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# **Regional Variations in the Competitiveness of Unemployed Job-Seekers and the Rate of Outflows from Unemployment**

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### **Abstract**

The paper examines the role of variations in the competitiveness of unemployed job-seekers in leading to regional variations in the rate of outflows from unemployment, and attempts to identify the factors responsible for regional variations in the share of new hires captured by the unemployed. The paper's empirical analysis suggests that the duration structure of unemployment, measured by the rate of inflows into unemployment relative to the beginning of period stock, is the primary determinant of the competitiveness of a region's unemployed job-seekers.

**JEL categories: J64, R23**

## 1. Introduction

Following the work of Burgess (1993), a number of recent studies have emphasised the role of competition between unemployed and employed job-seekers in determining the rate of outflows from unemployment.<sup>1</sup> The basic tenet of these studies is that the share of new hires captured by the unemployed may be expected to vary over time and space depending on the level of job search activity amongst those already in employment and the degree to which the unemployed are effective competitors in the market for jobs. In this paper, we seek to apply this framework to the analysis of unemployment flows in the regions of Great Britain. We examine the extent to which variations in the 'competitiveness' of unemployed job-seekers, as opposed to variations in the rate of new hires, contribute to an explanation of regional variations in the rate of outflows from unemployment over the period from 1983 to 1994. There have been many previous studies of regional unemployment in the UK (for recent examples, see Evans and McCormick, 1994, Martin, 1997, and Taylor and Bradley, 1997) but these have tended to concentrate on the analysis of unemployment stocks. By focusing instead on the outflows from unemployment, the present paper aims to bring a relatively fresh perspective to bear on the analysis of regional disparities in unemployment.<sup>2</sup>

In common with Burgess's work using aggregate data, we find that variations in the rate of new hires - which we proxy using data on vacancy flows - play only a relatively minor role in accounting for variations in the rate of outflow from unemployment across the British regions. Far more important are regional variations in the proportion of new hires captured by the unemployed. We examine a variety of possible causes of these variations and find that the

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<sup>1</sup>Empirical studies include papers by van Ours (1995), Baker *et al.* (1996), Broersma (1997), Dor *et al.* (1997) and Mumford and Smith (1999). For a theoretical analysis of the implications for unemployment transitions of the existence of on-the-job search, see Pissarides (1994).

<sup>2</sup>Martin and Sunley (1997) examine the extent to which variations in the pattern of flows into and out of unemployment account for the disparities in British regional unemployment rates, but do not attempt to explain the regional variation in unemployment flows. Studies of the determinants of spatial variations in outflows from unemployment at the sub-regional level have been carried out by Bennet and Pinto (1994), Coles and Smith (1996) and Burgess and Profit (1998), whilst Armstrong and Taylor (1985) present an analysis of spatial variations in the rate of inflows into unemployment in the North West of England. van Ours (1995) uses regional level data to study the determinants of outflows from unemployment in the Netherlands.

most significant influence is the duration structure of regional unemployment. Specifically, we find that the rate of outflows from unemployment is highest in regions where there is a high rate of inflows into unemployment relative to the beginning of period stock, so that a relatively high proportion of the unemployed have relatively low durations of unemployment. A high rate of in-migration to the region relative to the civilian workforce is also found to have a beneficial effect on the rate of outflows from unemployment at a given rate of new hires. On the policy front, we find relatively little evidence that the Restart programme has led to significant regional variations in unemployment flows.

The pattern of the paper is as follows. In Section 2 we present a picture of recent developments in the rate of outflows from unemployment at the regional level and provide a preliminary indication of the extent to which these developments may alternatively be attributed to variations in the rate of new hiring or to variations in the share of new hires in each region which is captured by the unemployed. This Section also sets out the analytical framework within which we try to explain the observed pattern of regional variations in outflows from unemployment. In Section 3 we present the results of an econometric investigation into the causes of these regional variations in outflow rates based on pooled cross-section - time-series data for the ten regions of Great Britain for the years 1984-94. In Section 4, we use the results of this analysis to try to provide a breakdown of the causes of inter-regional variations in the average rate of outflows from unemployment over this eleven year period. Finally, in Section 5 we offer some concluding remarks.

## 2. Regional Variations in Hiring and the Share of New Hires Captured by the Unemployed

Figure 1 provides a perspective on the issues which we seek to investigate. It shows, for each of the standard regions of Great Britain, the rate of outflows from unemployment,  $x$ , and the rate of new hires,  $h$  (both expressed as a percentage of the labour force), over the period 1984-94, together with their ratio.<sup>3</sup> The rate of new hires in each region is proxied using data on outflows of vacancies previously notified to job-centres, adjusted to allow for the fact that only a fraction of total vacancies are notified to job-centres.<sup>4</sup>

It is immediately apparent from the graphs that - as found in Burgess's study of aggregate data - the rate of outflows from unemployment is only loosely related to the rate of new hires and that there are significant regional and temporal variations in the ratio of unemployment outflows to vacancy outflows. The pattern of temporal variations is clearly counter-cyclical in all regions. In terms of general trends across the sample period, however, there are three fairly distinct regional groups. In the South East, East Anglia and the South West, there is a discernible upward trend in  $(x/h)$  over the period; in East and West Midlands no trend is apparent; whilst in the remaining regions - and most notably in Wales and Scotland - the trend is reversed. Across regions, the ratio  $(x/h)$  tends to be highest in Yorkshire and Humberside and the North, and lowest in the South East and the North West.

One might reasonably expect the variations in  $(x/h)$  to be closely related to variations in the proportion of unemployed job-seekers in the workforce ( $u$ ). However, using regional average data for the period as a whole, Figure 2 shows that although there is indeed a positive relationship between these two series, it is not overwhelming and there are clearly other factors at work which influence regional differences in the share of new engagements captured by the unemployed.

To investigate more precisely the role of the rate of new hires in leading to variations in regional rates of outflows from unemployment, and the factors which influence the share of

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<sup>3</sup>This is essentially a reproduction, at the regional level, of the diagrammatic analysis presented by Burgess using aggregate data. See figure 2 on p.1192 of Burgess (1993).

<sup>4</sup>The vacancy outflow figures for each region are multiplied by the ratio of an estimate of aggregate engagements based on Inland Revenue P45 data to the aggregate level of vacancy outflows. I am grateful to Stephen Nickell for supplying me with the P45 data.

the unemployed in new engagements, we use a variant of the framework employed by Burgess (1993) and more recently by Broersma (1997), i.e. we hypothesise that the rate of outflows from unemployment in region  $i$  in time period  $t$  is given by:

$$x_{it} = \lambda_{it} u_{it} \theta_{it} \rho_{it} \quad (1)$$

where  $\theta$  denotes the arrival rate of job offers,  $\rho$  the offer acceptance rate, and  $\lambda$  measures the relative success of the unemployed in attracting job offers.  $x$  and  $u$  are as previously defined.

The derivation of equation (1) is based on the notion that the chance that an unemployed job-seeker obtains a job is  $\lambda$  times that of an average job-seeker. So if  $H_u$  denotes the number of hires from unemployment during a particular period (dropping the region and time subscript for convenience) and  $H$  is the total number of hires, we have

$$H_u / U = \lambda H / J \quad (2)$$

where  $U$  is the number of unemployed and  $J$  denotes the total number of job-seekers, with  $H/J = \theta\rho$ . Multiplying both sides of (2) by  $u = U/L$  where  $L$  is the labour force, and ignoring outflows associated with exits from the labour market, leads to equation (1).

The contribution of the job competition approach is to note not only that the unemployed will be competing for jobs with job-seekers who are already in employment but also that the number of employed job-seekers will tend to vary with the state of the labour market. In particular, Burgess (1993) notes that the proportion of employed workers engaging in on-the-job search will tend to be an increasing function of the job offer arrival rate, as a higher arrival rate of job offers raises the prospective returns to on-the-job search. An implication of this is that, other things equal, the elasticity of the unemployment outflow rate with respect to an increase in the rate of new hires will tend to be less than one. Likewise, a rise in the unemployment rate will tend to produce a less than proportionate decrease in the job offer arrival rate  $\theta$  as higher unemployment will tend to reduce the number of individuals engaging in on-the-job search.

At the regional level, we need to amend the basic framework above to allow for the possibility that a portion of new hires may be taken by workers from outside the region, whilst a number of job-seekers within the region may be tempted to migrate to seek or take up

employment elsewhere. We therefore specify the number of persons seeking jobs in region  $i$  as (again without the time subscripts):<sup>5</sup>

$$J_i = \tau_i^U U_i + \tau_i^N \phi_i(\theta_i, \mathbf{Z})N_i + \phi_i J_{-i} \quad (3)$$

where  $U_i$  denotes the number of unemployed workers in region  $i$ ,  $N_i$  is the number in employment, and  $J_{-i}$  denotes the number of job-seekers presently located outside the region.  $\tau_i^U$  and  $\tau_i^N$  respectively denote the proportions of the region's unemployed and employed job-seekers ( $\phi_i N_i$ ) who are seeking work inside rather than outside the region, whilst  $\mathbf{Z}$  denotes a vector of variables which influence the propensity of employed workers to engage in job search at a given value of  $\theta$ .

Equation (3) further indicates why at the regional level an increase in the rate of hiring may be expected to lead to a less than proportionate increase in the outflow rate from unemployment. Not only will the increase in hiring tend to lead to an increase in the proportion of employed workers in the region engaging in job search, but it may also be expected both to raise the rate of in-migration from job-seekers outside the region (i.e. by increasing the value of  $\phi_i$ ) and reduce the incentive for employed job-seekers within the region to migrate to take up employment elsewhere (hence, raising  $\tau_i^N$ ).<sup>6</sup> More generally, the equation suggests that we should expect the arrival rate of job offers for job-seekers in region  $i$  to be negatively related to the regional rate of in-migration and positively related to the rate of out-migration.<sup>7</sup>

The vector  $\mathbf{Z}$  is comprised of essentially two elements. Firstly, we follow Burgess and hypothesise that the number of employed workers in the region engaging in job search will be a decreasing function of the unemployment benefit replacement rate. The explanation for this is that a high rate of unemployment benefit relative to earnings will tend to reduce the

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<sup>5</sup>We ignore the existence of job-seekers who may be resident in the region but who are currently outside the workforce.

