Housing Markets and Regional Unemployment Flows in Great Britain

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Abstract

Over the past 20 years, there has been a great deal of interest from academic economists and policy makers in the UK in the contribution of the housing market to regional disparities in unemployment. However, despite a considerable body of research, there remains a great deal of uncertainty concerning the role played by different features of the housing market in shaping the regional pattern of unemployment. In this study, we aim to gain a deeper understanding of this issue by examining the relationship between housing market variables and the flows into and out of regional unemployment. Our findings indicate that both the level of regional house prices and the housing tenure mix have significant effects on the rate of flows into and out of regional unemployment and hence upon the equilibrium rate of unemployment in a region. In particular, we find that regions with a relatively high level of house prices and/or a low proportion of social rented housing will tend to have a relatively low equilibrium rate of unemployment, other things equal.

JEL code: J43, R23, R58

1

1. Introduction

Over the past 20 years, there has been a great deal of interest from academic economists and policy makers in the UK in the contribution of the housing market to regional disparities in unemployment. Various features of the housing market have been investigated. Early research focused on the effects of local authority housing policies, which were seen as an impediment to labour mobility, restricting the incentives for workers to move between regions in response to regional unemployment differentials (Hughes and McCormick, 1981; Minford et al., 1988; Pissarides and Wadsworth, 1989). The boom in the owner-occupied housing market in the mid-to-late 1980s led to a change in emphasis, however. The emergence of significant regional house price differentials led to concerns over the creation of a 'North-South divide' within the economy and prompted a number of studies into the effect of these differentials on the pattern of inter-regional migration and the relationship between regional unemployment and vacancies (Bover et al., 1989; Hughes and McCormick, 1987; Muellbauer and Murphy, 1991; Jackman and Savouri, 1992).

In the recession of the early 1990s, the collapse of the owner-occupied housing market – which was most acute in the South East of England – was seen by some as a major influence on the regional pattern of unemployment growth, which appeared to differ from that observed in previous recessions (Bradley and Taylor, 1994; Evans and McCormick, 1994). Most recently, Oswald (1996) suggests that patterns of home ownership and the incidence of private sector renting have an important role to play in accounting for regional disparities in the rate of unemployment.[1]

Despite this considerable body of research, there remains a great deal of uncertainty concerning the role played by different features of the housing market in shaping the regional pattern of unemployment. The aim in this paper is to try to gain a deeper understanding of this

issue by examining the relationship between housing market factors and the pattern of flows into and out of regional unemployment. Previous work in this area has concentrated exclusively on the relationship between the housing market and the unemployment stock. By focusing instead on the analysis of unemployment flows, we aim to gain a better understanding of the ways in which housing market factors shape the development of regional disparities in unemployment.

There have in fact been relatively few studies of unemployment flows at the regional level. Martin and Sunley (1999) examine the extent to which variations in the pattern of flows into and out of unemployment can account for the disparities in British regional unemployment rates, but do not attempt to explain the regional variation in flow rates. Robson (2001) examines the extent to which regional disparities in unemployment outflows rates are due to differences in the rate of new hires or differences in the share of hires captured by the unemployed, and provides an empirical analysis of the factors that influence the latter. Elsewhere, van Ours (1995) uses regional level data to study the determinants of outflows from unemployment in the Netherlands, while Anderson and Burgess (2000) examine state-level data for the United States.[2]

The analysis of the present paper proceeds as follows. In section 2 we present a brief discussion of the data on regional unemployment flows followed by an outline of the data on regional house prices and housing tenure patterns. Section 3 considers the theoretical linkages between housing market factors and regional unemployment flows, while section 4 discusses the results of the empirical analysis. In section 5 we examine the implications for the

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[1] See Green and Hendershott (2001) for U.S. evidence on this issue.
[2] A number of papers have studied the determinants of spatial variations in outflows from unemployment at the sub-regional level (Bennet and Pinto, 1994; Coles and Smith, 1996; and Burgess and Profit, 2001), while Armstrong and Taylor (1985) present an analysis of spatial variations in the rate of inflows into unemployment in the North West of England.

relationship between housing market factors and equilibrium regional unemployment disparities. Finally, section 6 provides some concluding comments.

In brief, the results of the paper indicate that both the level of regional house prices and the housing tenure mix have a significant influence on the rate of flows into and out of regional unemployment and hence upon the equilibrium rate of unemployment in a region. In particular, we find that, other things equal, the equilibrium rate of unemployment will tend to be lower in regions with a relatively high level of regional house prices and/or a low proportion of social rented housing. In contrast to Oswald (1996) we find that a high rate of home ownership will tend to be associated with a low equilibrium rate of regional unemployment, other things equal.

2. Data Patterns and Trends

We analyse data on flows into and out of unemployment for the ten Standard Regions of Great Britain for the period 1984-95.[3] The data are based on flows of individuals into and out of the official monthly count of those claiming unemployment benefit, and are therefore subject to the same definitional changes and other discontinuities that afflicted the official count of the stock of unemployed over this period.[4] An additional complication is that the flow series relate to computerised claims only and therefore exclude a proportion of claimants - whose claims were processed clerically - who would have been included in the official figures for the stock of unemployment. The flow series therefore under-record the actual number of individuals moving into and out of unemployment. It is known that most of this under-recording occurred with respect to outflows, in that a significant number of the

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[3] The choice of period is restricted by considerations of data availability. 1984 is the first year for which a full year's published data on regional unemployment flows is available. After 1995 the change to the regional classification system in use in the UK, from Standard regions to Government Office regions, creates discontinuities in the published series for many of the explanatory variables used in the subsequent empirical analysis.

unemployed who ceased to claim were not officially classified as outflows from unemployment. In order to minimise the potentially distortionary impact of this problem on our analysis, we follow the procedure adopted by Junankar and Price (1984) in their study of aggregate unemployment flows and impute a series for outflows based on the series for inflows and regional unemployment stocks.

