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No. 4061

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LABOUR ECONOMICS



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September 2003

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CEPR Discussion Paper No. 4061

September 2003

ABSTRACT

Immigration and Inter-Regional Mobility in the UK, 1982-2000*

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, thereby diffusing the labour market effects over the whole economy. Examining net internal migration across 11 UK regions over two decades, we find consistently negative displacement effects. They imply that immigration to a region of foreign nationals generates between a third and two thirds as much out-migration to other regions. The effects appear to be larger and more significant for the southern regions where the inflow of foreign nationals is greatest.

JEL Classification: J60 and R10

Keywords: immigration, inter-regional migration and UK labour market

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*We would like to thank members of the Office for National Statistics for providing some of the data used here, in particular Mike Harris, Alison Snell, Ian Parker, Robert Palmer, Kanak Ghosh, Rhian Tyler, Alastair Davies and Chris Hunt. Hatton also thanks the British Academy for support through a Research Readership. We are grateful to Alison Booth, Deborah Cobb-Clark and to participants at the Royal Economic Society Conference at Warwick, 2003, for many useful comments.

Submitted 15 August 2003

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, as Figure 1 shows, immigration to the UK has been on the increase. In 1976-80 there was a net inflow of 37,200 foreign citizens per annum; by 1996-2000 this had increased to a net inflow of 110,200 per annum. Immigration 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. (2003) 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 in 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 are potentially important, especially in the South of England where the inflow of immigrants is largest relative to the regional population.

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 labour 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 displacement 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, $w_{i,t}$. One approach would be to instrument $m_{i,t}$ using some component of $z_{i,t}$. 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 immigrant 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 good markets are highly integrated or because other factors, such as capital, are mobile.¹ 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

¹ Another possibility is that immigration *shifts* labour demand upwards. In that case the coefficient on $m_{i,t}$ should be more negative when $\Delta x_{i,t}^d$ is added to the equation, since the latter should capture the immigrant-induced demand shift. Chapman and Cobb-Clark (1999) examine the conditions under

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 (2003) 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 (Winklemann 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.²

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).

The earliest US findings suggest that regional migration was relatively elastic. In his study 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

which the demand effects of immigration will outweigh the labour supply effects on the job prospects of residents.

² However Pischke and Velling (1997) find little evidence of any effects of immigration on unemployment across local labour markets in Germany.

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 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.

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, finding negligible effects of immigration on internal migration, not controlling for employment shocks, could be consistent with the results of studies that find interregional migration is large in response to *shifts* in labour demand (Katz and Krueger, 1992).³

Immigration and Internal Migration in the UK

Growing interest in the effects of immigration has coincided with a sustained increase in immigration. The overall net inflow of foreign citizens 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 taken at UK arriving and departing at UK airports and the channel tunnel. International migrants are defined as those arriving (or leaving) the UK for at least a year after having resided for at least a year in the UK (or abroad). Net immigration of foreign citizens increased from 38,200 per annum in the 1970s rising to a 44,600 in the 1980s and then more sharply to 85,300 per annum in the 1990s.⁴ These net immigration figures are the balance of much larger flows. In

³ 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 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.

⁴ The IPS data is generally thought to underestimate some classes of immigrants such as asylum seekers and visitor switchers (those who arrive initially for a short period but stay longer). Adjusting for these and for the movement of Irish nationals who are not enumerated in the survey, the Office for National Statistics estimates net immigration of foreign citizens at 135,400 per annum 1991-2000. However, adjusted estimates are not available back to the 1980s and so we rely here on the unadjusted figures.

the 1990s the gross inflow averaged 175,600 per annum while gross outflows averaged 90,300 per annum. It is worth noting that the definition of immigration used here excludes the emigration and immigration of British citizens, which produced an annual net outflow of 21,600 per annum in the 1990s.⁵

The increase in the immigration of foreign citizens largely reflects a rise in immigration 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. Among these the most important areas are the New Commonwealth, particularly the Indian subcontinent, Old Commonwealth countries (including South Africa), and the United States. 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 (Hatton, 2003).

Our focus is on differences in the net inflow of foreign citizens to different UK regions. Table 1 shows gross and net inflows from abroad into eleven Standard Statistical Regions per thousand 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 fairly 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 nearly 3 per thousand and the rest of the Southeast at 1.7 per thousand. By comparison, the figures for the 1990s reflect a general rise in immigration to all regions, with East Anglia, the West Midlands and Yorkshire and Humberside now experiencing inflows of foreign citizens of more than one per thousand. But again London stands out, with the annual inflow in the 1990s exceeding 4 per thousand.

