

**IMMIGRATION AND INTER-REGIONAL MOBILITY IN THE UK,
1982-2000**

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ABSTRACT

The possible effects of higher immigration, raising unemployment and lowering earnings for locals, has been a contentious empirical issue and it has recently come to the fore in Britain. Most studies that look across local labour markets, chiefly for the US but recently for the UK, have found the effects of immigration to be benign. One possibility is that an influx of immigrants from abroad to a specific area simply pushes non-immigrants onwards to other localities and thereby spreads the labour market effects over the whole economy. We investigate this issue looking at net internal migration across 11 UK regions over two decades. While we find consistently negative crowding out effects, the results are not statistically very strong. Neither are they enhanced when embedded in a model that includes other variables that drive inter-regional migration or one that examines bilateral population flows between regions. We conclude that this particular channel of adjustment is fairly weak.

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Introduction

Mounting concern about the potential impact of immigration on the earnings and employment opportunities of non-immigrant workers has provided the background for a growing literature that has sought to measure these effects. One approach has been to examine the effects of immigration by looking across local or regional labour markets, within a given country, that have different rates of immigrant inflow from abroad to see if those with higher rates of immigration also have lower rates of wage increase or slower growth of employment for non-immigrant workers. This approach, sometimes called the “spatial correlations” approach, has generated a lively literature on the effects of immigration in the United States and some other countries such as Germany. The typical findings are that the wage and employment effects of immigration are negligible and this has led to further debate about what adjustment mechanisms account for these apparently small labour market effects.

In the UK this has not been such an important issue compared with these other countries until quite recently. But immigration to the UK has been on the increase. In 1975-9 there was a net outflow of 21,000 per annum; by 1994-8 this had become a net inflow of 73,000. The net inward balance increased particularly rapidly during the 1990s, and it is responsible for about half of the population growth during that decade. Recently, reforms to UK immigration policy have sought to make immigration easier for certain groups and there is active consideration of future policy initiatives. This puts the issue of the labour market effects of immigration firmly on the agenda. In an important study commissioned by the Home Office, Dustmann et. al. (2002) investigate the effects of immigration on unemployment rates and wage rates across UK regions. They find positive but largely insignificant effects on unemployment and small positive effects on wage rates. Thus, in line with much of the US literature, immigration seems to have relatively benign effects on the labour market.

Our purpose in this paper is to carry forward this research by investigating one possible mechanism through which the UK labour market adjusts to immigration. One argument put forward in the US context is that local labour markets adjust to an immigrant inflow through outflows to other localities of the native-born population and previous immigrant cohorts. In the absence of such mobility, any negative effects of immigration should be observed by differences across localities. But with perfect mobility across localities, the labour market impacts of immigration will not be

observed locally because the effects will be spread across the entire country. In this paper we investigate this issue by estimating the effects of net immigration on net internal migration across 11 UK regions over the 1980s and 1990s. We find that these effects, although operating in the expected direction are often insignificant and generally modest in size.

Immigration Effects and Non-Immigrant Labour Supply

As noted in the introduction, studies of the effects of immigration inflows on local labour markets have typically found only modest effects on wage and employment outcomes for non-immigrant workers. However individual studies have produced a range of results, some finding the expected negative effects (although these are often small), while others find zero or even positive effects. These findings, particularly those for the United States, have been summarised by Friedberg and Hunt (1995) and Borjas (1997) among others. The fact that immigrant-induced supply shocks are often found to be benign seems inconsistent with the widely held view that labour demand curves slope down and this has led to a questioning of the methodology used and a search for other channels of adjustment that might help to explain these apparently anomalous findings. According to Borjas, “One could easily argue that this literature has failed to increase our understanding of how labour markets respond to immigration. If we take the empirical evidence...at face value, the implications are disturbing: either we need different economic models to understand how supply shocks affect labour markets in different periods...or the regression coefficients are simply not measuring what we think they should be measuring (1997, p. 1740).

One of the main issues is that the effects of immigration on wages and/or unemployment may be masked by inter-regional labour mobility. To illustrate this more formally it is worth setting out a simple perfectly competitive model of labour supply and demand in a local labour market that includes inter-regional migration. In regional labour market i , where immigrant and non-immigrant labour are perfect substitutes, the change in total employment at time t can be represented as:

$$m_{i,t} + n_{i,t} = \Delta x_{i,t}^d - \alpha \Delta w_{i,t} + v_{i,t} \quad (1)$$

where $m_{i,t} = \Delta M_{i,t}/(M+N)_{i,t-1}$ is the growth in employment of immigrants as a proportion of the initial labour force (immigrant plus non-immigrant), and $n_{i,t} = \Delta N_{i,t}/(M+N)_{i,t-1}$ is the growth of non-immigrant employment, also as a proportion of the initial labour force. $\Delta x_{i,t}^d$ is the shift in labour demand, $w_{i,t}$ is the change in the (log) wage, the parameter α is the elasticity of labour demand with respect to the wage, and $v_{i,t}$ is a random disturbance.

