's (1991) pooled regional cross-section time-series model also suggests correctly signed and significant real benefit level effects. More recently, FAGGIO and NICKELL (2005) find a strong negative relationship between regional wages and prime age male inactivity. This relationship is stronger still between regional wages and regional rates of inactivity restricted to those inactive on health grounds.

One further route through which labour demand might have affected disability benefit rolls is the behaviour of doctors as 'gatekeepers' of IVB in the past. RITCHIE *et al*. (1993) suggest this may have been influenced by the state of the local labour market with doctors more likely to certify individuals as entitled to IVB where they felt their chances of getting a job were low. Since the 1995 reforms, however, Benefits Agency doctors have replaced local general practitioners as the administrators of IB and medical assessment of claimants' capability for work has tightened.

This now brings this section to the role played by the nature of disability benefits themselves, e.g. in terms of coverage and stringency of screening, in driving disability benefit rolls. As for the US disability benefit 'rules' are set nationally, but the benefits are administered locally. Consequently, there may be some scope for implementation differences on the ground that could potentially lead to spatial differences in claimant rates. There is no clear evidence for this in the case of the UK, however, other than claims that employment services in some areas may have directed some of the disabled long-term unemployed onto IVB in the 1980s (e.g. BEATTY *et al*., 2000; WEBSTER, 2002). It is possible that (nationally) tougher eligibility criteria associated with the replacement of IVB with IB in 1995 may have had a disproportionate effect on regions with high disability benefit claimant rates – this is consistent with the apparent convergence in headline claimant rates shown by Fig. 6 – but this question is yet to be examined in the literature.

The US literature also suggests that the nature of alternative benefits, e.g. the generosity and availability of state general assistance, may have played a role in the national growth and spatial pattern of disability benefit rolls. The UK does not have equivalent state-level benefits, but various authors have suggested that the nature of alternative national-level benefits, particularly unemployment benefits, have played a role in the growth of national claimant numbers

(e.g. DISNEY and WEBB, 1991; BEATTY *et al.*, 2000; ALCOCK *et al.*, 2003). Arguably, growing incentives to claim disability benefits in preference to unemployment benefits may have strengthened the relationship between regional labour demand conditions and regional disability benefit rolls over time. Also, differentials in benefit rates between unemployment and disability benefits may have more impact in low- than in high-price regions. Further, BLUNDELL and JOHNSON (1998) argue that the nature of the UK pension system creates incentives to use disability benefits as an early retirement vehicle, particularly for low earners. This might, therefore, contribute to any spatial relationship between age distributions and disability benefit rolls.

Finally, some UK cross-section studies have found significant regional dummies that remain unexplained, even after controlling as far as possible for the kinds of factors discussed above (e.g. MOLHO, 1989; DISNEY and WEBB, 1991; FAGGIO and NICKELL, 2005).

SUMMARY AND CONCLUSIONS

Both the US and UK literatures suggest that labour demand and benefit characteristics together with demographic and health factors play a role in explaining observed spatial differences in disability benefit claimant rates. Few studies concentrate on the spatial aspect of disability benefit rolls, however, in either the USA or the UK. Many of those that do so omit potentially key variables, e.g. some papers that focus on health explanations often omit controls for labour demand and vice versa. Even where specifications do attempt to take account of the various observed factors thought to influence disability benefit rolls, difficulties with the measurement of disability and the complex causal interactions between key variables make it difficult to draw firm conclusions about the size and strength (and sometimes even sign) of relationships driving disability benefit rolls. Further, with a few notable exceptions, existing econometric studies of UK disability benefit rolls date back to the late 1980s and early 1990s. Things have changed since then, e.g. in terms of continued national growth in disability benefit rolls, the growing share of women in overall disability benefit rolls, sustained falls in unemployment, and major reforms to alternative benefits and to disability benefits themselves.