Table 2 shows the regional location of UK-born and foreign-born as shares of regional populations 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 their shares of the UK born, the foreign born are underrepresented in all other regions. These patterns differ somewhat by place of

⁵ The long-term upward trend in net immigration across all citizenships since the early 1970s is partly

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 little evidence, at least in the regional cross-section, of a strong inverse correlation between immigration and regional in-migration across the other regions.⁶

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

due to the fall in net emigration among British citizens (see Hatton, 2002).

⁶ 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).

(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 displacement effect in interregional migration would be greater when house prices are omitted than when they are included.

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 the region's population lagged one year. The immigration series are the IPS series for net immigration of foreign citizens from overseas, also divided by 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 them.

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.⁷ We also include the vacancy inflow rate as suggested in 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.⁸

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 instrumented the net immigration rate, using its lagged value.⁹ The results presented in Table 4 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 about 35. Thus, the displacement effect could be substantial.

As suggested earlier, when other variables are added, the effect of net immigration on internal migration could be reduced or increased over its unconditional effect. If net immigrants generate an increase in employment, either

⁷ Available at <http://www.nomisweb.co.uk>

⁸ Earnings data were provided by the Office for National Statistics. House price indices were obtained from the Office of the Deputy Prime Minister at <http://www.housing.odpm.gov.uk/statistics/live/houseprices>

⁹ When instrumental variables are used the negative coefficients on net immigration was always larger than in the OLS regressions in Tables 4-7, although the standard errors were also larger.

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 0.56 per thousand of the population. By contrast the unemployment rate gives the ‘wrong’ sign and is almost significant. 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 operating 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 causes crowding out 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—a fact that is also reflected in population stocks. 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 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 0.5 and is significant at the 5 percent level. Adding the labour market variables and house prices reduces the coefficient slightly but it remains significant. As before, adding the house price variables changes the sign on unemployment and increases the size and significance of the earnings variable. The estimate of the displacement effect for the southern regions alone suggests that for every 100 additional immigrants to these regions, 43 others are displaced to locations elsewhere in the UK.

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. Since there is no common reference category for each bilateral flow (such as the national average) the regressors must now be entered as differences between regional one region and another. Our estimating framework can be expressed as follows:

$$n_{ij,t} = \lambda(x_{i,t} - x_{j,t}) + \varphi(m_{i,t-1} - m_{j,t-1}) + \varepsilon_{ij,t} \quad (7)$$

where $n_{ij,t}$ is the net inter-regional flow from region j to region i at time t divided by half the combined populations of the two regions (at $t-1$). The term $(x_{i,t} - x_{j,t})$ represents a vector of variables determining migration from j to i , expressed as the difference between region i and region j at time t , with coefficient vector λ . The term $(m_{i,t-1} - m_{j,t-1})$ is the inflow of immigrants to region i minus the inflow to j , both divided by half the combined populations of the two regions(at $t-1$).¹⁰

The results for these bilateral flows are shown in Table 6. We estimate fixed effects regressions with the full set of bilateral fixed effects (55 in total), and with year dummies. The coefficients must be interpreted slightly differently from those in Tables 4 and 5. Since immigrant-induced displacement effects spill over into ten other regions, the overall effects in Table 6 should be about one tenth the size. When no

¹⁰ Some studies find evidence that spatial inter-dependence between labour markets increases with contiguity and declines with distance, presumably due to migration (see Burgess and Profit, 2001 for evidence on matching functions for UK travel to work areas). In initial experiments, we scaled the explanatory variables by the share of each bilateral flow in total interregional flows over the whole period, so that the coefficients become larger as the degree of association between two regions increases. However, this did not improve the explanatory power of the model. As an alternative, we provide separate estimates for the South of England in Table 7.

other variables are included, the coefficient on the net immigration rate difference is negative but not significant, and its value is less than a tenth of that in Table 4.

When the labour market variables are added in column (2), only the vacancy inflow rate is significant, and unemployment gives the wrong sign. But as in Table 4, adding the level and the change in house prices increases the significance on the labour market variables and changes the sign on the unemployment rate. In column (3) all the variables are significant including the net immigration difference. The displacement coefficient also increases in size. If we multiply by ten to compute the overall displacement effect then this implies that an additional 100 immigrants to a region results in displacement to other regions of 64 individuals.