The growth of immigrant labour supply is given by the following:

$$m_{i,t} = \beta_1(w_{i,t} - w_t^n) + \beta_2 z_{i,t} + u_{i,t} \quad (2)$$

where w_t^n is the (log) national average wage, $z_{i,t}$ is a region-specific immigration shock, and $u_{i,t}$ is a random disturbance term. Thus immigration to a region from abroad depends on the region's relative wage and other factors, absorbed in $z_{i,t}$, that could include conditions in source countries or previous immigrant inflows. Non-immigrant labour supply is also represented by a migration equation although here migration is inter-regional rather than international:

$$n_{i,t} = \gamma_1(w_{i,t} - w_t^n) - \gamma_2 m_{i,t} + e_{i,t} \quad (3)$$

Thus non-immigrant migration is determined by the region's relative wage, but there is also a direct negative effect of immigration. While inflows from abroad could crowd out non-immigrants from the region by reducing the local wage, there are other channels that might include the housing market, congestion effects, or even self-selected ethnic segregation effects.

Using (1) and (3) we can solve for the regional wage level (written here in terms of wage change) as a function of immigration and other variables:

$$w_{i,t} - w_{i,t-1} = \frac{\Delta x_{i,t}^d}{\alpha + \gamma_1} + \frac{\gamma_1(w_t^n - w_{i,t-1})}{\alpha + \gamma_1} + \frac{v_{i,t} - e_{i,t}}{\alpha + \gamma_1} - \frac{(1 - \gamma_2)m_{i,t}}{\alpha + \gamma_1} \quad (4)$$

In the special case where internal migration is unresponsive to the relative wage or to the direct crowding out effect of immigration, $\gamma_1 = \gamma_2 = 0$, and (4) reduces to:

$$w_{i,t} - w_{i,t-1} = \frac{\Delta x_{i,t}^d}{\alpha} + \frac{v_{i,t} - e_{i,t}}{\alpha} - \frac{m_{i,t}}{\alpha} \quad (5)$$

Studies of the labour market impact of immigration that assume away inter-regional mobility typically estimate some version of equation (5).

A number of things are worth noting about equations (4) and/or (5). The first is that, in either (4) or (5), $m_{i,t}$ will be correlated with the error term, $v_{i,t} - e_{i,t}$, since from equation (2) it is a function of the regional wage, $w_{i,t}$. Hence it must be instrumented, the appropriate instrument being $z_{i,t}$. Most studies have used as instruments past immigrant flows to the region or the stock of immigrants at the beginning of the period to reflect the well-documented tendency for new immigrants to join existing immigrant communities. The second methodological point is that most studies that use equation (5) omit the region-specific demand shock, $\Delta x_{i,t}^d$. Instead they assume that it can be accounted for by a nationwide shock, often represented in panel estimates by year dummies, plus a random regional component that is absorbed into the error term. If for some reason $\Delta x_{i,t}^d$ is correlated with $m_{i,t}$, omitting the former may bias the coefficient estimate on the latter (the same applies to equation (4)).

The third point is that in equation (5) the coefficient on $m_{i,t}$ is simply the inverse of the labour demand elasticity (hence the need to find an instrument from the labour supply function). The fact that the estimated coefficients are often close to zero seems inconsistent with the evidence from direct estimates of the labour demand elasticity, which often find it to be less than one; hence its reciprocal should be larger than one rather than close to zero. However it is possible that, at the regional level, labour demand could be very elastic, either because other factors, such as capital are mobile, or perhaps because immigration produces local demand effects (in which case the coefficient on $m_{i,t}$ should increase when $\Delta x_{i,t}^d$ is added to the equation). The fourth point, more directly relevant to what follows, is that if equation (4) is the correct specification, then the coefficient on $m_{i,t}$ will be a downward biased estimate of the inverse labour demand elasticity; the larger are γ_1 and γ_2 , the greater is the downward bias. It is worth noting also that specification (4) should include the ratio of the national to the (lagged) regional wage.