Table 1 shows figures for the average rate of outflows from unemployment in each region computed in this way for the period 1984-95, together with figures for the rate of inflows into unemployment and the average regional unemployment rate. Two measures of the rate of outflows from unemployment are shown. The first is the rate of outflows from unemployment relative to the regional workforce, while the second is the rate of outflows relative to the level of unemployment at the beginning of the year. The figures in Table 1 show that there are considerable disparities in the rates of regional unemployment flows. For instance, the average rate of inflows into unemployment in the North of England - the region with the highest inflow rate - is 1.6 times that in the region with the lowest rate, the South East. The rate of outflows from unemployment as a proportion of the workforce - which is strongly correlated with the inflow rate - exhibits a similar pattern of regional disparities. Finally, the average rate of outflows relative to the beginning of year level of unemployment ranges from a high of 193.1% in East Anglia to a low of 142.9% in the West Midlands: a factor of 1.4. [5]

For comparison, Table 2 and Figure 1 provide information on regional housing market characteristics. Table 2 gives information on the pattern of housing tenure across regions, while Figure 1 shows figures for average regional house prices in 1984 and 1995.

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[4] These definitional changes and discontinuities are chronicled in the Appendix to Martin and Sunley (1997).
[5] For a more detailed discussion of the data on regional unemployment flows in Great Britain, see Martin and Sunley (1999).

From the housing tenure figures, Scotland – in particular - and the North of England stand out as having relatively a low proportion of home ownership and a relatively large social rented sector (comprising local authority rented accommodation and accommodation rented through Housing Associations). By contrast, the South West has a relatively high proportion of owner-occupied housing and a relatively small social rented sector. The private rented sector is generally quite small and only in the southern-most regions – the South East, East Anglia and the South West – does it account for more than 10 percent of the dwelling stock.

Figure 1 shows the familiar pattern of regional house price differentials, with house prices generally highest in the southern-most regions of Great Britain and lowest in the north. Although there are some relatively minor movements, the pattern of regional house price differentials is generally quite stable over time. For example, the correlation coefficient between the figures for the two years shown, 1984 and 1995, is + 0.94.

The following sections of the paper investigate the extent to which the observed regional disparities in unemployment flows may be accounted for by these differences in regional housing market characteristics.

3. Housing Markets and Regional Unemployment Flows: Theoretical Considerations

3.1 *Inflows*

The analysis of inflows is based on a similar framework to that employed by Burgess (1992) to examine the determinants of the rate of inflows into unemployment at the aggregate level. The inflow rate into unemployment as a proportion of the beginning of period number of individuals in employment, i, equals the rate of quits into unemployment, q^u, plus a second component which is a function of the layoff rate, l; i.e.

$$i = q^u + \phi(l) \qquad\qquad \phi(l) \le l \qquad \forall\, l \qquad\qquad (1)$$

The function ϕ captures the notion that only a fraction of workers laid-off in region i may end up in unemployment. Some may migrate to take up employment in other regions, while others may simply leave the workforce. The layoff rate itself is given by the planned rate of reduction in employment by firms experiencing negative shocks, *npr*, minus the expected rate of quits, q^e; i.e. $l = npr - q^e$

The expected rate of quits provides an avenue through which housing market variables may be expected to influence the inflow rate into unemployment. The avoidance of commuting costs means that the process of moving between jobs often entails moving accommodation. The evidence for this is somewhat indirect, but Boheim and Taylor (1999) using data from the British Household Panel Study report that amongst households who cite "job related reasons" as reasons for moving house (around 14% of movers) over one third of moves tend to be associated with quits.[6] Significant transaction costs are typically incurred in the process of buying a house - in the form of lawyers' and surveyors' fees, for example. In addition it is usual for buyers to be required to make an initial down payment of some proportion of the selling price. The process of moving house will therefore tend to be easier for those high-value housing assets, who may be able to withdraw some of their housing equity in order to finance the costs of moving.[7] This suggests that a positive relationship may be expected between the quit rate and the level of regional house prices. Some empirical support for this may be found in the evidence produced by Henley (1998) who finds that, for men at least, the probability that an individual quits his job is positively related to the rate of regional house price inflation. On this basis we might therefore expect to observe a negative relationship between regional house prices and the rate of inflows into unemployment.

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[6] This includes individuals moving between employers and those who leave to start their own business. See Table 9 of Boheim and Taylor (1999).

Housing tenure may also be expected to influence the willingness of workers to move between jobs. Homeowners - as well as house buyers - must typically incur costs in moving home. An owner-occupier faced with the choice between staying in his or her current job and moving to take up a job offer elsewhere must therefore include the costs of moving when weighing up the relative returns from the two options. For an individual in rented accommodation, however, the decision whether or not to move will be based solely on an assessment of the relative earnings from the two jobs. For any given level of the wage differential therefore, the probability of movement will be greater for a renter rather than an owner-occupier. [8] On this basis we might therefore expect to observe a negative relationship between the rate of owner-occupation in a region and the level of quits. Conversely, where no house move is required, the security conferred by the value of their housing assets may mean that homeowners are more willing than renters to take on the risks associated with job movement. The evidence on these issues is a little mixed. Boheim and Taylor (1999) show that the probability that an individual changes his or her employment status in a given year is highest for private renters and lowest for those who own their home outright (as distinct from mortgage holders), but this includes all labour market transitions rather than just job to job moves. In contrast, in his econometric analysis Henley (1998) finds no evidence of a relationship between an individual's housing tenure and the propensity to quit.

The other variables that we expect to influence the quit rate are the proportion of young workers in the workforce, *yth*, the beginning of period rate of unemployment, and the vacancy rate. The rate of unemployment (vacancies) is expected to have a negative (positive) effect on the expected rate of quits and hence, a positive (negative) effect on the rate of inflows into unemployment. The effect of *yth* on the inflow rate into unemployment is

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[7] The influence of down payment requirements on house prices and housing market dynamics is studied by Stein (1995).

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ambiguous a priori, as the negative effect that is expected to work through this channel may be offset by a positive direct effect on q^u.