<sup>6</sup>For an analysis of the role of differential hiring rates, and other factors, in leading to regional migration flows, see Jackman and Savouri (1992).

<sup>7</sup>There are two points to note here. Firstly, as there is no particular reason to suppose that in and out migration will impact equally on the number of regional job-seekers we do not impose the restriction that the job offer arrival rate will be dependent only on the regional rate of *net* migration. Secondly, in estimation we will need to allow for the possibility that the regional rates of in and out migration may themselves be dependent on the rate of outflows from unemployment.

disutility associated with a spell of unemployment so that any employees faced with the prospect of losing their job may be less motivated to engage in on-the-job search prior to being made redundant. As benefit scales are fixed at the national level, we would expect such an effect, if relevant, to manifest itself in the form of a negative relationship between  $\theta_{it}$  and the level of regional average earnings.

Secondly, we allow for the possibility that the incentives for employed individuals to engage in on-the-job search may be influenced by developments in the national economy (for example, an increase in benefit scales or an increase in the aggregate rate of new hires) as well as region-specific factors. In order to capture the influence of these macroeconomic factors, which we assume to impact equally on all regions, we include a set of time dummies in the specification of  $\mathbf{Z}$ .

The term  $\lambda_{it}$  in equation (1) measures the relative success of the unemployed in attracting job offers. We expect this to be a function of the age, duration and spatial structure of the regional unemployment stock, plus a variety of other factors which we consider in detail below. Concerning the age structure of unemployment, we hypothesise specifically that  $\lambda$  will be an increasing function of the proportion of young workers (i.e. those aged under 25) in the regional unemployment stock, and a decreasing function of the proportion of older workers (those aged 55 or over, or from 1989, 50 or over). The supporting arguments here are well known: young unemployed workers may be expected to be relatively active searchers in the job market and relatively effective in competition with employed job-seekers, whilst for older workers the reverse is likely to be true.

In common with Burgess (1993) and Broersma (1997), we hypothesise that the share of new hires taken by the unemployed will be smaller the higher the proportion of long-term unemployed in the unemployment stock. This may either be because the experience of unemployment itself reduces a person's chance of obtaining a job - because they become discouraged from engaging in job search, become progressively de-skilled, or because they become stigmatised by employers - or because those entering long-term unemployment are more likely to be relatively ineffective competitors in the job market.<sup>8</sup> In the empirical

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<sup>8</sup>For attempts to discriminate between these 'state dependence' and 'worker heterogeneity' explanations for the relationship between the proportion of long-term

analysis below, we attempt to capture the effect of the duration structure of unemployment in two ways: first, by including in the list of explanatory variables the proportion of the beginning of period unemployment stock who have been unemployed for at least one year, and second, by including the ratio of current inflows into unemployment to the beginning of period stock. The latter is expected to be positively related to the outflow rate.

Following the work of Coles (1994) and Coles and Smith (1995), Gregg and Petrongolo (1997) suggest a second reason why the proportion of new hires captured by the unemployed may be positively related to the ratio of unemployment inflows to the beginning of period stock. They suggest that new entrants to unemployment may be able to select from a bigger pool of job vacancies than their counterparts with longer durations. New entrants may potentially be able to match with a newly notified vacancy or with a vacancy from the existing stock. The latter, however, are assumed to have already been sampled and rejected by the existing unemployed, who are therefore able to match only with the flow of newly notified vacancies. Consistent with this proposition, Gregg and Petrongolo show, using aggregate data for the UK, that variations in the level of inflows into unemployment in a given period appear to have a much stronger effect on the level of outflows than do variations in the beginning of period unemployment stock.<sup>9</sup>

With regard to the spatial structure of unemployment, our hypothesis is that the share of new hires won by the unemployed in a region will be negatively related to the variance of unemployment rates between the constituent counties of the region concerned. Two arguments may be made in support of this. Firstly, if the unemployed are unevenly distributed within a region they may be less likely, other things being equal, to come into contact with a job vacancy. Secondly, if unemployment is concentrated in particular local labour markets, the social pressure on the unemployed in those areas to engage in active job search may be relatively weak.

### *Restart*

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unemployed and outflows from unemployment, in the context of aggregate time-series data, see Jackman and Layard (1991) and van den Berg and van Ours (1994).

<sup>9</sup>The issue of competition between unemployed and employed job-seekers is ignored in Gregg and Petrongolo's empirical analysis.

In addition to the above, we investigate the impact of three further potential influences on the relative success of unemployed job-seekers in the market for new hires. The first of these is the Restart programme. This scheme, introduced in 1986 and initially targeted at those with unemployment durations of six months or more, aims to assist the unemployed in the process of finding a job or a place on a training programme. During the initial years of its operation, the scheme consisted of a sequence of interviews between the unemployed individual and a Restart counsellor, during which the latter would assess the individual's availability for work, offer advice on benefit entitlement, job search behaviour and the availability of training programmes, and possibly even initiate direct contact with employers (Dolton and O'Neill, 1996). Failure to attend an appointment for a Restart interview could result in disqualification from receipt of unemployment benefit, and the interview process itself could result in the reduction or suspension of a person's benefit payments if they were deemed not to be making genuine efforts to find work. In more recent years, the spread of the scheme has broadened so that whilst the basic outline and objectives remain the same, the 'Restart process' essentially has become one of more or less continual appraisal of a person's job search activities and eligibility for benefit.

Previous studies have investigated the effects of the Restart scheme on individual unemployment durations (Dolton and O'Neill, 1996) and reservation wages (Dolton and O'Neill, 1995), as well as the scheme's effect on duration-specific outflow rates from unemployment (Lehmann, 1993). Here, we offer a slightly different perspective on the scheme's effects by studying its impact on the outflow rate from unemployment at a given rate of new hires. In this sense, we may be able to obtain a more direct assessment of the scheme's effectiveness in raising the competitiveness of unemployed job-seekers.

### *Migration*

The second potential influence on  $\lambda_{it}$  which we investigate is the rate of regional migration. This has already been discussed as a potential determinant of  $\theta$ , the job offer arrival rate, where it was suggested that a high rate of regional in-migration may be associated with a reduction in the probability that an individual job-seeker within the region will receive a job offer, whilst a high rate of out-migration might serve to raise it. For many migrants, the

migration decision will be consequent on the acceptance of a job offer. However, for some - most likely unemployed - job-seekers the decision to migrate may be part of, rather than the outcome of, the job search process. They may be motivated to move into a particular region in the belief that their closer physical proximity may make them more likely to come into contact with a job vacancy within the region than if they had remained outside. To the extent that these workers are likely to be relatively active searchers in the job market, we might therefore expect a high rate of regional in-migration to be associated with a relatively high value of  $\lambda$ . Conversely, a high rate of out-migration, which removed the more active job-seekers from the regional unemployment stock would tend to reduce it.<sup>10</sup>

#### *New Firms, "Good" Jobs and "Bad" Jobs*

The final variable which we investigate in this context is the regional rate of new firm formation, as measured by the rate of new registrations for VAT.<sup>11</sup> The possible link between the rate of new firm formation and the share of new hires taken by the unemployed derives from the notion introduced by Pissarides (1994) that labour markets may generate two types of jobs: "good" and "bad". The former are characterised by higher levels of productivity, but also higher set-up costs, than the latter. Pissarides suggests that only unemployed job-seekers will be willing to take up "bad" jobs, as all existing jobs are at least as productive (and hence, as remunerative) as a "bad" job with zero tenure. Following this line of argument, we hypothesise that a high proportion of the jobs generated by the formation of new firms may be perceived, at least, by job-seekers to be "bad" jobs. It is well known, for example, that failure rates amongst young firms are relatively high (Storey, 1994), so that the expected duration of a job generated by a new firm will tend to be relatively short. If workers cannot costlessly return to employment following the loss of a job then job-seekers who are currently in employment may be reluctant to take up a job created by a new firm.

The final component of equation (1) is  $\rho$ , the offer acceptance probability. Here we

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<sup>10</sup>Additionally, we might extend the argument of Gregg and Petrongolo (1997), applied previously to the inflow into unemployment, and suggest that recent in-migrants may be able to match with a bigger pool of vacancies than the incumbent unemployed. This would reinforce the arguments leading us to expect a positive relationship between the rate of in-migration and the share of new hires captured by the unemployed.

<sup>11</sup>For a discussion of the limitations of new registrations for VAT as a measure of new firm formation, see for example, Robson (1996).

follow Burgess and Broersma and hypothesise that this will be mainly dependent on the benefit replacement rate. In the present context, this leads us to expect a positive relationship between the regional level of average earnings and the rate of outflows from unemployment which will tend to counter-act the negative relationship identified previously.

### 3. Empirical Analysis

For the purposes of empirical analysis, we take a log-linear version of equation (1) and substitute for  $\lambda_{it}$ ,  $\theta_{it}$  and  $\rho_{it}$  in terms of their hypothesised determinants. Introducing lags to allow for the presence of dynamics in the relationship between the explanatory variables and the regional unemployment outflow rate leads us to estimate an error-correction equation of the form:

$$\Delta \ln x_{it} = \alpha + \beta_1' \Delta \mathbf{W}_{it} + \beta_2' \mathbf{W}_{it-1} - \gamma \ln x_{it-1} + \text{region \& time dummies} + \varepsilon_{it} \quad (4)$$

where  $\mathbf{W}$  is the vector of explanatory variables discussed in the previous section (including the regional unemployment rate) and  $\varepsilon_{it}$  is a random error term.