Taken together, these facts suggest a need for extensive further quantitative analyses of spatial patterns in disability benefit claimant rates both in the UK and the USA. This paper is intended as a small step towards building on the body of existing research – and there is already much to learn from this literature – to start to quantify more precisely the explanations for spatial patterns in disability benefit rolls. What is clear is that this is a complex area, and that a significant body of quantitative work may be needed the better to pin down the role of health and disability prevalence, the role of local labour markets both directly and indirectly, and the robustness to alternative measures of these and other relevant factors.

This research progress is all the more important since the growth and distribution of disability benefit rolls are highly policy relevant issues, e.g. in terms of the capacity of labour markets, the costs to the taxpayer, and, more specifically, at least in the UK, in terms of the sheer number and variety of recent, current and planned policy reforms aimed at getting some of those currently claiming disability benefits (back) into work. Perhaps more importantly, those who are inactive and claiming disability benefits are more likely to be at risk from social exclusion than those with disabilities in employment, although, of course, employment will not be appropriate for many. Spatially, whole communities may be at risk from social exclusion where disability benefit claimant rates are particularly high, e.g. Easington in the North East of England or Merthyr Tydfil in Wales, where over one-quarter of working-age men are claiming disability benefits. Where disability benefit receipt becomes the 'norm', it may be more difficult for policy-makers to stimulate re-entry into the labour force. Surprisingly, the possibility that disability benefit rolls may be influenced by social interaction factors, e.g. because an individual's utility function may in part depend on 'fitting in' with those around him/her, has so far received little attention in either the US or UK literature. This, too, data permitting, should be on the agenda.

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NOTES

1. Figures are for the UK, including Incapacity Benefit and severe disablement allowance claimants.
2. Amongst other things, the 1995 reforms phased out sickness and disability benefits for the over 65s (men) and over 60s (women), and falling headlined figures reflect this rather than any fall in working age benefit rolls.
3. The US literature distinguishes claimant rates (including unsuccessful claims) from recipiency rates. The UK literature tends to use the terms 'claimants' and 'recipients' interchangeably, with those ineligible for benefits not being included in UK claimant figures. This paper follows this rather loose UK terminology, with the term 'claimant', in the UK context, implying someone 'in receipt of' disability benefits. In the US context, the

paper will follow convention and use the term 'recipiency'.

4. Since 1995, the fastest *growth* in (overall) IB rolls has been in those areas with the lowest *levels* of IB rolls (the South of England) and the slowest growth has been in those areas with the highest levels (Wales and the North East of England). This is not necessarily the case for working age disability benefit rolls for which regional data before 2001 proved difficult to find.
5. Some studies suggest that population ageing plays some role in the *total number* of disability benefit claimants (e.g. RUPP and STAPLETON, 1995).
6. Mental health impairments now account for one-quarter of all SSDI awards (SOCIAL SECURITY ADMINISTRATION, 2002).
7. Source: Disability Status Census 2000 Brief, US Census Bureau.
8. BOUND and BURKHAUSER (1999) discuss an earlier version of this study.
9. There has also been variation in the degree of disability benefits outreach activity conducted by the US Social Security Administration over time, and across space, which is argued by some to have influenced disability benefit rolls (e.g. QUADANGO, 1997; BOUND *et al.*, 1998).
10. Source: UK Health Statistics. London: The Stationary Office.
11. Of course, residential segregation (between rich and poor, old and young) as well as labour market factors may influence disability benefit rolls at the local level, e.g. between London boroughs. The author thanks an anonymous referee for this point.
12. DWP (2003) suggests these relationships are not strong, although this argument appears to be based on correlations between benefit rolls and reported vacancy data, which are known to be seriously flawed.
13. BEATTY and FOTHERGILL (2002), for example, report evidence from a case study of a particular shipbuilding town in the North West of England where major job losses in the shipbuilding industry were accompanied by rising recorded disability among men but falling unemployment. For a similar picture for coal mining towns, see BEATTY and FOTHERGILL (1996).

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