The earliest and most influential studies for the United States found that the wage and employment effects of immigration were small (Altonji and Card, 1991; Lalonde and Topel, 1991), findings that have been largely upheld by further research. However these often failed to take internal migration into account and there has been growing acceptance that this is a major source of downward bias. More recently Borjas (2002) has examined the effects of immigration using nation-wide education and experience groups rather than local areas as the units of observation. Since there is less scope for mobility across these categories there should be less downward bias in the estimate. He finds larger negative effects on wage rates than do previous studies: an increase in immigration equivalent to ten percent of the labour force leads to a decline in the wage for native born workers of 3 percent. Local area studies of immigration in Europe and Germany in particular have found some negative wage and unemployment effects (Winkleman and Zimmermann, 1993; DeNew and Zimmermann, 1994; Angrist and Kugler, 2001), possibly a reflection of lower inter-regional mobility and differences in labour market institutions.¹

Given that these wage and employment effects are small, some studies have turned to examining the inter-regional displacement effects directly. In his account of large scale Cuban immigration to Miami at the time of the Mariel Boatlift in 1980, Card (1990) found that this had very little effect on the wages and employment of the native born—implying adjustment took place through internal migration. Looking more generally at changes across localities, Filer (1991) found that immigrants crowded out interregional migrants almost one for one. However, more recent studies that disaggregate by occupation or skill level find little evidence of such effects (Card, 2001).

It is useful to solve equations (1) and (3) for the change in non-immigrant labour supply to give:

$$n_{i,t} = \frac{\gamma_1 \Delta x_{i,t}^d}{\alpha + \gamma_1} - \frac{\alpha \gamma_1 (w_t^n - w_{i,t-1})}{\alpha + \gamma_1} + \frac{\gamma_1 v_{i,t} + \alpha e_{i,t}}{\alpha + \gamma_1} - \frac{(\gamma_1 + \alpha \gamma_2) m_{i,t}}{\alpha + \gamma_1} \quad (6)$$

If γ_1 and/or γ_2 is greater than zero then the coefficient on $m_{i,t}$ in equation (6) will be negative (otherwise zero). Studies that focus on mobility typically estimate some

¹ However Pischke and Velling (1997) find little evidence of immigration on unemployment across

version of (6), although often without the controls for relative wages and demand shocks. As before, in principle, it is necessary to instrument the immigration variable $m_{i,t}$. It is also worth noting that the effects of immigration on non-immigrant mobility are not independent of the labour demand elasticity; if α is “large” then the effect of $m_{i,t}$ in (6) could be close to zero even though γ_1 and/or γ_2 are substantially larger than zero. Thus, finding negligible effects of immigration on internal migration, not controlling for employment, could be consistent with the results of studies that find interregional migration is large in response to *shifts* in employment (Katz and Krueger, 1992).²

Finally there are two, more general, points to make. The first is that, for simplicity, in the framework set out above, the market clears and there is no unemployment. However a broadly analogous system could be set out where wages do not adjust and where immigration and internal migration are determined by inter-regional differences in unemployment rates. Secondly, much of the literature using this framework distinguishes between the two groups of native-born and foreign-born. But some of the ‘immigrants’ could be native born (especially if immigration is measured net and therefore deducts emigrants from the total). And some of the internal migrants could be foreign-born who move subsequent to immigration. What matters is the labour market effects of immigration from outside the country on internal migration rather than the labels of native-born and foreign-born.

Immigration and Internal Migration in the UK

Growing interest in the effects of immigration has gone hand in hand with a sustained increase in immigration. The overall net inflow to the UK is graphed in Figure 1. These data come from the International Passenger Survey (IPS), which is based on a sample of travellers arriving and departing at UK airports and the channel tunnel. Immigrants are defined as those arriving in the UK for at least a year after having been abroad for at least a year; emigrants are those going abroad for at least a year after at least a year in the UK. The overall net inward balance increased from an

local labour markets in Germany.

² For Europe it has been found that adjustment occurs largely through variations in participation (Decressin and Fatás, 1995) although recent evidence suggests that migration may be more important than previously thought (Tani, 2003). These studies, however, focus on the effects of demand shocks

net outflow of 35,000 per annum in the 1970s rising to a small net inflow of 7,000 per annum in the 1980s and a larger net inflow of 56,000 in the 1990s. Although the figures for the 1990s are subject to downward revision in the light of the 2001 census, they would still represent higher immigration than earlier decades.³ The net immigration figures are the balance of much larger gross flows. In the 1990s the IPS statistics indicate that gross inflows averaged 180,000 per year.

A significant share of the long-term trend increase in net immigration is due to the decline in the net outflow of UK citizens, chiefly to traditional destinations such as the United States, Canada, Australia, New Zealand and South Africa. Net immigration of foreign citizens shows some rise in trend with an annual net inflow of about 80,000 per year in the 1990s compared with 45,000 in the 1980s. In part, this reflects a rise in in-migration from the European Union where no visa restrictions apply. But there have also been increases in net immigration from most other parts of the world. Studies of these immigration flows show that they are determined by economic conditions at home and abroad, operating through the ‘filter’ of immigration policies. The pattern of flows to and from different parts of the world is also conditioned by the source country composition of the existing stock of foreign born residents in the UK and by the stock of British-born at different overseas destinations (Hatton, 2002).