3.2 Outflows

The framework for the analysis of regional unemployment outflows is that used by Robson (2001), which is itself a variant of the 'job competition' framework employed by Burgess (1993) and more recently by Broersma (1997) to study the determinants of the rate of outflows from unemployment at the aggregate level.[9] We hypothesise that relative to the regional labour force, the rate of outflows from unemployment in region i at time t (i.e. x_{it}) is given by:

$$x_{it} = \lambda_{it}(h/j)_{it}u_{it} \tag{2}$$

where h_{it} denotes the rate of new hires, u_{it} denotes the rate of unemployment, and j_{it} denotes the number of individuals seeking jobs in the region - each again defined relative to the regional labour force. Finally, λ_{it} measures the relative success of the unemployed in attracting job offers. This final term captures the notion that the unemployed must typically compete with other job seekers in the market for new hires in a region. These may comprise job movers amongst the region's employed workforce, as well as migrants from outside the region. The number of those competing with the unemployed in the market for jobs will not be constant but instead may be expected to vary with the state of the labour market. In particular, the intensity of on-the-job search amongst workers in employment may be expected to increase with increases in the rate of new hires in the region.

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[8] This issue and its implications are examined further in Oswald (1997) and Haavio and Kauppi (2001).
[9] A similar approach is also used by Anderson and Burgess (2000), in their analysis of outflows from unemployment at the state-level in the USA.

What is the potential role for housing market factors within this framework? First, we note that there is a potential demand-side effect, though this may be of relatively minor significance. A high level of regional house prices will tend to raise the wealth of owner-occupiers and lead *inter alia* to relatively high levels of expenditure on locally produced non-tradable goods and services (Evans and McCormick, 1994).[10] This in turn may be expected to lead to high levels of labour demand in the regional economy, which we would expect to be reflected in a relatively high regional rate of new hires, h_{it}. In the empirical analysis, we take this hiring rate as given and focus our attention on the influence of the housing market on the supply side of the labour market.

Equation (2) suggests two supply-side channels through which housing market variables may be expected to impact on the rate of outflows from unemployment. The first is by influencing the number of competitors to the unemployed in the market for new hires. For example, as noted above, housing tenure may be expected to influence the willingness of employed workers to move jobs. In addition, the housing tenure mix of a region may affect the attractiveness of the region to in-migrants (Jackman and Savouri, 1992, present some evidence on this). Evidence certainly suggests a role for regional house prices in this context. For example, Jackman and Savouri (1992) find that a high level of regional house prices is a significant deterrent to regional in-migration.

The second supply-side channel through which housing market factors may impact upon the rate of outflows from unemployment is by influencing the competitiveness of the unemployed in the market for jobs (i.e. by influencing the value of λ_{it}). The success of the unemployed in capturing a share of new hires in a region may be dependent on their

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[10] In support of this, Carruth and Henley (1993) find a significantly positive effect of housing wealth on consumer spending in a number of UK regions. Furthermore, Maclennan and Tu (1998) find that during the period 1989-93 individuals who perceived that falling house prices had reduced the value of their wealth were more likely than others to have reduced their expenditure on consumption of non-necessities, including locally produced non-tradables such as entertainment and eating out.

willingness to move within the region to look for work or take up the offer of a job. The extent of such intra-regional mobility is likely to depend on the characteristics of the regional housing market. In addition to this, it is likely that regional house price differentials may reflect more general regional differentials in the cost of living. With unemployment benefit scales determined at the national level, regional house price differentials may therefore be associated with inter-regional variations in the incentives for unemployed workers to search intensively for jobs. Higher levels of job search intensity may enable the unemployed in regions with relatively high house prices to capture a greater proportion of new hires.

4. Empirical Analysis

We investigate the relationship between regional housing market characteristics and regional unemployment flows by estimating a series of pooled regressions on annual data for the rate of flows into and out of unemployment in the 10 Standard Regions of Great Britain for the years 1984-95.[11]

4.1 Inflows

In the analysis of the rate of inflows into unemployment, we model *npr* as a function of regional average earnings and the growth of regional per capita GDP, plus a set of variables reflecting the industry composition of regional GDP and the occupational and skill composition of regional employment. The variables included are the proportion of employment in manufacturing, the proportion of professional and managerial employees, and the percentage of the regional workforce with a degree or equivalent qualification. Finally, we treat ϕ as a function of the proportion of females in regional employment, and the regional rate of out-migration. Because women tend to have a lower attachment to the labour force than

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[11] The relatively short time-series dimension of the data precludes the use of panel integration tests such as those of Im et al (1997) to test for the presence of unit roots in the data.

men, we expect a high proportion of females in the workforce to be associated with a relatively low value of ϕ and hence a relatively low rate of inflows into unemployment, other things equal. A high rate of out-migration should also tend to reduce the rate of inflows into unemployment within the region.

We estimate an initial equation that includes current and lagged values of the explanatory variables as well as a lagged dependent variable to allow for adjustment of the inflow rate to changes in the values of its determinants. Time dummies are included to capture the effect of aggregate influences on the rates of quits and layoffs. Finally, we include a set of region dummies to capture any otherwise unspecified persistent regional disparities in the rate of inflows into unemployment. Estimation is by Instrumental Variables (IV) in order to allow for the potential endogeneity of the current level of regional house prices and the rate of out-migration. Column (1) of Table 3 shows the results that emerge following the deletion of a number of insignificant terms. Anderson-Hsiao estimates of this equation are presented in column (2) in recognition of the biases that may be introduced by the presence of the lagged dependent variable (Nickell, 1981).[12]

There are some discrepancies between the two sets of results but on the whole the signs of the coefficients are broadly in line with expectations. The effect found for the proportion of professional and managerial employees is clearly an exception, however, and the positive short-run effect from the rate of out-migration is not easily explained.[13] The results lend some support to Burgess's findings based on aggregate data, that a high beginning of period unemployment rate tends to raise the rate of inflows into unemployment, while a high

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[12] The biases are predicted to be of order $1/T$, where T is the number of time periods used in the regression analysis, and may be expected to affect the estimate of the coefficients for $\ln u_{it}$, as well as that for the lagged dependent variable. Each of these variables is therefore instrumented in the regression reported in column (2). Note that the first-differencing required in the implementation of the Anderson-Hsiao procedure reduces the number of available observations for this regression to 110.

vacancy rate tends to reduce it (Burgess, 1992). The explanation for this is that a relatively high ratio of unemployment to vacancies discourages quits, so that a higher proportion of the effects of negative shocks to employment has to be absorbed by layoffs. The results suggest, however, that at the regional level these effects may be confined to the short-run.