To recap, the dependent variable in our analysis is the (first difference of the) log of the regional rate of outflows from unemployment relative to the civilian labour force, whilst the elements of  $\mathbf{W}$  are:  $u$ , the regional (beginning of period) unemployment rate; the regional rate of hiring,  $h$ , defined as the (adjusted) number of vacancy outflows relative to the civilian workforce; the regional rates of gross in and out-migration relative to the civilian workforce,  $img$  and  $omg$ ; regional average earnings,  $w$ ; the proportion of the (beginning of period) unemployed who are aged under 25,  $u25$ ; the proportion aged 55 or over (50 or over from 1989),  $older$ ; the proportion of the unemployed with durations of at least 52 weeks,  $ltu$ ; the ratio of current period inflows into unemployment relative to the beginning of period stock,  $inf$ ; the variance of unemployment rates between the constituent counties of each region,  $varu$ ; the number of Restart interviews conducted in each region as a proportion of the numbers unemployed for at least six months,  $rest$ ; and finally, the number of new registrations for VAT relative to the civilian labour force,  $vat$ .<sup>12</sup>

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<sup>12</sup>All the elements of  $\mathbf{W}$  appear in the equation in log form, apart from  $rest$ . Note that only the current dated value of  $inf$  is included in the equation as lagged values would be

The role of the time dummies in equation (4) has already been discussed. The region dummies are included to pick up any long-term factors which might lead to regional differences in the outflow rate from unemployment at a given rate of hires, including for example, the density of the regional job-centre network.

## Data

Before moving on to discuss the details of the empirical analysis, it is worth pausing to say a little more about the nature of the data on regional unemployment flows which we use in this study. The data are based on the flows of individuals into and out of the official monthly count of those claiming unemployment benefit. The figures are therefore subject to the same definitional changes and other discontinuities - chronicled in Martin and Sunley (1997) - which afflicted the official count of the stock of unemployed over the 1983-1994 period. In addition, however, it should be noted that the flow series relate to computerised claims only and therefore exclude a proportion of claimants - those whose claims were processed clerically - who would have been included in the official figures for the unemployment stock. The flow series therefore under-record the actual number of individuals moving in and out of unemployment. Most of the under-recording occurred with respect to outflows, in that a significant number of the unemployed who ceased to claim were not officially classified as outflows from unemployment. The scale of this under-recording problem declined significantly over the sample period, so that by the mid-1990s only a small proportion of claims were non-computerised.

On the face of it, there seems little reason to suppose that the impact of either the administratively induced changes to the definition of unemployment or the under-recording of unemployment flows will have differed significantly across the regions. Their effects should therefore be absorbed by the time dummies in the empirical model.<sup>13</sup> More troubling for the analysis of the present paper is that whereas the theoretical discussion of the previous Section focused on flows of individuals out of unemployment into employment, the data on

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collinear with *ltu*.

<sup>13</sup>One possible exception is the impact of Section 7 of the 1988 Social Security Act, which put some people aged 55 or over on pensions instead of unemployment benefit. The effects of this provision should be absorbed by the variable *older* in our model.

unemployment outflows embraces not only transitions into employment but also exits of individuals from the labour force. Studies by Green et al. (1997) and Martin and Sunley (1997) using Labour Force Survey data indicate that there are regional differences in the response of labour force participation rates to fluctuations in the business cycle. Whilst some of these regional differences in exits from the labour force - those associated with retirement flows, for example - may be captured by the explanatory variables in the model, our neglect of a more explicit consideration of this issue clearly weakens to some extent the power of the empirical analysis.

## Results

Equation (4) was estimated by Instrumental Variables on annual data for the ten standard regions of Great Britain for the period 1984-94 (i.e. a total of 110 observations), with the first difference of the logged rates of regional in and out-migration treated as endogenous.<sup>14</sup> The equation was then tested down in the usual way by deleting insignificant terms and reparameterising where appropriate. Finally, the preferred specification which emerged from this general-to-specific modelling exercise was re-estimated using a more parsimonious version of the original instrument set. The resulting equation is shown in column (1) of Table 1.

Most of the variables hypothesised as potential determinants of the regional rate of outflows from unemployment appear in the equation in some form - the exceptions being the regional level of average earnings and the proportion of older workers in the unemployment stock. The coefficient of the Restart variable is not statistically significant but indicates that the scheme may have had a weak effect in raising the competitiveness of unemployed job-seekers. We consider the interpretation of this finding in more detail below.

As might be expected, the results indicate that it is the regional rate of unemployment which is the dominant influence on the rate of outflows from unemployment as a proportion

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<sup>14</sup>The additional instruments used were the current and one period lagged values of regional house prices. The starting date for the sample period is dictated by the availability of data on regional unemployment and vacancy flows, which is first available from June 1983. The 1983 observations for  $x$  and  $h$  are based on flows for the second half of the year, with data on variables relating to the beginning of period stock of unemployment defined accordingly. Finally, the observations on  $img$  and  $omg$  for this year are computed by dividing the annual migration figures by two.

of the workforce. In contrast, the hiring rate,  $h$ , appears to play a relatively minor role - the estimates indicate that, other things equal, a 10 percent increase in the rate of new hires in region  $i$  leads in the long-run to just a 0.6 percent increase in the rate of outflows from unemployment. This finding corroborates the impression gained from the graphs in Figure 1 and is consistent with the results of Burgess (1993), who finds an aggregate hiring rate elasticity insignificantly different from zero for much of the sample period he studies.<sup>15</sup> We considered the possibility that simultaneity between  $\ln h_{it}$  and  $\ln x_{it}$  may have biased downwards our estimate of the hiring rate elasticity and tried instrumenting  $\ln h_{it}$  with the log of the rate of vacancy inflows but this made virtually no difference to the results.<sup>16</sup>

The estimates in column (1) suggest that we may impose the restriction that the long-run coefficients on  $\ln h_{it}$  and  $\ln u_{it}$  sum to unity. This restriction, which is easily accepted, implies that in the long-run the rate of outflows from unemployment relative to the beginning of period stock is proportional to the ratio of new hires to the number of unemployed, so that for example a doubling of the number of new hires and the number unemployed has no effect on the outflow rate from unemployment, which is intuitively appealing.<sup>17</sup> Column (2) of Table 1 reports the estimates obtained when this additional restriction is imposed. Finally, following Burgess's example, we investigated the possibility that there may be non-linearities in the determinants of the job offer arrival rate by adding terms in  $(\ln u_{it})^2$  and  $(\ln u_{it} \cdot \ln h_{it})$  to the equation shown in column (1). These additional terms turned out to be jointly insignificant ( $\chi^2(2) = 1.69$  versus a 5 percent critical value of 5.99) and therefore in contrast to Burgess we find no evidence of significant non-linearities.

Both of the reported sets of estimates indicate fairly clearly that regional variations in the rate of outflows from unemployment are primarily the result of variations in the share of new hires taken by the unemployed, rather than regional variations in the rate of hiring. The level of inflows into unemployment relative to the beginning of period stock appears to be the

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<sup>15</sup>Burgess estimates a non-linear relationship between the hiring rate and the rate of outflows from unemployment, in such a way that the hiring rate elasticity increases with the rate of unemployment. We consider the issue of non-linearity below.

<sup>16</sup>The estimates may be obtained from the author, on request.

<sup>17</sup>A chi-squared test of this restriction gives a value of 1.07, compared with a 5 percent critical value (with one degree of freedom) of 3.84.

dominant influence on the share of new hires captured by the unemployed, though there is also a much weaker long-run effect from the regional rate of in-migration. The positive coefficient which is found for the latter suggests that a buoyant inflow of migrants into a region leads to compositional changes in the region's unemployment stock which raise the average degree of competitiveness of unemployed job-seekers in the regional job market, and that this dominates the negative effect on outflows which is created by the associated reduction in the job offer arrival rate.

In addition to the above, there are strong region and time-specific effects on the regional rate of outflows from unemployment, illustrated by the highly significant values for the REG and TIME statistics, which test for the deletion of the region and time dummies, respectively. Table 2 reports the estimated parameters and t-ratios of the regional dummies for the equation in column (2) of Table 1 (East Midlands is the omitted region). From these it can be seen that, relative to the East Midlands, the rate of outflows from unemployment is significantly higher, other things equal, in East Anglia, Yorkshire and Humberside, and the South West .

In the short-run, we observe what might be seen as a more conventional migration effect, in that a high rate of out-migration appears to be associated with an increase in the rate of outflows from unemployment, as the exit of migrants raises the job offer arrival rate for those seeking work within the region. Additionally in the short-run, the regional rate of outflows from unemployment at a given rate of hiring appears to be a positive function of the proportion of young workers in the unemployment stock, the rate of new registrations for VAT and the variance of county unemployment rates. Of these findings, the first two are consistent with the theoretical conjectures advanced in the previous Section. The third, however, is contrary to the predicted effect and cannot easily be explained.

#### *Interpreting the Findings for Restart*

On the face of it, the results presented in Table 1 appear to suggest that the Restart scheme has had only very limited success in raising the outflow rate from unemployment. This would seem to contradict the evidence from previous studies (e.g. Lehmann, 1993,

Dolton and O'Neill, 1996) which suggests that Restart has indeed been effective in raising the job finding prospects of the unemployed. However, there are a number of ways in which these contradictory findings may perhaps be resolved. One possibility is that whilst Restart may have been effective in raising the outflow rate from long-term unemployment, the jobs gained by Restart interviewees were ones which might previously have been taken by the short-term unemployed. The Restart scheme may therefore have significantly affected the composition of the outflows from unemployment but had relatively little effect on the overall total. Lehmann, using quarterly data for 1982-92, finds some evidence of displacement effects of this sort but nevertheless finds that Restart had a positive overall effect on the aggregate rate of outflows from unemployment.