Our focus is on differences in the net inflow of migrants from abroad across different UK regions. Table 1 shows gross and net inflows from abroad (for all citizenships) into eleven Standard Statistical Regions as a percentage of the regional populations. While gross inflows are sometimes sizeable, especially if cumulated over a number of years, the annual average net inflow is typically very small. During the 1980s it was less than 1 per thousand of the population in all regions with the exception of Greater London, where it averaged 1.8 per thousand. By comparison, the figures for the 1990s reflect a general rise in immigration to all regions, with the Rest

rather than on the supply shocks from immigration that are at issue here. To date there has been little work in this vein that integrates shocks from both sides of the market.

³ The IPS statistics measure inflows and outflows of British and foreign citizens and have long been regarded as a reliable indicator of overall trends. However they do not include movements between the UK and the Republic of Ireland and they do not capture most asylum seekers and visitor switchers. Comparisons in the light of the 2001 census suggest that, during the 1990s, they may also have underestimated the outflows of British citizens. A preliminary estimate that adjusts for flows to and from Ireland, for asylum seekers and for the putative undercount of British emigrants suggests that the average annual net inflow for 1991–2000 was 33,000 rather than 56,000 as indicated by the unadjusted IPS data plotted in Figure 1.

of the Southeast and East Anglia experiencing inflows from abroad of one per thousand. But again London stands out, with the inflow in the 1990s doubling to nearly 4 per thousand.

Table 2 shows the regional location of UK-born and foreign-born as shares of the relevant totals for Great Britain from the 1991 census. It illustrates that the bias towards London is reflected in the population stock by place of birth. While nearly 40 percent of the foreign-born were located in Greater London only 10 percent of the UK born lived there in 1991. While the Rest of the Southeast, East Anglia and the East Midlands had foreign-born shares that are similar to the national average, the foreign born are underrepresented in all other regions. These patterns differ somewhat by place of overseas birth. In particular the over-representation of the foreign born in London is greatest among those from New Commonwealth countries and least among those from the EU. In the rest of the Southeast those born in the Old Commonwealth and EU are over-represented while those from the New Commonwealth are under-represented. Those born in the New Commonwealth are over-represented in the East Midlands while those from the Old Commonwealth are over-represented in Scotland. With a few exceptions, those from the EU and Other Foreign countries have regional concentrations similar to the foreign-born as a whole.

How does the net flow of migrants from abroad compare with the flow of migrants *within* the UK? Table 3 shows the net and gross flows to and from UK regions. These are based on National Health Service registration data for those whose registration changes from one region to another. These include all individuals regardless of nationality or place of birth and they represent movements within the UK including Northern Ireland. On this basis, about 2 percent of the population changes region each year. As with the international migration flows the net balances are small relative to the gross flows. Perhaps the most striking feature is the persistent net outflow from London. Other regions in the south and east exhibit persistent net inflows while the northern regions and Scotland have small net outflows. It is tempting to suggest that net immigration to London from abroad has been associated with a displacement of population from London to other regions. However, there is no

evidence, at least in the regional cross-section, of an inverse correlation between immigration and regional in-migration across the other regions.⁴

Previous analyses of internal migration find that population or labour force flows take place in response to variables representing regional labour market conditions. The key variables used in these analyses are unemployment and vacancy rates, wages and house prices (McCormick, 1997). One study using the NHS registration data up to the mid 1980s found effects on net in-migration in the expected direction arising from unemployment and vacancy rates as well relative house prices, but not from relative wage rates (Jackman and Savouri, 1992). Studies of regional mobility that use individual level data do tend to find conventional wage effects but sometimes find weaker or perverse effects for some of the other key variables (Pissarides and Wadsworth, 1989; Hughes and McCormick, 1994). Overall these studies indicate that interregional migration does serve as an equilibrating response to persistent differences in labour demand, but only to a limited extent. Evaluating these equilibrating effects Pissarides and McMaster (1990) found that inter-regional migration would take ten years to eliminate half of an initial unemployment differential.

More recently the focus has shifted to the effects on mobility of regional house price differentials. These consistently work in the opposite direction to the wage incentives: higher relative house prices discourage net in-migration. Cameron and Muellbauer (1998) find that while the level of house prices has a strong negative effect on in-migration, the expectation of capital gains through house price *increases* has a positive effect. Less attention has been paid to shifts on the supply side of the labour market. Only one study has examined the effects of immigration on inter-regional migration. Focusing on the Southeast region, Muellbauer and Murphy (1988) found a strong negative relationship between the change in immigration and the level of interregional in-migration. To the extent that immigration raises house prices, one would expect that any direct crowding out effect in interregional migration would be greater when house prices are omitted than when they are included.