Turning to the housing market variables that are the main concern of the paper, the results in column (1) show a statistically significant negative effect of regional house prices on unemployment inflows. The effect is less well determined in the estimates reported in column (2) but is of a similar order of magnitude. In contrast, the estimates in column (1) suggest that regional variations in the pattern of housing tenure have no statistically significant impact on the rate of inflows into unemployment. In column (2), however, the coefficient for the proportion of owner-occupation is on the borderline of significance. The negative coefficient suggests that a higher rate of home-ownership is associated with a lower rate of inflows into unemployment, other things equal.

A natural concern with these results is that the coefficient for regional house prices may simply be picking up the effects of regional variations in the level of aggregate demand. However, the inclusion of terms in the rate of growth of regional per capita GDP in these equations makes this unlikely. Instead, the finding that the rate of inflows into unemployment is negatively related to the level of regional house prices is consistent with the arguments advanced in the previous section concerning the role of house prices in facilitating housing and job mobility. A high level of regional house prices encourages a relatively high rate of voluntary job separations and means that firms are less likely to have to resort to involuntary layoffs in the event of a negative shock to regional employment.

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[13] The most likely explanation for these 'perverse' results is that the variables are picking up the effects of a relevant explanatory variable that has inadvertently been omitted from the regressions. In particular, they may be picking up the effects of unmeasured heterogeneity in the regional workforce.

4.1 Outflows

The specification of the regression equation for the rate of outflows is based on the set of explanatory variables identified in Robson (2001) as potential influences on the rate of outflows from regional unemployment, supplemented with the regional house price and housing tenure variables discussed previously.

Within the context of equation (2), the key explanatory variables for the rate of outflows from unemployment in a region are the rate of new hires in the region and the (beginning of period) unemployment rate. As a proxy for the former we use figures for the outflow of vacancies notified to job-centres within the region. The rate of regional unemployment may be expected to influence the rate of outflows from unemployment both directly and indirectly - the latter due to its effect in reducing the number of employed workers engaging in on-the-job search.

As noted above, the number of workers competing for new hires within a region will include a number of in-migrants from outside. In contrast, we need also to take account of the fact that a proportion of the region's workforce will migrate from the region to take up jobs elsewhere. In keeping with Robson (2001), we model these effects by including the rate of in-migration and out-migration directly in our equation for unemployment outflows - making due allowance for the possibility that these variables may themselves be dependent on the outflow rate.

Following the discussion of theoretical issues in section 3, the effect of regional house prices and housing tenure patterns may be expected to operate through the final term in equation (2), λ_{it}, which measures the relative success of the unemployed in the market for new hires. In addition, Robson (2001) suggests that this may depend, *inter alia,* on the following variables: the proportion of the unemployed aged under 25 (*u25*); the proportion of older workers amongst the unemployed (*older*); the proportion of long-term unemployed in the

unemployment stock (*ltu*); the number of inflows into unemployment relative to the beginning of period stock of unemployment (*infl*); the variance of unemployment rates between the constituent counties of the region (*varu*); the level of average earnings (*w*); and finally, the rate of new business formation, proxied by the rate of new registrations for VAT (*vat*). Briefly, the explanation for the inclusion of these variables is as follows. Firstly, young unemployed workers may be expected to be relatively active searchers in the market for jobs and relatively effective in competition with employed job seekers. For older unemployed workers, however, the converse is likely to be true. In the case of the long-term unemployed, there are a number of factors that may limit their effectiveness as competitors in the market for new hires, including a low intensity of job search activity and the possibility that employers may use unemployment duration as a screening device to sort applicants for vacancies (Blanchard and Diamond, 1994). The very short-term unemployed – i.e. the those in the current inflow – will tend not to experience these disadvantages and in addition may enjoy the benefit of being able to select from a bigger pool of job vacancies (Coles, 1994; Coles and Smith, 1995; Gregg and Petrongolo, 1997). A high rate of inflows relative to the beginning of period stock of unemployment may therefore be expected to have a positive effect on the rate of outflows.

The variance of within-region county unemployment rates is included in an attempt to capture the effects of intra-regional spatial mismatch between unemployment and vacancies. To the extent that a greater variance of county unemployment rates is associated with greater intra-regional mismatch, a negative relationship between *varu* and λ_{it} may be expected.[14] Higher levels of regional average earnings raise the returns from working relative to those from remaining unemployed and so may be expected to raise the competitiveness of the

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[14] Whether a higher value of *varu* is indeed associated with greater mismatch depends on the distribution of vacancies within a region. Unfortunately, we do not have data on county-level vacancy rates for this study.

unemployed in the market for new hires. Finally, jobs created by newly established firms may be relatively unattractive to those already in employment (e.g. because the relatively high failure rate of new firms means that the expected duration of such jobs will tend to be relatively short) and hence a larger share of these jobs may be captured by unemployed job seekers. As such, a positive relationship between the regional rate of new business formation and λ_{it} may be expected.