A more likely explanation is that there is simply insufficient independent variation in the data to enable us to identify a significant Restart effect. There is relatively little cross-section variation in the Restart variable and in most years it exhibits a fairly strong correlation with the regional rate of unemployment. Most of the independent variation in *rest* is therefore in the time dimension and in these circumstances Restart begins to look like a common macroeconomic shock. Much of the impact of Restart will therefore tend to be absorbed by the time dummies which are included in the estimated equations. It is interesting to note that when the time dummies are deleted from the regressions it becomes possible to identify a significantly positive Restart effect.<sup>18</sup>

### **Robustness Checks**

Finally in this Section, we perform two checks for the robustness of the regression results. First, we consider the issue of the homogeneity of the regression parameters across the regions. We have already noted that each of the reported regressions contains a highly significant set of regional dummies which allows for different regional intercepts in the relationship determining the rate of outflows from unemployment. In Table 3, we report the results of tests for homogeneity of the slope coefficients of the exogenous variables in the

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<sup>18</sup>Dropping the time dummies, however, results in a significant deterioration in the fit of the equations, indicating that the time dummies are picking up the effect of other common macroeconomic influences on regional outflows from unemployment, apart from Restart.

equation reported in column (2) of Table 1. The evidence from these tests indicates that allowing for region-specific intercepts is sufficient to capture any substantive heterogeneity in the determination of regional outflows from unemployment.<sup>19</sup>

As a second check we examine the effects of allowing for the biases which may be introduced by the presence of the lagged dependent variable in our estimated equations (see Nickell, 1981). To deal with these biases - which may potentially affect our estimates of the effects of  $u$ ,  $inf$ , and the Restart variable  $rest$ , as well as the coefficient for the lagged dependent variable - we re-estimated the equations in Table 1 with additional instruments for these variables, as well as  $\Delta \ln omg_{it}$  as before.<sup>20</sup>

The results of this re-estimation are presented in Table 4 and provide some interesting comparisons with the estimates previously reported. Amongst the newly instrumented variables, the coefficients for the unemployment rate and lagged outflows are of a broadly similar magnitude to those estimated previously, whilst the coefficient for  $rest$ , declines even further in significance. Elsewhere, the coefficients for the lagged level of the hiring rate variable and the rate of in-migration lose their statistical significance. It is difficult to offer a precise explanation for these changes but given the relatively small changes to the unemployment rate and lagged dependent variable coefficients it seems unlikely that they can be wholly explained in terms of biases in the estimates reported in Table 1. Nonetheless, they suggest that we should exercise a degree of caution in our interpretation of the estimates.

#### **4. Accounting for Inter-Regional Variations in Unemployment Outflows**

Notwithstanding the above, it is worth considering to what extent the estimates reported in the previous Section can help us to understand the causes of inter-regional variations in the rate of outflows from unemployment over recent years. In consideration of

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<sup>19</sup>Similar results were obtained for the equation in column (1) of Table 1 except that here there is some evidence of regional variation in the speed of adjustment towards long-run equilibrium - in particular, the speed of adjustment appears to be slightly quicker than average in East Anglia and Scotland, and slightly slower in the North - and in the Restart effect.

<sup>20</sup>The potential bias in our estimate of the coefficients for  $inf_{it}$  and  $rest_{it}$  arises from the possible correlation between past realisations of the equation error term and the denominator of each variable.

this issue, we follow the tradition of previous studies of unemployment flows and focus on variations in the rate of outflows from unemployment relative to the beginning of period stock, rather than the workforce as hitherto.<sup>21</sup> Table 5 shows the average annual value of the outflow rate so defined for the 10 British regions over the period 1984-94. The average outflow rate ranges from a high of 183 percent of the beginning of period stock in East Anglia to a low of 133 percent in the West Midlands.

To try to identify the factors responsible for these regional differences in outflow rates, we use the long-run solution to the equation in column (2) of Table 1 (minus the insignificant Restart effect); i.e.

$$\ln \hat{(x/u)}_i = \text{const}_i + 0.078 \ln (h/u)_i + 0.610 \ln inf_i + 0.043 \ln img_i \quad (5)$$

where the *i* subscript on the constant term denotes that this is region-specific. We use East Midlands as our benchmark region, and for each of the remaining regions calculate the difference relative to the East Midlands in the average value of each of the right-hand side variables in (5). Multiplying by the relevant long-run coefficient then enables us to obtain a breakdown of the predicted difference in the average rate of outflows between each region and the East Midlands, which in turn may be compared with the actual observed difference.

The results of this exercise are displayed in Table 6. These show first of all that for the majority of regions the predicted difference in outflow rates is remarkably close to the observed differential. The largest discrepancies are in the predicted differential for Wales and the West Midlands, which are each 1.1 percentage points less than the actual differential. The second major point is that for all of the regions except Scotland the dominant factor which explains the difference in outflow rates relative to the East Midlands is the difference in the level of unemployment inflows relative to the beginning of year stock. Thus, for example, the relatively high outflow rate in East Anglia may be largely attributed to the fact that a relatively high proportion of those in unemployment in the region at a given time have tended

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<sup>21</sup>In addition to the paper by Burgess, previous studies of outflows from unemployment in the UK using aggregate level data include Nickell (1982), Junankar and Price (1984), Pissarides (1986), Jackman and Layard (1991), Layard, Nickell and Jackman (1991), Lehmann (1993) and Harris (1996).

to be recent entrants to unemployment who, for reasons outlined in Section 2, tend to enjoy a relatively favourable competitive position in the job market. Conversely, the unemployed in the West Midlands have tended to comprise a relatively high proportion of individuals with relatively long durations of unemployment, who may therefore have tended to engage in relatively little job search activity and/or have been relatively unattractive to employers. The unemployed in the West Midlands have therefore tended to capture a relatively small proportion of new hires compared with their counterparts in the East Midlands.<sup>22</sup>

Compared with the ratio of inflows into unemployment, relative migration flows and the rate of hiring appear to play a relatively minor role. In particular, the results in Table 6 confirm the impression gained from the graphs in Figure 1, that differences in the rate of hiring account for only a very small proportion of differences in regional rates of outflows from unemployment.

## 5. Conclusions

We have investigated the determinants of regional variations in outflows from unemployment, focusing in particular on the role of variations in the competitiveness of unemployed job-seekers relative to those searching on-the-job. We have used an adjusted data on off-flows of vacancies notified to job-centres to proxy for the level of new hires in the regional economy and our empirical analysis indicates that variations in the rate of new hires account for only a small proportion of regional variations in the rate of outflows from unemployment. Instead, we find that variations in the share of new hires taken by the unemployed, reflecting variations in the degree to which the unemployed represent effective

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<sup>22</sup>An alternative interpretation of the dominant role found for the inflow rate relative to the beginning of period stock is that it merely reflects the fact that in a steady state the level of inflows into unemployment will be equal to the level of outflows. There are two objections to this. The first is that over the period 1984-94, unemployment cannot really be said to have been in a steady state. Nationally, there was a fall of just over 1 percentage point in the average rate of unemployment between these two years (*Economic Trends Annual Supplement*, 1997), and this was accompanied by significant changes in the regional structure of unemployment. Secondly, the effect which we identify for the inflow rate is obtained in the presence of a control for the rate of new hires and therefore represents the effect on the outflow rate at a given rate of hiring. If the 'steady state' interpretation were correct, it seems unlikely that we would be able to identify such a strong separate effect from variations in the inflow rate.

competitors in regional job markets, account for much of the observed inter-regional variation in outflows from unemployment.

The principal influences on the share of new hires captured by the unemployed appear to be the rate of inflows into regional unemployment relative to the initial stock and, to a much lesser degree, the rate of regional in-migration relative to the workforce. Both of these factors are associated with an influx into regional unemployment of a pool of relatively active competitors in the market for jobs and their effect is to raise the average competitiveness of unemployed workers in the region relative to other participants in the market for new hires. In the case of migration this effect outweighs the negative effect on outflows which arises from the inflow of in-migrants who move directly into jobs which might otherwise have been taken by the resident unemployed. However, discussion of the in-migration effect is tempered with a note of caution as the significance of this variable turns out to be sensitive to treatment of the biases which may arise from the presence of a lagged dependent variable in the regression specification.

On the policy front, we find that the Restart programme, which was designed to aid the unemployed in the process of finding work, has only a very limited role in explaining regional variations in outflows from unemployment. This finding, which appears to contradict the results of previous studies of the effectiveness of Restart, may perhaps be taken to indicate that Restart has had the effect of a common macroeconomic shock, the impact of which is therefore largely captured by the time dummies which we have included in our estimated equations.

The findings concerning the effects of Restart aside, the results of this study emphasise the importance to regional employment policy of measures aimed at raising the competitiveness of the unemployed in the market for jobs. Measures designed to facilitate a more even regional distribution of new hires by themselves, it seems, are unlikely to be successful in alleviating the problem of regional disparities in unemployment.