⁴ Conurbations outside London also exhibit net gains from overseas and net losses to the rest of the UK but these are masked in the wider regions (Champion, 1999). It is worth noting that census statistics are for place of residence, not workplace; some of the shift out of the cities may involve commuting from outside the urban conurbations, particularly London.

Estimates of Net Inter-Regional Migration

We examine the effects of immigration on net inter-regional migration by estimating a version of equation (6) above. Our regions are the Standard Statistical Regions excluding Northern Ireland but separately distinguishing Greater London and the rest of the Southeast, as in Tables 1 and 2. The dependent variable is total net inter-regional in-migration to a region using the National Health Service registration flows as summarised in Table 3, divided by population lagged one year. The immigration series are the IPS series for net immigration from overseas, also deflated by (lagged) regional population. It is important to note that these are population flows, not labour force flows, although previous studies suggest that labour market variables are important in explaining these. Note also that these are total net movements, irrespective of nationality or birthplace. Thus net immigration from abroad includes the net movement of UK-born or UK nationals and the net internal migration includes onward net movements of British and foreign-born immigrants.

The labour market variables include the claimant count unemployment rate and the labour exchange/job centre vacancy rate. These are taken from the NOMIS database and are divided by the labour force base from the same source. We also include the vacancy inflow rate as suggested in recent studies of labour market matching (Coles and Smith, 1998). For the regional wage rate we use average weekly earnings net of overtime from the New Earnings Survey. Finally, following the literature on migration and house prices, we include the level and the change in the regional house price index.

The maximum period for which all these series could be assembled is for the years from 1982 to 2000 (allowing for one lag), giving a panel of 209 observations (19 years \times 11 regions). We use panel regression with regional fixed effects and we include a full set of year dummies. With the exception of the migration variables, all other variables are taken as the natural logs. Including the year dummies is equivalent to estimating on deviations from the cross sectional mean and therefore there is no need to define the variables as differences from the national average, since these effects will be taken out by the dummy for each year. This also takes out the effects of economy-wide conditions on internal mobility that some studies have identified (e.g. Jackman and Savouri, 1992). It has the further advantage that any national biases in

the measurement of net immigration or inter-regional migration will also be eliminated by the year dummies.

In initial estimation we experimented with different methods of instrumenting the net immigration rate, with little effect on the results. Those presented in Table 3 simply use the one period lagged value of net immigration to the region as a regressor rather than as the instrument for the contemporaneous variable. Equation (1) excludes all other variables except the year dummies (not reported). The coefficient is negative as expected but it is not significant at conventional levels. For what it is worth, the coefficient suggests that an increase of 100 in net immigration to a region generates a net out migration to other regions of 14. Thus, even if it were significant, the ‘crowding out’ effect of net immigration appears to be relatively modest.

As suggested earlier, the effect of net immigration on internal migration could be reduced or increased over its unconditional effect, when other variables are added. If net immigrants generate an increase in employment, either through demand or supply effects, then the displacement should be greater when these effects are held constant. Equation (2) attempts to test this hypothesis. Of the two variables representing vacancies, the inflow dominates the stock and so the latter was dropped. The coefficient implies that a ten percent rise in the vacancy inflow rate increases the net inter-regional in-migration rate by 0.55 per thousand of the population. By contrast the unemployment rate gives the ‘wrong’ sign and is almost significant at the 5 percent level. The log of average earnings (lagged one period as suggested by equation (6)) is also insignificant but with the expected sign. Together, these additional variables make very little difference to the effect of the net immigration rate on net internal migration, suggesting that indirect effects through labour demand are broadly neutral.

The third equation in Table 3 adds the level and the change in the regional house price index. As other studies have suggested, these are important variables driving inter-regional migration. The levels effect is strongly negative, suggesting that housing costs are the key component of regional differences in living costs (consistent with the increase in the size and significance of the coefficient on earnings). However, the effect of the *change* in the house price index is positive and it has an even larger coefficient. This perhaps reflects the effect on inter-regional migration of prospective capital gains in the housing market. If immigration crowded out inter-regional in-migration through the housing market, then its effects should be smaller when house

prices are included. The fact that the coefficient on net immigration is little altered may reflect the fact that the effect of house prices on inter-regional migration cuts in both directions—raising living costs on the one hand, and representing prospective capital gains on the other.

As we have seen, the gross flows of international migration tend to be larger relative to population in the southern regions of the UK, particularly London. Certainly the stocks of foreign-born are larger in the southern regions than in the north. Given that inter-regional (gross) flows decline with distance, one might suspect that displacement effects would be larger for the southern half of Britain than in the more peripheral regions of the north and west. In order to explore this issue, regressions restricted to six southern regions are presented in Table 5. The regions included are: London, the rest of the Southeast, the Southwest, East Anglia, the West Midlands and the East Midlands.