In addition to the above, the rate of in-migration and out-migration may have an effect on λ_{it} by changing the composition of the region's unemployed. In general, one might reasonably expect that it will be the most active searchers in the job market who are most likely to migrate between regions. A high rate of in-migration into the region's unemployment stock will therefore tend to raise the value of λ_{it}, while a high rate of out-migration is likely to reduce it. Finally, as in the analysis of inflows, we include time dummies and regional fixed effects in our estimating equations. The time dummies capture the effect of aggregate influences on the incentives for individuals to engage in on-the-job search and on the intensity of job search amongst unemployed workers. The regional fixed effects capture 'permanent' features of regions that may influence the relative success of the region's unemployed in the market for new hires, such as for example, the density of the regional job-centre network.[15]

Following the deletion of a number of insignificant terms, we arrive at the specification shown in column (1) of Table 4. Setting aside the housing market variables for a moment, the results for the other variables are broadly in line with those reported in Robson (2001). The main difference is that in this study we find no role for a lagged dependent variable in the equation.[16] Turning to the housing market variables, the results again show a

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[15] Robson (2001) also includes a measure of the effects of the Restart programme but this is found to be statistically insignificant and is therefore omitted from the present study.

[16] We use the Anderson-Hsiao method to estimate an equation with the lagged dependent variable included but the coefficient of this variable is found to be statistically insignificant (t = 1.20). Given the highly autoregressive

statistically significant effect from the level of regional house prices. The positive coefficient is consistent with the theoretical arguments discussed in the previous section and suggests that other things equal a higher level of regional house prices leads to a higher rate of outflows from regional unemployment. The results for the housing tenure variables suggest that other things equal, the rate of outflows from unemployment is higher in regions characterised by a relatively high rate of private sector renting. In contrast, the coefficient for the proportion of owner-occupation is only on the margins of statistical significance but in fact one cannot reject the null hypothesis that the coefficients for owner-occupation and private sector renting are the same ($\chi^2(1) = 0.004$).

Column (2) of Table 4 reports estimates that result when this restriction is imposed together with a second restriction suggested by the estimates in column (1); namely that the coefficient for ln u_{it} is equal to unity. The dependent variable in this equation is therefore the rate of outflows from unemployment relative to the beginning of period unemployment stock. The results suggest that as far as the effect of housing tenure is concerned the important distinction is that between the private sector (owner-occupation plus private renting) and the social rented sector. In particular, it appears that other things equal, the rate of outflows from unemployment is lowest in regions characterised by a large social rented sector. Following the discussion in the previous section, the most plausible explanation for this finding is that it reflects a low rate of labour mobility amongst local authority tenants.[17]

As with the analysis of inflows, there is a natural concern that the effects that we have attributed to housing market factors, in particular those attributed to house prices, may simply

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nature of movements in the unemployment stock, the exclusion of this variable may be seen as somewhat surprising. The presence of a lagged dependent variable in the inflows equation, however, suggests that movements in the inflow rate may be the source of persistence in the unemployment stock. See Burgess and Turon (2000) for further evidence on this issue using aggregate data.

[17] The findings are consistent with microeconometric evidence reported by Boheim and Taylor (2000). They find that amongst unemployed men, the exit rate from unemployment into full-time work is lowest for individuals who were local authority tenants at the time of the start of their unemployment spell.

reflect the effect of regional differences in the level of aggregate demand. In the regressions reported in Table 4, we would expect any such demand effects to be captured by the terms in the rate of new hires. However, to try to further dispel the notion that the housing market variables are simply picking up the effects of regional variations in the level of aggregate demand, we re-ran the regression reported in column (1) of Table 4 with terms in the current and one-period lagged growth in regional per capita GDP included. The results did not reject the hypothesis that these variables can be excluded from the equation ($\chi^2(2) = 1.77$).[18]

5. Housing Markets and Regional Unemployment Disparities

The results from the previous section can help us to gain an insight into the processes through which housing market factors may have contributed to regional unemployment disparities in Great Britain. Let i_{it} denote the rate of inflows into unemployment in region i, and f_{it} the rate of outflows relative to the unemployment stock. Then in equilibrium with the level of inflows into unemployment equal to the level of outflows we have (dropping the i and t subscripts for convenience):

$$\ln i + \ln N = \ln f + \ln U \tag{3}$$

where N denotes the level of employment and U is the level of unemployment. Rearranging (3) we obtain

$$\ln (U/N) = \ln i - \ln f \tag{4}$$

i.e. in equilibrium, the natural logarithm of the ratio of unemployment to employment is equal to the difference between the natural logarithms of the inflow rate and the outflow rate. Note that the latter may be written as:

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[18] An additional concern is that the housing market variables may be capturing the effects of regional differences in the skill level of the workforce. However, for this to be a plausible explanation we would require a tendency for the skill levels of unemployed workers relative to those of the employed workforce to be higher in areas characterised by high regional house prices and/or a low rate of social renting. A priori there seems little reason to believe that this is likely to be the case.

$$\ln i - \ln f = (1 - \alpha)\boldsymbol{\beta_1}\mathbf{Z_1} - \alpha \ln N + \alpha \ln U - \boldsymbol{\beta_2}\mathbf{Z_2} \tag{5}$$

where $\mathbf{Z_1}$ denotes the determinants of the inflow rate and $\boldsymbol{\beta_1}$ the associated parameter vector, α is the coefficient for the level of inflows relative to the beginning of period stock of unemployment in the outflows equation, and $\boldsymbol{\beta_2}\mathbf{Z_2}$ captures the effect on the outflow rate of all other variables apart from the level of inflows. Substituting (5) in (4) we therefore obtain:

$$\ln (U/N) = \boldsymbol{\beta_1}\mathbf{Z_1} - (\boldsymbol{\beta_2}\mathbf{Z_2}/(1 - \alpha)) \tag{6}$$

Equation (6), in tandem with the results from Table 3 and Table 4, may be used to gauge the effects of housing market factors on equilibrium regional unemployment. Consider first the effect of regional differences in the housing tenure mix. From the results in tables 3 and 4, we see that a region with a relatively high rate of owner-occupation and a relatively low rate of social renting (call this region A) will tend to have both a lower rate of inflows into and a higher rate of outflows from unemployment, other things equal, than a region with the converse housing tenure mix (region B). The net effect therefore, is that other things equal, region A will have a lower equilibrium unemployment rate than region B. Using the estimates from column (2) of Table 3 together with those from column (2) of Table 4, gives a long-run elasticity with respect to the proportion of owner-occupied housing of –0.86. In other words, a 10 percent difference in the proportion of owner-occupied housing between regions (relative to the proportion of social rented dwellings)[19] is associated in the long-run with an 8.6 percent difference in the ratio of unemployment to employment.