**Table 1. Determinants of Regional Unemployment Outflows***Dependent Variable:  $\Delta \ln x_{it}$* 

<i>Variable</i>	(1)	(2)
Constant	- 0.038 (0.28)	0.089 (0.91)
$\Delta \ln h_{it}$	0.110 (4.34)	0.104 (4.31)
$\ln h_{it-1}$	0.050 (2.22)	
$\ln (h_{it-1}/u_{it})$		0.061 (3.14)
$\ln u_{it}$	0.696 (17.12)	
$\Delta \ln omg_{it}$	0.232 (2.62)	0.179 (2.64)
$\ln img_{it-1}$	0.033 (1.51)	0.034 (1.67)
$\Delta \ln u25_{it}$	0.228 (3.86)	0.218 (3.94)
$\ln inf_{it}$	0.444 (11.80)	0.478 (22.46)
$\Delta \ln varu_{it}$	0.012 (2.80)	0.011 (2.79)
$rest_{it}$	0.0002 (1.01)	0.0001 (0.91)
$\Delta \ln vat_{it}$	0.085 (2.47)	0.071 (2.27)
$\ln x_{it-1}$	- 0.794 (16.10)	
$\ln (x_{it-1} /u_{it})$		- 0.783 (16.66)
—		
R <sup>2</sup>	0.995	0.995
REG	$\chi^2(9) = 38.9$	$\chi^2(9) = 44.1$
TIME	$\chi^2(10) = 132.1$	$\chi^2(10) = 149.3$
IVLM	$\chi^2(1) = 0.08$	$\chi^2(1) = 0.48$
SARGAN	$\chi^2(7) = 3.25$	$\chi^2(8) = 4.81$

IV estimates;  $\Delta \ln omg_{it}$  treated as endogenous. t-ratios based on heteroskedasticity-consistent standard errors are given in parenthesis below the coefficients. Additional instruments:  $\ln omg_{it-1}$ ,  $\ln vat_{it-1}$ , and the current and one period lagged values of regional average earnings, the proportion of older workers amongst the unemployment stock, and regional

house prices (all logged).

Sample: annual data 1984-94, 10 GB regions (n = 110).

Notes to Table 1

Each equation includes 9 region dummies and 10 year dummies; REG and TIME provide tests of the joint significance of these. IVLM denotes a statistic derived by Godfrey (1994) for testing for serial correlation (in this case of order one) in the disturbances of equations estimated by Instrumental Variables. A single regionally uniform coefficient is assumed under the alternative hypothesis. Finally, SARGAN denotes Sargan's test of instrument validity. Each of the test statistics described has an asymptotic chi-squared distribution with degrees of freedom given in parenthesis.

See text and Data Appendix for variable definitions and data sources.

## Table 2. Outflows From Unemployment - Regional 'Fixed Effects'

*Coefficients for the region dummies included in the equation reported in column (2) of Table 1.*

	<u>Coeff.</u>	<u>t-ratio</u>
South East	0.019	(1.39)
East Anglia	0.029	(4.78)
South West	0.010	(1.90)
West Midlands	- 0.013	(1.62)
Yorks & Humbs	0.018	(2.60)
North West	- 0.014	(1.14)
North	0.008	(1.03)
Wales	- 0.002	(0.54)
Scotland	0.024	(1.38)

*East Midlands is the omitted region.*

**Table 3. Tests for Homogeneity of Regional Slope Coefficients<sup>a</sup>**

<u>Variable</u>	<u>Chi-squared statistic<sup>b</sup></u>
$\Delta \ln h_{it}$	$\chi^2(9) = 15.31$ (0.08)
$\ln (h_{it-1}/u_{it})$	$\chi^2(9) = 9.93$ (0.36)
$\ln img_{it-1}$	$\chi^2(9) = 9.88$ (0.36)
$\Delta \ln u25_{it}$	$\chi^2(9) = 11.91$ (0.22)
$\ln inf_{it}$	$\chi^2(9) = 6.81$ (0.66)
$\Delta \ln varu_{it}$	$\chi^2(9) = 6.46$ (0.69)
$rest_{it}$	$\chi^2(9) = 14.70$ (0.10)
$\Delta \ln vat_{it}$	$\chi^2(9) = 10.39$ (0.32)
$\ln (x_{it-1}/u_{it})$	$\chi^2(9) = 2.40$ (0.98)

Notes

<sup>a</sup> Tests for homogeneity of the slope coefficients of the exogenous variables in the equation reported in column (2) of Table 1.

<sup>b</sup> P-values are reported in parenthesis alongside the test statistic.

*East Midlands is the omitted region.*

**Table 4. Outflow Equations with Additional Instrumented Variables.**Dependent Variable:  $\Delta \ln x_{it}$ 

Variable	(1)	(2)
Constant	0.018 (0.10)	0.087 (0.75)
$\Delta \ln h_{it}$	0.115 (4.48)	0.113 (4.37)
$\ln h_{it-1}$	0.025 (0.86)	
$\ln (h_{it-1}/u_{it})^*$		0.027 (0.93)
$\ln u_{it}^*$	0.651 (12.80)	
$\Delta \ln omg_{it}^*$	0.186 (1.81)	0.157 (2.09)
$\ln img_{it-1}$	0.022 (0.85)	0.022 (0.87)
$\Delta \ln u25_{it}$	0.251 (4.13)	0.243 (4.31)
$\ln inf_{it}$	0.482 (8.52)	0.506 (19.72)
$\Delta \ln varu_{it}$	0.014 (2.80)	0.014 (2.78)
$rest_{it}^*$	0.00002 (0.10)	0.000008 (0.04)
$\Delta \ln vat_{it}$	0.104 (3.07)	0.099 (2.99)
$\ln x_{it-1}^*$	- 0.702 (9.10)	
$\ln (x_{it-1}/u_{it})^*$		- 0.688 (9.48)
$\bar{R}^2$	0.995	0.995
SARGAN	$\chi^2(8) = 2.62$	$\chi^2(8) = 2.93$

IV estimates. A \* denotes that the variable is instrumented in estimation. t-ratios based on heteroskedasticity-consistent standard errors are given in parenthesis below the coefficients. The additional instruments used comprise:  $\ln omg_{it-1}$ ,  $\ln u25_{it-1}$ ,  $\ln inf_{it-1}$ ,  $\ln varu_{it-1}$ ,  $\ln u_{it-1}$ ,  $rest_{it-1}$ , and the current and one period lagged values of regional average earnings, the proportion of older workers amongst the unemployment stock, and regional house prices (all logged).

Sample: annual data 1984-94, 10 regions (n = 110).

Notes to Table 4

Each equation contains a full set of region and time dummies. SARGAN denotes Sargan's test of instrument validity. The test statistic has an asymptotic chi-squared distribution with degrees of freedom given in parenthesis.

See text and Data Appendix for variable definitions and data sources.

**Table 5. Outflows From Unemployment as a Percentage of the Beginning of Year Stock, 1984-94**

	(%)
South East	163.1
East Anglia	183.2
South West	171.1
East Midlands	154.2
West Midlands	132.6
Yorks. & Humbs.	149.4
North West	138.4
North	141.0
Wales	151.3
Scotland	147.5

Annual Average.

Sources: NOMIS and *Employment Gazette*

**Table 6. Breakdown of Regional Differences in the Average Rate of Unemployment Outflows Relative to the East Midlands.<sup>a</sup>**

	Actual Difference <sup>b</sup> (x/u) <sub>i</sub> - (x/u) <sub>EM</sub>	Predicted Difference <sup>b,c</sup>	<i>Due to:</i> <sup>d</sup>	<i>'Fixed Effect'</i>	<i>(h/u)</i>	<i>inf</i>	<i>img</i>
South East	8.9	9.5		3.8	3.2	7.1	-4.5
East Anglia	29.0	29.2		5.8	4.0	17.3	2.1
South West	16.9	17.8		2.0	3.0	11.3	1.4
West Midlands	-21.7	-22.8		-2.6	-2.9	-14.9	-2.4
Yorks & Humbs.	-4.8	-4.5		3.6	-2.4	-3.6	-2.0
North West	-15.8	-16.4		-2.8	0.7	-11.2	-3.1
North	-13.2	-13.2		1.6	-2.8	-9.6	-2.4
Wales	-2.9	-4.0		-0.5	0.8	-3.5	-0.8
Scotland	-6.7	-5.7		4.9	0.1	-5.2	-5.5

Notes

<sup>a</sup> Annual average rate of outflows from unemployment relative to beginning of year stock, 1984-94.