The estimates of displacement effects in Table 5 are somewhat larger and more significant than those for the entire set of regions in Table 4. When no other variables are included, the displacement effect is 0.22 and is significant at the 5 percent level. Adding the labour market variables makes little difference, although, as before, the unemployment rate gives the ‘wrong’ sign. Introducing the house price variables weakens the significance of the displacement effects. The loss of significance on the house price variables probably reflects the stronger correlations between regional house price movements in the southern half of the country. Overall these results suggest that it is worth taking directly into account the degrees of proximity between regions when assessing the displacement effects of net immigration.

Examining Bilateral Net Inter-Regional Flows

In order to explore inter-regional flows more fully we extend our model to bilateral net population flows between the 11 regions. Our estimating framework can be expressed as follows:

$$n_{ij,t} = \omega_{ij} [\lambda(x_{j,t} - x_{i,t}) + \phi(m_{j,t} - m_{i,t})] + \varepsilon_{ij,t} \quad (7)$$

where $n_{ij,t}$ is the net inter-regional flow from region i to region j at time t divided by half the combined populations of the two regions (at $t-1$). The term $(x_{j,t} - x_{i,t})$ represents a vector of variables determining migration from i to j , expressed as the difference between region j and region i at time t , with coefficient vector λ . The term $(m_{j,t} - m_{i,t})$ is the inflow of immigrants to region j minus the inflow to i , both divided by half the combined populations of the two regions. The parameter ω_{ij} is a weight that reflects the degree of association between the labour markets of regions i and j . We use as weights the sum of *gross* inter-regional flows from i to j and from j to i over the whole period from 1981 to 2000. These are divided through by the sum of the average population of i and j and scaled so that the mean of ω_{ij} is one.

The weighting system we use scales up the coefficients for regional pairs that have more two-way traffic between them. This reflects degrees of contiguity, distance, size and density that would otherwise be difficult to capture as a single summary variable.⁵ As before we estimate fixed effects regressions with the full set of bilateral fixed effects ($11 \times 11 = 121$), and with year dummies. However, since there is no common reference category for each variable such as the national average, the regressors must now be entered as differences between i and j .

The results for these bilateral flows are shown in Table 6. When no other variables are included the coefficient on the net immigration rate difference is negative but not significant, although its magnitude is consistent with the estimate in Table 4 (since there are ten bilateral flows for each region the Table 6 coefficients should be smaller by a factor of about ten). Adding the labour market and house price variables reduces the coefficient on net migration almost to zero. However, in column (3) the other variables take the expected signs and are generally significant, giving some support to the model overall.

As an alternative, Table 7 presents the results from estimating the same model without applying weights to the explanatory variables. As before the coefficients on the net immigration rate remain insignificant. The coefficient in column (3) is somewhat larger than the other estimates and all the other variables are significant

⁵ Most studies of bilateral inter-regional flows include measures of distance and/or contiguity as fixed regressors, which would be eliminated in a fixed effects regression. It seems to us more plausible also to allow the slope coefficients to become smaller as the degree of association between two regions decreases. Burgess and Profit (2001) find evidence in matching functions for UK travel to work areas of spatial inter-dependence (presumably due to migration) with coefficients that increase with contiguity and decline with distance.

with the expected signs. In this respect, these results are consistent with those of other studies that have investigated the effects of labour market variables and house prices on bilateral inter-regional flows. But they also suggest that, even if net immigration causes some displacement across regions, it does not contribute much to explaining the *direction* of internal migration flows.

Conclusion

We have investigated for the first time the hypothesis that net immigration is a determinant of inter-regional migration flows in the UK. If there were large displacement effects, then this would contribute to understanding why the local labour market effects of immigration seem to be relatively benign. While there is weak evidence of consistently negative correlations between immigration from abroad and in-migration from other UK regions, it does not seem to be strengthened by the other variables that drive internal migration. Neither is the effect enhanced by shifting the focus from net flows by region to bilateral net flows, even though other components of the migration model are supported.

It seems appropriate to conclude with two caveats. First, spatial displacement effects may not be readily observed at the relatively high levels of aggregation used here. Disaggregating to smaller localities and by labour market status, age and skill level might produce stronger effects. Second, even if displacement effects are found to be modest there may be other adjustment mechanisms, through goods and capital markets, which help to mute the local labour market effects of immigration. If these operate more strongly at the local level than they do for the whole economy, then there could still be negative labour market effects in aggregate although these would be much harder to observe.