Similar effects are observed for house prices. A higher level of regional house prices leads to a lower rate of inflows into unemployment and a higher rate of outflows. The estimated long-run elasticity of the ratio of regional unemployment to employment with respect to regional house prices is –0.52. This direct supply-side effect on regional unemployment differentials will be reinforced if a higher level of regional house prices leads -

perhaps via an increase in demand for locally produced non-traded goods and services - to a higher rate of new hires in the region. The latter will tend to raise the rate of outflows from regional unemployment and thus further reduce the equilibrium unemployment rate relative to that in a region in which house prices are lower.[20]

6. Conclusions

By studying the effect of housing market variables on the flows into and out of regional unemployment, we have gained an insight into the contribution of the housing market to regional unemployment disparities in Great Britain. Both the price of owner-occupied housing and the regional housing tenure mix are found to significantly influence the rate of flows into and out of regional unemployment. In the case of house prices, the combined effect on the two flow rates implies that, other things equal, the equilibrium rate of unemployment will tend to be lower in regions with a relatively high level of regional house prices.[21] The results of the paper therefore provide support for the view that regional house price differentials are a significant source of regional unemployment disparities. However, in contrast to previous studies in which the transmission mechanism from regional house price differentials to regional unemployment disparities is seen to operate through the effects of house price differentials on inter-regional migration flows, the present analysis has identified more direct effects that operate through the flows into and out of regional unemployment. These effects are independent of the rate of inter-regional migration.

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[19] i.e. a difference of approximately 6 percentage points, based on the figures reported in Table 2.

[20] Additional effects of both regional house prices and housing tenure mix may operate in the short-run through the terms in the rate of growth of regional in- and out-migration that appear in the inflow and outflow rate equations. However, we assume that in equilibrium these terms are equal to zero. For evidence on the effects of house prices on regional migration flows see Jackman and Savouri (1992), Cameron and Muellbauer (1998) and Gordon and Molho (1998). These studies also include evidence on housing tenure effects, as do *inter alia* Hughes and McCormick (1987), Pissarides and Wadsworth (1989) and Boheim and Taylor (1999).

In the case of housing tenure, the evidence of the paper is at odds with the argument put forward by Oswald (1996): that high rates of home-ownership will tend to lead to a higher equilibrium rate of unemployment.[22] Instead, the results are supportive of an earlier literature (e.g. Hughes and McCormick, 1981; Minford et al., 1988) that emphasises the role of the social rented sector in creating impediments to labour mobility and thus leading to higher levels of unemployment.

It is important to emphasise that in the equations we have estimated the housing market variables do not seem simply to be proxying for the effects of regional differentials in the level of demand for goods and services. In the analysis of unemployment inflows we would expect such effects to be captured by the inclusion of terms in the rate of growth of regional per capita GDP. In the case of outflows, the rate of new hires may be expected to perform a similar role, though in addition we have tested for the inclusion of terms in the rate of growth of regional per capita GDP and found these to be insignificant. Instead, the suggested interpretation of the housing market effects that we have identified is that – primarily - they reflect supply-side pressures on (intra-regional) labour mobility and the competitiveness of unemployed job seekers in the market for new hires.

The results of the paper help us to understand the role of housing market factors in helping to lead to the unexpected compression of regional unemployment disparities in the recession of the early 1990s. The sharp downturn in the housing market in the South East of England, which resulted in a decline in regional house prices of over 7%, contributed to a steep rise in the rate of inflows into unemployment in the region by making it more difficult

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[21] This contrasts with the results from a recent paper by Cameron and Muellbauer (2001), which finds that high relative regional house prices lead in the long-run to a higher relative regional unemployment rate, other things equal.
[22] Interestingly, the results of the present paper are not inconsistent with the empirical evidence presented by Oswald for the case of the UK regions. In contrast to the analysis presented elsewhere in Oswald's paper, in the case of the UK regions he reports of the results of regressions of the unemployment rate on the proportion of

for firms to reduce their employment levels without recourse to layoffs. The rate of outflows from unemployment will also have been reduced. The net effect therefore was a steep rise in the regional rate of unemployment. In contrast, in the more traditional high unemployment regions such as the North and Scotland, the disturbance to the housing market, and hence the effect on the flows into and out of unemployment, was much less severe.

From a policy perspective it is worth noting that the analysis highlights an interesting side effect of the 'Right-to-Buy' policy implemented by the Conservative government of the UK during the 1980s and 1990s. The analysis suggests that by encouraging local authority tenants to buy their homes and thus reducing the size of the social rented housing sector, the policy is likely to have contributed to a significant reduction in regional unemployment disparities.[23]

In closing, we should note that this study neither seeks nor claims to represent the last word on the issue of the relationship between housing markets and the spatial distribution of unemployment. The ending of the data sample in 1995 is potentially a limitation of the empirical analysis. While in the period up to 1999 the UK experienced only relatively modest increases in house prices, data from the more recent housing market boom may provide a more stringent test of the stability of the relationships examined in this paper. The estimates should therefore be treated with an appropriate degree of caution. Further work on the influence of housing market variables on the pattern of unemployment inflows and outflows, perhaps using more spatially disaggregated units of analysis, would be both feasible and desirable.

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private renting, rather than the rate of home ownership. As in the present paper, regional unemployment rates are found to be negatively related to the rate of private renting.

[23] Set against this, however, is the possibility that former council house homes bought by sitting tenants may be much less easy to re-sell. I am grateful to a referee for this point.

Table 1. Regional Unemployment Flow Rates and Average Rate of Unemployment, 1984-95.