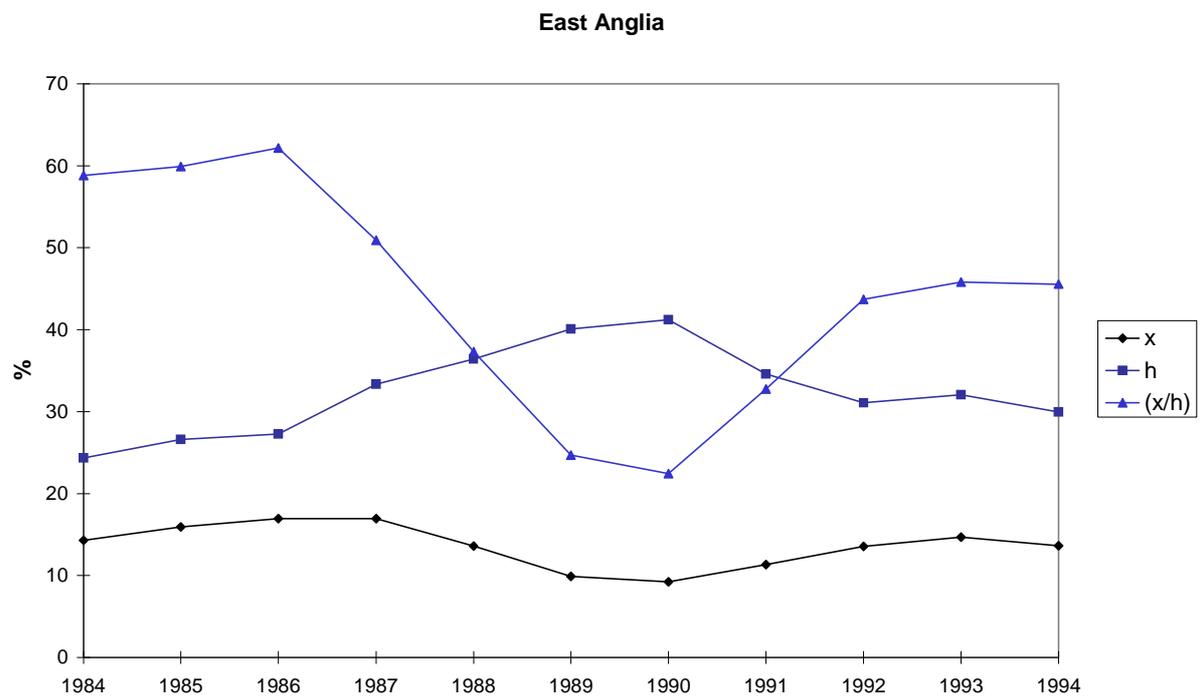
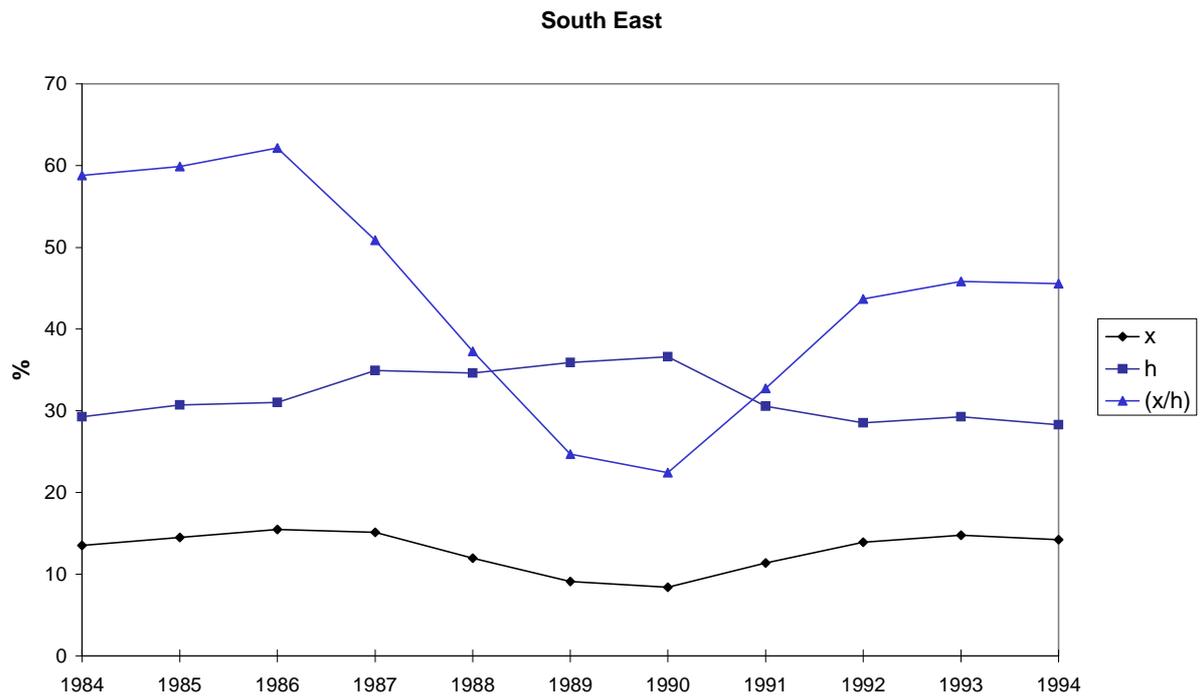
<sup>b</sup> Percentage points. See Table 5.

<sup>c</sup> Predicted difference based on equation (5).

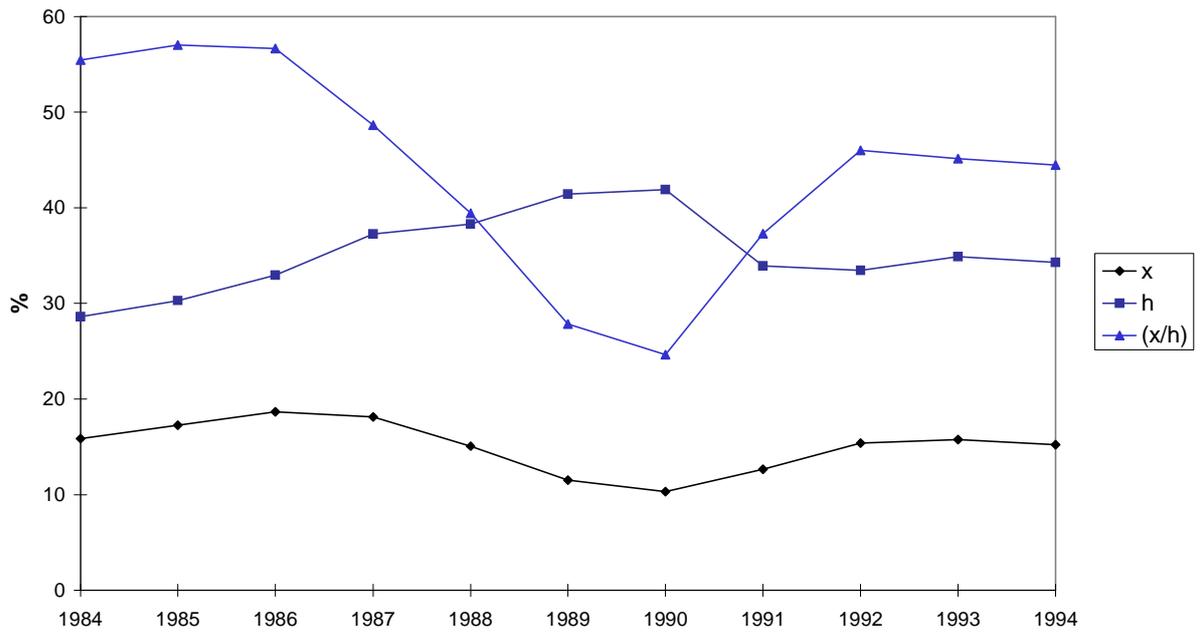
<sup>d</sup> "Predicted Difference" may differ from sum of components due to rounding.

See text for variable definitions

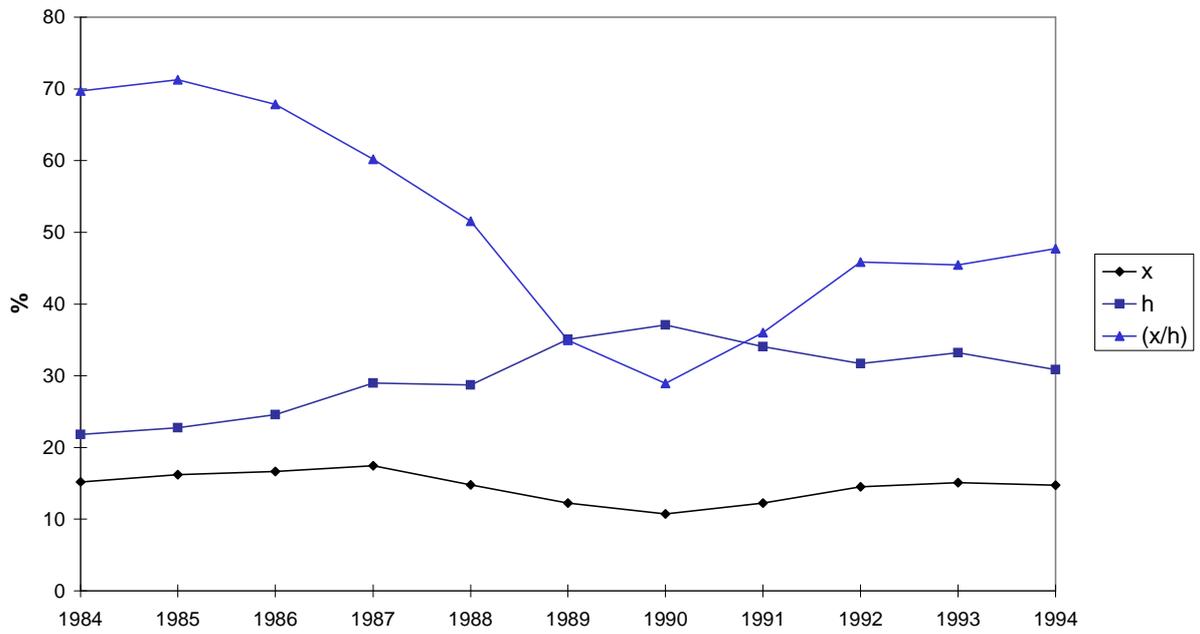
**Figure 1. The Rate of Outflows from Unemployment ( $x$ ), the Rate of New Hires ( $h$ ) and the Share of New Hires Captured by the Unemployed in the British Regions, 1984-94.**