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Table 1
Gross and Net International Migration by Region
 (Per Thousand of Regional Population)

	1981-1990	1981-1990	1981-1990	1991-2000	1991-2000	1991-2000
	Gross Inflow	Gross Outflow	Net Inflow	Gross Inflow	Gross Outflow	Net Inflow
London	10.1	-7.5	1.8	13.2	9.3	3.9
Rest of S. East	5.1	-4.9	0.6	5.6	-4.4	1.0
East Anglia	4.6	-4.6	0.2	5.4	-4.5	1.2
South West	3.5	-3.7	-0.2	3.8	-3.3	0.5
West Midlands	2.3	-2.4	-0.1	3.0	-2.4	0.6
East Midlands	2.3	-2.1	0.2	2.9	-2.5	0.4
Yorks & Humber	2.4	-2.3	0.04	3.2	-2.3	0.9
North West	2.7	-2.6	0.1	2.9	-2.4	0.5
North	1.8	-2.4	-0.6	2.2	-1.9	0.3
Wales	1.8	-2.4	-0.6	2.4	-1.8	0.5
Scotland	2.5	-3.8	-0.1	3.5	-3.6	-0.2

Source: International Passenger Survey, provided by ONS.

Table 2
Regional Shares of GB Population by Birthplace, 1991
 (Percentage of each birthplace category)

	UK Born	Non-UK Born	Old CW	New CW	EU	Other Foreign
London	10.2	38.4	30.1	43.3	27.7	37.4
Rest of S. East	19.2	18.4	24.6	14.7	25.5	19.5
East Anglia	3.7	3.1	3.6	1.7	4.2	4.3
South West	8.6	5.2	9.0	3.6	8.5	5.4
West Midlands	9.4	9.0	4.5	11.8	5.4	7.5
East Midlands	7.3	5.5	4.1	6.3	5.6	4.5
Yorks & Humber	9.1	5.5	4.3	6.3	5.8	4.6
North West	11.7	7.3	6.0	6.9	6.2	8.4
North	5.8	1.7	2.5	1.4	2.6	1.6
Wales	5.4	2.0	2.6	1.4	3.3	2.3
Scotland	9.5	3.9	8.7	2.6	5.2	4.5

Source: 1991 Census Report for Great Britain (Part 1), HMSO 1993, Vol 1. Table 7.

Table 3
Gross and Net Inter-Regional Migration, 1981-2000
(Percentage of Regional Population)

	1981-1990	1981-1990	1981-1990	1991-2000	1991-2000	1991-2000
	Gross Inflow	Gross Outflow	Net Inflow	Gross Inflow	Gross Outflow	Net Inflow
London	2.33	3.02	-0.69	2.26	2.99	-0.73
Rest of S. East	2.56	2.30	0.27	2.49	2.25	0.23
East Anglia	3.08	2.35	0.70	2.91	2.43	0.48
South West	2.80	2.09	0.71	2.73	2.19	0.54
West Midlands	1.49	1.68	-0.18	1.66	1.81	-0.16
East Midlands	2.26	2.02	0.23	2.44	2.18	0.26
Yorks & Humber	1.59	1.66	-0.07	1.79	1.85	-0.06
North West	1.29	1.56	-0.27	1.48	1.66	-0.18
North	1.43	1.60	-0.17	1.55	1.65	-0.10
Wales	1.86	1.62	0.24	1.87	1.75	0.12
Scotland	0.88	1.03	-0.15	0.96	0.96	0.00

Source: National Health Service registration statistics, provided by ONS.

Table 4
Estimates of the Net Inter-Regional In-Migration Rate, 1982-2000
(Fixed effects panel estimates, 11 regions)

	(1)	(2)	(3)
Net immigration rate (t-1)	-0.14 (1.5)	-0.12 (1.3)	-0.10 (1.2)
Log vacancy inflow/labour force (t)		0.55 (3.9)	0.36 (2.6)
Log unemployment rate (t)		0.23 (1.8)	-0.22 (1.4)
Log average earnings (t-1)		0.73 (0.9)	1.22 (1.5)
Log house price (t)			-0.85 (4.2)
Δ Log house price (t)			1.32 (4.9)
Adj, R ²	0.83	0.85	0.87
Hetero ($\chi^2_{(1)}$)	0.64	3.07	2.06
No of observations	209	209	209

Note: 't' statistics in parentheses.

Table 5
Estimates of the Net Inter-Regional In-Migration Rate, 1982-2000
(Fixed effects panel estimates, 6 southern regions)

	(1)	(2)	(3)
Net immigration rate (t-1)	-0.22 (2.1)	-0.25 (2.3)	-0.18 (1.6)
Log vacancy inflow/labour force (t)		0.48 (2.5)	0.48 (2.5)
Log unemployment rate (t)		0.30 (1.2)	-0.09 (0.3)
Log average earnings (t-1)		1.63 (1.5)	2.70 (2.4)
Log house price (t)			-0.75 (2.3)
Δ Log house price (t)			0.87 (1.6)
Adj, R ²	0.89	0.89	0.89
Hetero ($\chi^2_{(1)}$)	4.04	0.00	0.02
No of observations	114	114	114

Note: ‘t’ statistics in parentheses.