	Inflow rate [a] (%)	Outflows relative to workforce [b] (%)	Outflows relative to unemployment [b] (%)	Unemployment rate [c] (%)
South East	13.8	12.8	173.2	7.7
East Anglia	14.5	13.5	193.1	7.3
South West	16.1	14.8	182.8	8.4
East Midlands	15.6	14.3	165.0	8.9
West Midlands	15.8	14.6	142.9	10.6
Yorks & Humberside	18.6	16.8	160.1	10.8
North West	18.7	17.0	149.8	11.6
North	21.8	19.4	150.7	13.2
Wales	19.7	17.8	162.0	11.4
Scotland	20.4	18.4	159.7	11.8

Source: author's calculations based on data from the National On-line Manpower Information Service and various editions of the *Employment Gazette*.

Notes

a. The number of inflows into unemployment per annum as a percentage of the workforce in employment at the beginning of the year.
b. The unemployment and workforce figures are measured at the beginning of the year.
c. Unemployed as a percentage of the workforce (beginning of year figures).

Table 2. Distribution of Regional Dwelling Stock by Tenure, 1984-95.

	Owner-Occupied (%)	Private Rented (%)	Social Rented (%)
South East	66.5	10.1	23.4
East Anglia	67.9	11.4	20.7
South West	71.7	11.0	17.3
East Midlands	69.0	8.5	22.6
West Midlands	65.9	6.8	27.4
Yorks & Humberside	64.2	8.3	27.5
North West	66.7	6.8	26.4
North	58.5	7.7	33.8
Wales	69.9	7.7	22.4
Scotland	49.0	6.5	44.5

Source: *Housing and Construction Statistics*

<u>Notes</u>

Columns may not sum to 100 due to rounding. The social rented sector comprises local authority rented accommodation and accommodation rented through housing associations.

Table 3. Determinants of the Rate of Inflows into Regional Unemployment, 1984-95.

Dependent Variable: $\ln i_{it}$

	(1)	**(2)**
$\ln i_{it-1}$	0.486	0.416
	(12.32)	(2.99)
$\Delta \ln gdp_{it}$	-0.259	-0.292
	(1.18)	(1.72)
$\ln fem_{it}$	-0.408	-0.134
	(1.77)	(0.48)
$\ln pfm_{it-1}$	0.187	0.181
	(3.99)	(2.46)
$\Delta \ln u_{it}$	0.313	0.381
	(6.72)	(5.36)
$\Delta \ln v_{it}$	-0.040	-0.027
	(2.00)	(1.53)
$\ln (w_{it} + w_{it-1})$	0.405	0.192
	(3.52)	(0.69)
$\ln man_{it}$	0.215	0.150
	(2.87)	(1.86)
$\Delta \ln omg_{it}$	0.415	0.227
	(3.16)	(2.25)
$\ln own_{it}$	-0.121	-0.377
	(1.41)	(1.70)
$\ln prent_{it}$	0.063	-0.056
	(1.18)	(0.76)
$\ln hprice_{it}$	-0.288	-0.211
	(6.65)	(1.67)
Constant	-3.382	-0.020
	(2.16)	(0.24)
s.e.	0.0243	0.0295
Estimation Method	IV	IV-AH
Sample period	1984-95	1985-95
Number of obs.	120	110
Sargan	$\chi^2(14) = 13.4$	$\chi^2(13) = 12.7$
IVLM	0.71	
Test of region dummies	$\chi^2(9) = 77.8$	
Test of time dummies	$\chi^2(11) = 129.8$	$\chi^2(10) = 105.2$

t-ratios based on heteroskedasticity-consistent standard errors are given in parentheses below the coefficients.

Notes

1. The equation in column (1) includes a full set of region and year dummies. In column (2) estimation is in first-differences so that the regional fixed effects drop out.

2. In column (1) $\Delta \ln omg_{it}$ and $\ln hprice_{it}$ are treated as endogenous. The additional instruments are: $\ln omg_{it-1}$, $\ln hprice_{it-1}$, $\Delta \ln gdp_{it-1}$, $\ln fem_{it-1}$, $\ln pfm_{it}$, $\ln u_{it-1}$, $\ln v_{it-1}$, $\ln man_{it-1}$, the log of the proportion of employed workers aged under 25, and the current and lagged values of the log of the rate of new hires, the log of the

proportion of long-term unemployed and the log of the proportion of the economically active of working age with a degree or equivalent. The equation includes a full set of time and year dummies.

3.   'Sargan' denotes Sargan's test of instrument validity. IVLM denotes a test statistic derived by Godfrey (1994) for testing for serial correlation (in this case of order one) in the disturbances of dynamic equations estimated by Instrumental Variables. A single regionally uniform coefficient is assumed under the alternative hypothesis. The test statistic has an asymptotic chi-squared distribution with one degree of freedom.

4.   The estimates in column (2) are produced using the procedure of Anderson and Hsiao (1981) to allow for the potential endogeneity of $\ln i_{it-1}$ and $\Delta \ln u_{it}$ (along with $\Delta\ln omg_{it}$ and $\ln hprice_{it}$). The procedure involves differencing the variables in the equation to remove the regional fixed effects and introducing $\ln i_{it-2}$ as an instrument for the lagged dependent variable. The Sargan test does not reject the validity of $\ln i_{it-2}$ as an instrument.