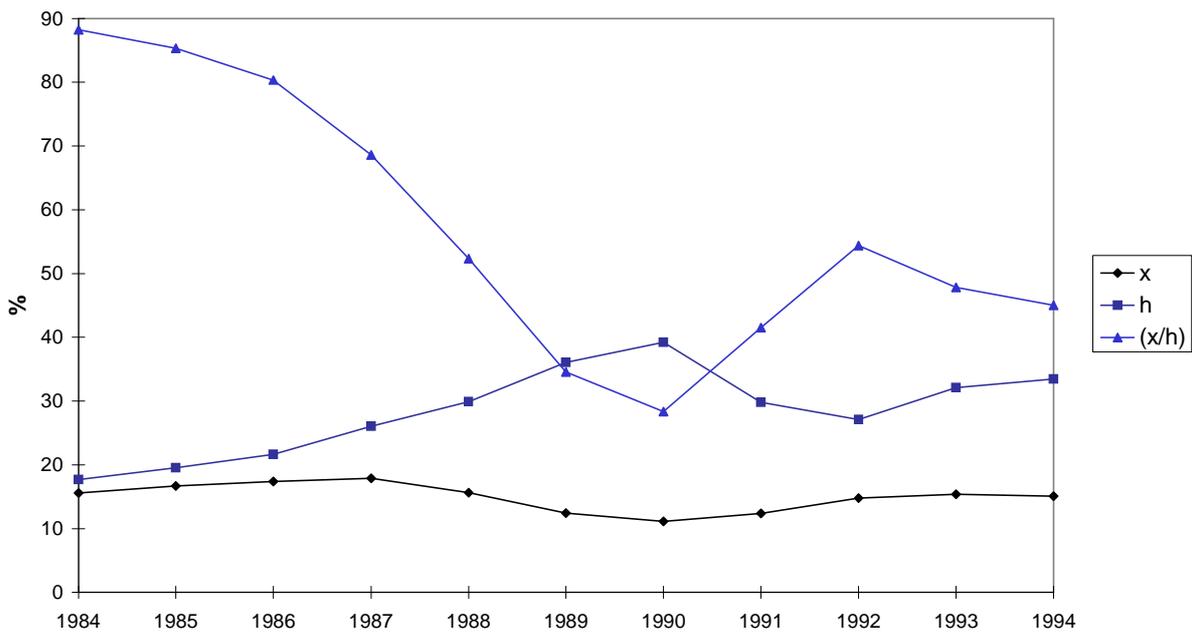
### South West



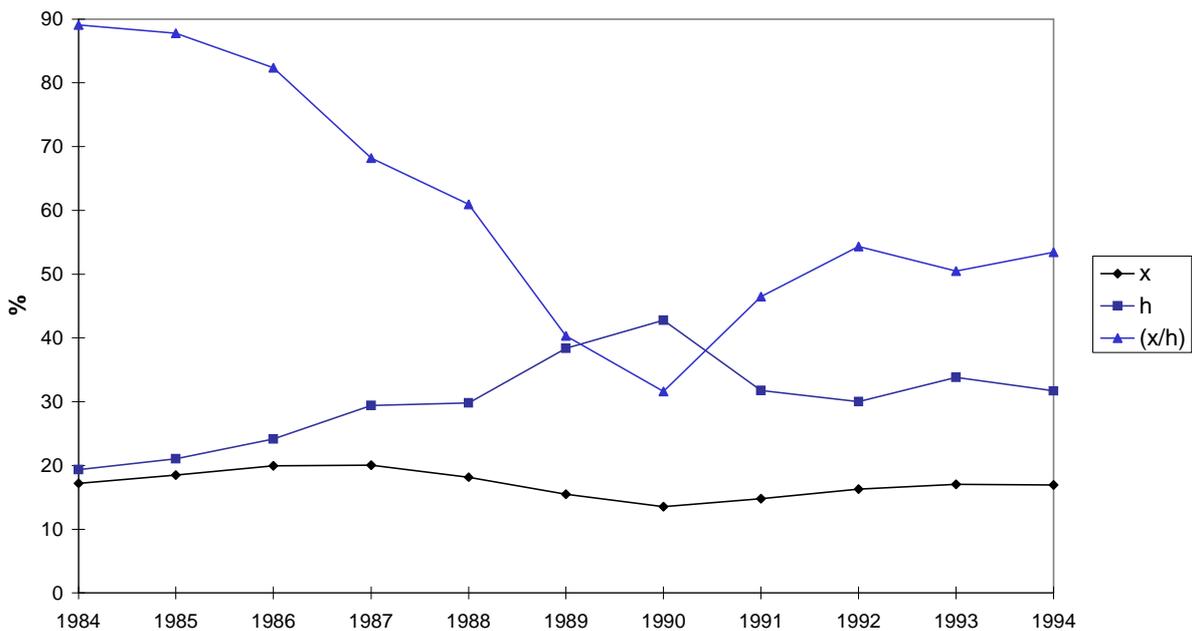
### East Midlands



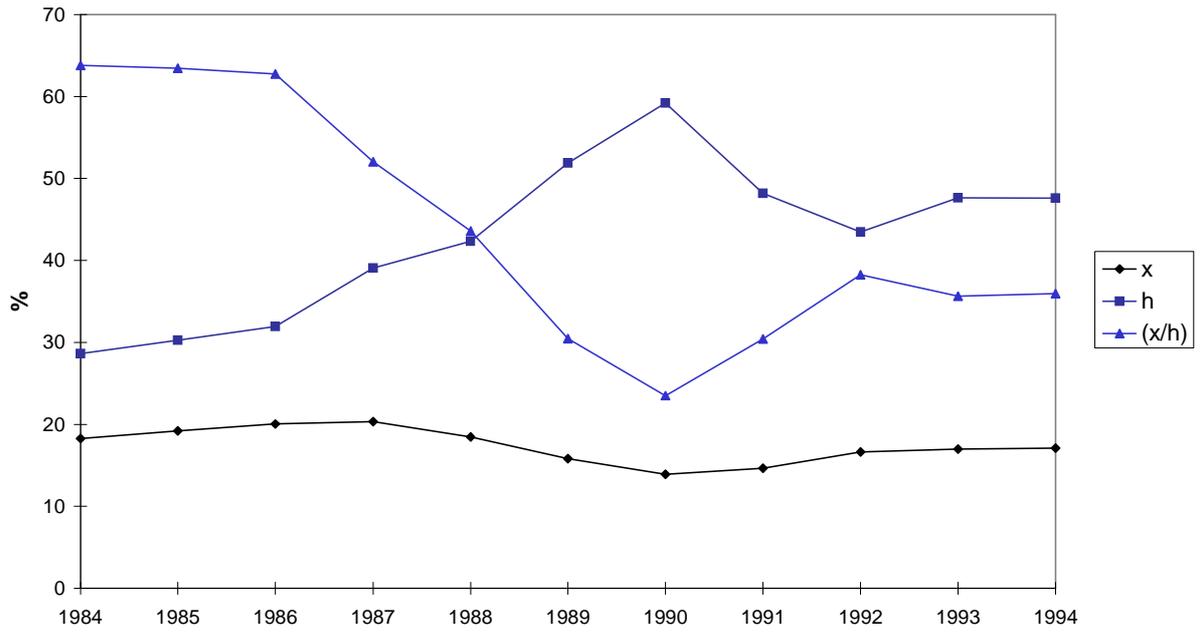
### West Midlands



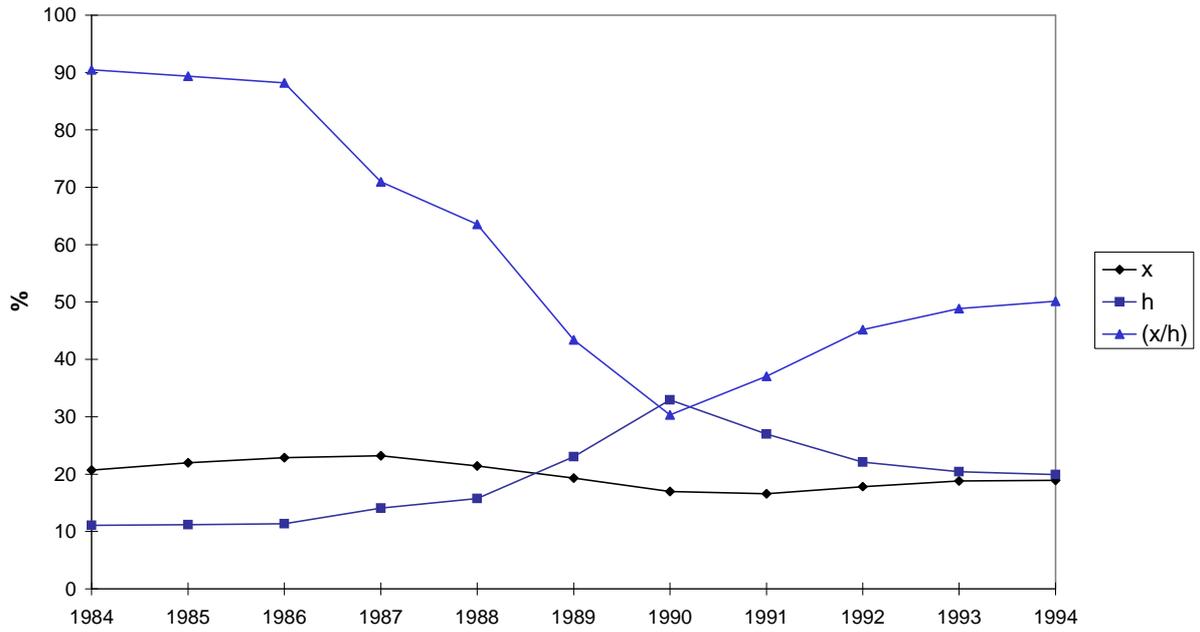
### Yorkshire & Humberside



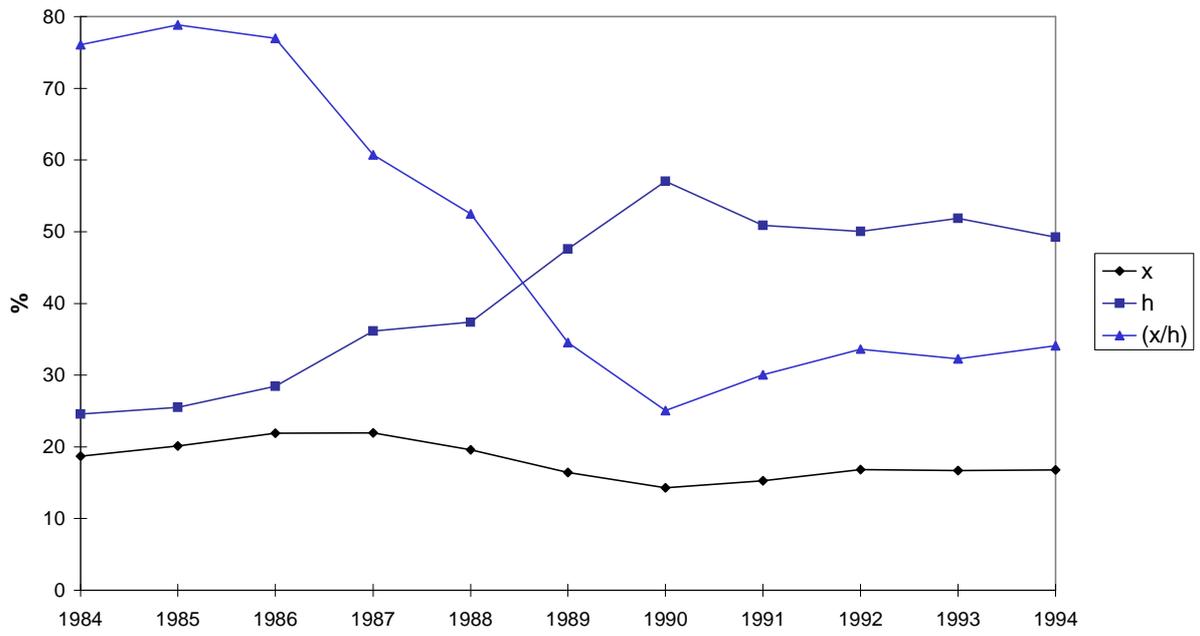
### North West



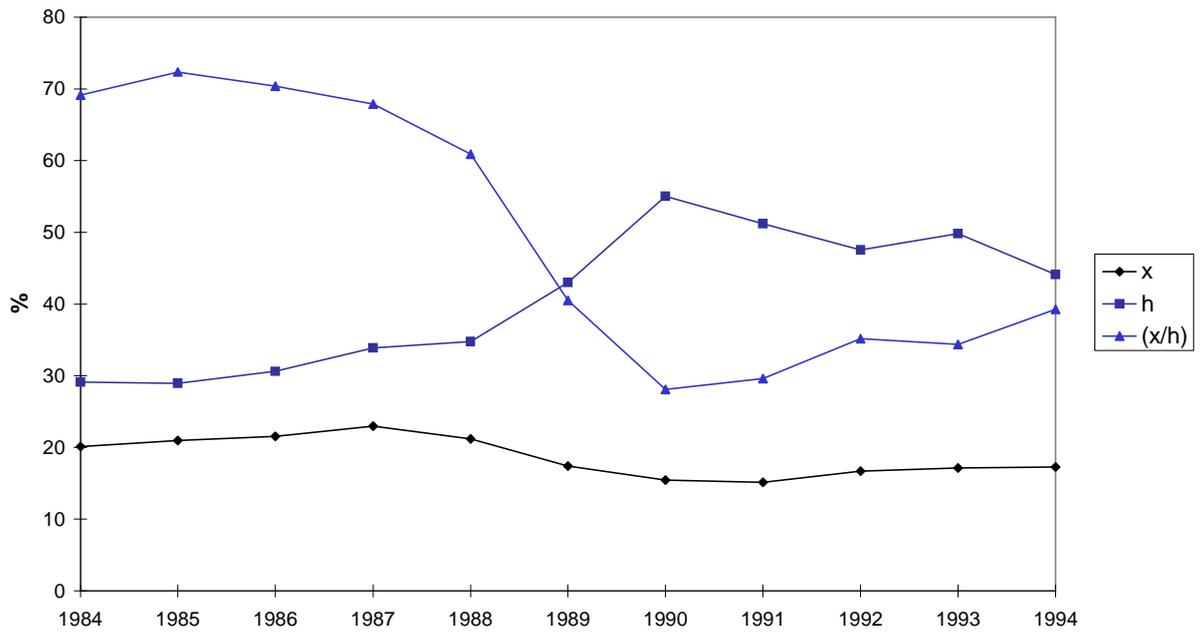
### North



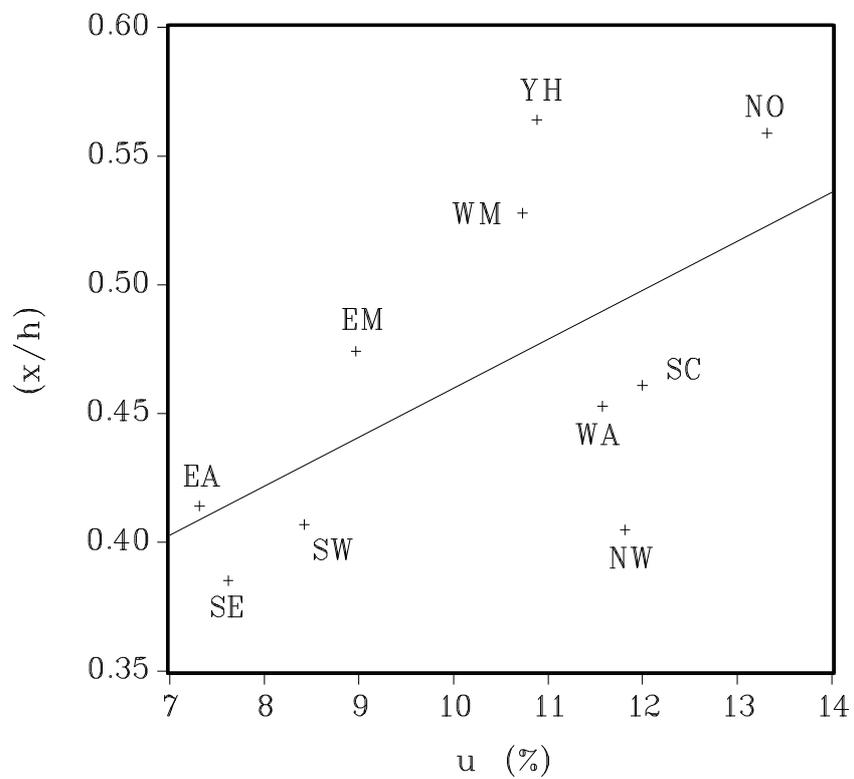
### Wales



### Scotland



**Figure 2. Regional Unemployment Rates and the Share of New Hires Captured by the Unemployed: Annual Averages, 1984-94.**



## Data Appendix

### *x - Outflows From Unemployment Relative to the Civilian Workforce*

For 1984-94, the outflow figures represent the number of persons ceasing to claim unemployment benefit in each year (computerised claims only). For 1983, we have figures on outflows from June to December only. The Civilian Workforce is measured at the beginning of the relevant period, so that for 1983 we use the June figure, whereas for all subsequent years the January figure is used. Data on unemployment outflows was obtained from the National On-line Manpower Information Service (NOMIS) at the University of Durham, whilst Civilian Workforce figures were obtained from various issues of the *Employment Gazette (EG)*.

### *h - (Adjusted) Vacancy Outflows Relative to the Civilian Workforce.*

As with the unemployment outflow data, for 1983 we use information on vacancy flows for June to December only. For all subsequent years the figures refer to total annual off-flows of vacancies at job-centres. The vacancy flow data are adjusted to allow for the fact that only a fraction of total vacancies are notified to job-centres, using the method used by Jackman, Layard and Pissarides (1989); i.e. we multiply the vacancy outflow figures for each region by the ratio of a measure of aggregate engagements based on Inland Revenue P45 data to the aggregate level of vacancy outflows. The source for the vacancy flow data is NOMIS. The Inland Revenue P45 data were supplied by Professor Stephen Nickell.

### *u - Unemployed as a Proportion of the Civilian Workforce*

We use the beginning of period stock of unemployed individuals, so that for 1983, the June figure is used, but for all subsequent years we use the figure from the January count. Source: *EG* (various issues).

### *imig, omig - Number of In and Out-migrants Relative to the Civilian Workforce*

The numerator in each case is the gross number of migrants based on National Health Service Central Register (NHCR) records, reported in various issues of *Population Trends*. Figures for 1983 are calculated as half the annual flow for that year.