Table 6
Estimates of Bilateral Net Inter-Regional In-Migration Rates, 1982-2000
(Fixed effects panel estimates, 11 regions, variables weighted. Dependent variable: inter-regional net migration to *i* from *j*)

	(1)	(2)	(3)
Net immigration rate (<i>i</i> minus <i>j</i> at t-1)	-0.012 (0.5)	-0.0004 (0.0)	-0.002 (0.1)
Log vacancy inflow/labour force (<i>i</i> minus <i>j</i> at t)		0.021 (1.3)	0.020 (2.4)
Log unemployment rate (<i>i</i> minus <i>j</i> at t)		-0.022 (1.2)	-0.029 (1.9)
Log average earnings (<i>i</i> minus <i>j</i> at t-1)		0.164 (2.2)	0.266 (3.9)
Log house price (<i>i</i> minus <i>j</i> at t)			-0.147 (6.2)
Δ Log house price (<i>i</i> minus <i>j</i> at t)			0.104 (2.2)
Adj, R ²	0.91	0.92	0.93
No of observations	1045	1045	1045

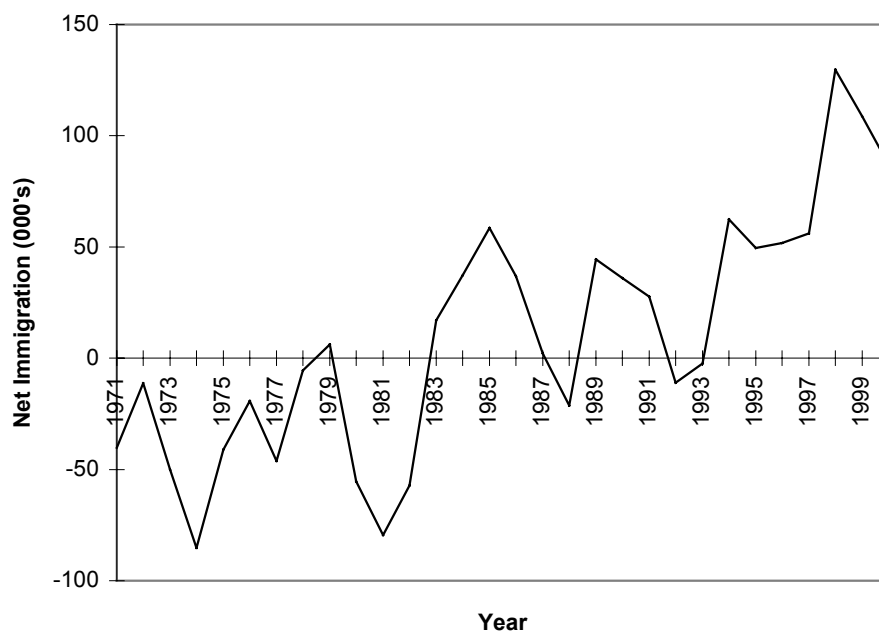
Note: ‘t’ statistics in parentheses calculated from robust standard errors.

Table 7
Estimates of Bilateral Net Inter-Regional In-Migration Rates, 1982-2000
(Fixed effects panel estimates, 11 regions, variables unweighted. Dependent variable:
inter-regional net migration to *i* from *j*)

	(1)	(2)	(3)
Net immigration rate (<i>i</i> minus <i>j</i> at <i>t</i> -1)	-0.005 (0.4)	-0.008 (0.7)	-0.020 (1.4)
Log vacancy inflow/labour force (<i>i</i> minus <i>j</i> at <i>t</i>)		0.024 (4.7)	0.018 (3.6)
Log unemployment rate (<i>i</i> minus <i>j</i> at <i>t</i>)		0.003 (0.4)	-0.024 (2.7)
Log average earnings (<i>i</i> minus <i>j</i> at <i>t</i> -1)		0.053 (1.3)	0.089 (2.1)
Log house price (<i>i</i> minus <i>j</i> at <i>t</i>)			-0.072 (4.1)
Δ Log house price (<i>i</i> minus <i>j</i> at <i>t</i>)			0.070 (3.7)
Adj, R ²	0.91	0.91	0.92
No of observations	1045	1045	1045

Note: 't' statistics in parentheses calculated from robust standard errors.

Figure 1
Net Immigration to the UK, 1971-2000



Source: International Passenger Survey.