5.   See text and Data appendix for variable definitions and data sources.

Table 4. Determinants of the Rate of Outflows from Regional Unemployment, 1984-1995

	(1)	(2)
Dependent variable	$\ln x_{it}$	$\ln (x/u)_{it}$
$\ln h_{it}$	0.131	0.134
	(8.27)	(8.33)
$\ln u_{it}$	0.984	
	(25.84)	
$\ln infl_{it}$	0.542	0.569
	(13.55)	(20.58)
$\Delta \ln ltu_{it}$	-0.095	-0.106
	(3.51)	(3.89)
$\ln u25_{it}$	0.336	0.404
	(3.89)	(5.27)
$\ln older_{it}$	0.161	0.185
	(3.69)	(4.04)
$\Delta \ln img_{it}$	-0.081	-0.093
	(2.79)	(2.98)
$\Delta \ln omg_{it}$	-0.152	-0.229
	(1.83)	(2.98)
$\ln own_{it}$	0.092	
	(1.43)	
$\ln prent_{it}$	0.088	
	(2.97)	
$\ln (own + prent)_{it}$		0.094
		(2.90)
$\ln hprice_{it-1}$	0.079	0.071
	(2.95)	(2.88)
s.e.	0.0122	0.0130
Sargan	$\chi^2(12) = 3.09$	$\chi^2(14) = 3.15$
IVLM	1.50	1.32
Test of region dummies	$\chi^2(9) = 40.2$	$\chi^2(9) = 107.1$
Test of time dummies	$\chi^2(11) = 274.1$	$\chi^2(11) = 326.8$

t-ratios based on heteroskedasticity-consistent standard errors are given in parentheses below the coefficients.
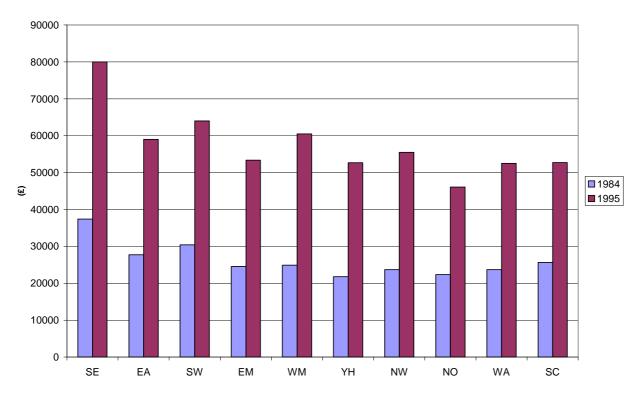
Notes

1. Each equation includes a full set of region and year dummies.

2. $\Delta \ln img_{it}$ and $\Delta \ln omg_{it}$ are treated as endogenous. The additional instruments used are: $\ln u_{it-1}$, $\ln h_{it-1}$, $\ln ltu_{it-1}$, $\ln u25_{it-1}$, $\ln older_{it-1}$, $\ln img_{it-1}$, $\ln omg_{it-1}$, the log of the rate of inflows of new vacancies, and the current and lagged values of the log of earnings, the log of the rate of new registrations for VAT, and the log of the variance of within-region county unemployment rates.

3. 'Sargan' denotes Sargan's test of instrument validity. IVLM denotes a test statistic derived by Godfrey (1994) for testing for serial correlation (in this case of order one) in the disturbances of dynamic

equations estimated by Instrumental Variables. A single regionally uniform coefficient is assumed under the alternative hypothesis. The test statistic has an asymptotic chi-squared distribution with one degree of freedom.

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

Figure 1. Regional House Prices, 1984 and 1995.

Source: *Housing and Construction Statistics*

Data Appendix

i – The Rate of Inflows into Unemployment
Inflows into unemployment as a proportion of the number of workers in employment at the beginning of the period. The inflow figures represent the number of new claimants to unemployment benefit (computerised claims only) in each year. Source: the National On-line Manpower Information Service (NOMIS) at the University of Durham. Employment figures for December of each preceding year were used to define the inflow rate and were obtained from various issues of the *Employment Gazette* (*EG*).

u – Unemployed as a Proportion of the Civilian Workforce
The number of claimants to unemployment benefit in January of each year, divided by the Civilian Workforce. Both the unemployment and the workforce figures were obtained from various issues of *EG*.

infl – Inflows into Unemployment Relative to the Beginning of Period Stock of Unemployment
Sources: as above.

x – Outflows from Unemployment Relative to the Civilian Workforce
Figures for the number of outflows from unemployment were obtained from data on the stock of unemployment and the level of inflows, using the identity that $U_{t+1} - U_t \equiv I_t - O_t$; where U_{t+j} denotes the stock of unemployed at the beginning of period t+j (j = 0,1), and I_t and O_t respectively denote the level of flows into and out of unemployment in period t.

h – Vacancy Outflows Relative to the Civilian Workforce
The numerator is the total annual off-flows of vacancies at job-centres. Source: NOMIS.

img, omg – 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*.

hprice – House Price
Average dwelling price for Building Societies' mortgage advances. Source: *Housing and Construction Statistics* (various).

own, prent - Percentage of Owner-Occupied and Private Rented Dwellings
Source: *Housing and Construction Statistics* (various).

gdp – Regional Gross Domestic Product per Capita
Regional gross domestic product per head at current prices. Source: *Regional Trends* (various issues).

fem – Female Share of Employment (%)
Source: *EG* (various issues).

pfm – Professional and Managerial Workers as a Percentage of Employees
Source: *Regional Trends* (various issues). From 1993, the figures relate to the number of professional, managerial and administrative, and associate professional and technical employees.

man – Manufacturing Share of Regional GDP
Source: *Regional Trends* (various issues). The GDP shares of Construction and the Service sector were also obtained from the same source.

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.

v – Vacancy Rate
Figures on the stock of vacancies notified to job-centres at January of each year were obtained from various issues of *EG*. The denominator is the civilian workforce.

Share of Young Workers in Employment (%)
We calculate this as follows. Firstly, we calculate the number of workers aged 16-24 using figures on the civilian workforce and the percentage of the civilian workforce aged 16-24, published in *Regional Trends*. Figures for total unemployment and *u25* are then used to calculate the number of unemployed workers aged under 25. By subtracting this number from the civilian workforce aged 16-24, we obtain an estimate of the level of employment among this age group, which finally we divide by total civilian employment to obtain the employment share.

The Proportion of the Economically Active of Working Age with a Degree or Equivalent
Source: *Regional Trends*, various issues.

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

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*.

Inflows of New Vacancies Relative to the Civilian Workforce
The vacancy flows series is obtained from NOMIS.

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33

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