### *w - Average Earnings*

Average weekly earnings (less overtime) of male full-time employees in April of each year. Source: New Earnings Survey data reported in *Regional Trends*.

### *u25 - Proportion of Unemployed Aged 25 or Under*

Beginning of period figures. Source: *EG*, various issues.

### *older - Proportion of Unemployed Aged 55 or Over (50 or over from 1989)*

Beginning of period figures. Source: *EG*, various issues.

### *ltu - Proportion of unemployed Out of Work for 52 Weeks or More*

Beginning of period figures. Source: *EG*, various issues.

*inf - Inflows into Unemployment Relative to Beginning of Period Stock*

The inflow figures represent the number of new claimants to unemployment benefit (computerised claims only) in each year. Source: NOMIS.

*varu - Variance of County Unemployment Rates*

Variance of the January (June in the case of 1983) unemployment rates (%) in the constituent counties of each region. Source: author's calculations based on data published in various issues of the *EG*.

*rest - Number of Restart Interviews Relative to the Number of Individuals Unemployed for at Least Six Months*

Restart data was supplied by Bob Anderton of the National Institute for Economic and Social Research. The original figures relate to Employment Service (ES) regions and fiscal, rather than calendar, years. ES regions differ from the standard regions used elsewhere in the analysis in that: (i) the East Midlands and East Anglia standard regions are combined to form an 'East Midlands and Eastern' ES region; and (ii) the ES regions allocate Cumbria to the 'North West', rather than the 'North' as in the standard regions. The number of Restart interviews in 'East Midlands and Eastern' region was therefore divided between East Midlands and East Anglia in proportion to each region's share of their combined total of individuals unemployed for at least six months. A similar device was used to estimate numbers of Restart interviews in Cumbria, which were then 'transferred' from the North West region to the North. Finally, the figures were adjusted to a calendar year basis by linear interpolation.

Beginning of period figures for the number of persons unemployed for at least six months were obtained from various issues of *EG*.

*vat - New Registrations for VAT Relative to the Civilian Workforce*

Figures for the annual number of new registrations for VAT in each region were obtained from *Business Briefing*, 23/10/92 and various issues of *Regional Trends*

*Regional House Prices*

Average Dwelling Price for Building Societies' Mortgage Advances. Source: *Housing and Construction Statistics*..

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