As before, we investigate the effects for the southern regions alone, where displacement effects are expected to be largest. The estimates in Table 7 are for bilateral flows within the South—15 pairs and therefore 15 fixed effects. As expected the displacement effect coefficients are larger than in Table 6 when all regions were included. But as in Table 6, the coefficient is not significant unless the full set of other variables is included. In column (3) all the variables take the expected signs but the labour market coefficients are weaker than they were when the full set of regions was used. This suggests that labour market conditions may be less important for shorter distance migration. The coefficient on 0.164 on the relative immigration rate implies that an inflow of 100 immigrants into one southern region increases out-migration to the five other southern regions by approximately 82 ($0.164 \times 5 \times 100$). Thus the displacement effects of immigration appear to be large and they spill over mainly into other southern regions.

Conclusion

We have investigated for the UK the hypothesis that net immigration is a determinant of inter-regional migration flows. If there are large displacement effects then this will contribute to understanding why the local labour market effects of immigration seem to be relatively benign. The evidence indicates consistently negative correlations between immigration to one region from abroad and in-migration from other UK regions. Although the effects seem to be large, the precise magnitudes vary across different specifications, ranging from about one third to about

two thirds. Not surprisingly strongest evidence for these displacement effects is for the southern regions where immigration of foreign citizens is most prominent.

These results suggest that inter-regional migration may be an important mechanism through which the British labour market adjusts to immigration. Inter-regional adjustments may also occur through goods markets and capital markets so that the effects of immigration into any one region are spread throughout the economy. One implication of these findings is that even though the effects of immigration on unemployment and earnings in one particular region may be small, this may be a poor guide to their effects on the whole economy. The greater is the degree of inter-regional integration as compared with the degree of international integration, the smaller will be the effects at the local level as compared with those at the national level.

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Table 1
Gross and Net International Migration by Region, 1981-2000
 (Per thousand of the 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	7.11	-4.14	2.96	9.93	-5.88	4.05
Rest of S. East	5.78	-4.04	1.73	6.17	-3.30	2.89
East Anglia	1.73	-1.21	0.52	2.49	-1.37	1.12
South West	1.47	-1.07	0.41	1.76	-1.03	0.74
West Midlands	1.21	-0.72	0.50	2.06	-0.80	1.25
East Midlands	1.00	-0.51	0.49	1.47	-0.87	0.60
Yorks & Humber	1.08	-0.52	0.56	1.87	-0.81	1.06
North West	1.28	-0.65	0.63	1.62	-0.86	0.76
North	0.68	-0.37	0.31	1.18	-0.56	0.56
Wales	0.94	-0.70	0.23	1.32	-0.61	0.71
Scotland	1.31	-1.24	0.07	1.93	-1.24	0.70

Source: Data from the International Passenger Survey supplied by the Office for National Statistics.

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), London: HMSO (1993).

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 data supplied by the Office for National Statistics.

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)	-0.35 (1.6)	-0.29 (1.2)	-0.30 (1.2)
Log vacancy inflow/labour force (t)		0.56 (4.4)	0.36 (3.1)
Log unemployment rate (t)		0.21 (1.8)	-0.22 (1.6)
Log average earnings (t-1)		0.92 (1.0)	1.34 (1.6)
Log house price (t)			-0.83 (3.0)
Δ Log house price (t)			1.36 (4.3)
Adj, R ²	0.86	0.87	0.89
No of observations	209	209	209

Note: 't' statistics in parentheses calculated from robust standard errors. 11 region fixed effects and 19 year dummies are included but not reported.

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)	-0.50 (2.8)	-0.44 (2.3)	-0.43 (2.1)
Log vacancy inflow/labour force (t)		0.43 (2.3)	0.44 (2.3)
Log unemployment rate (t)		0.22 (0.9)	-0.13 (0.3)
Log average earnings (t-1)		1.77 (1.7)	2.78 (2.4)
Log house price (t)			-0.83 (2.2)
Δ Log house price (t)			0.94 (1.7)
Adj, R ²	0.91	0.92	0.92
Hetero ($\chi^2_{(1)}$)	0.00	0.12	0.02
No of observations	114	114	114

Note: ‘t’ statistics in parentheses. 6 region fixed effects and 19 year dummies are included but not reported.

Table 6
Estimates of Bilateral Net Inter-Regional In-Migration Rates, 1982-2000
(Fixed effects panel estimates, 11 regions. 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)	-0.024 (0.9)	-0.041 (1.4)	-0.064 (2.1)
Log vacancy inflow/labour force (<i>i</i> minus <i>j</i> at t)		0.026 (4.6)	0.020 (3.8)
Log unemployment rate (<i>i</i> minus <i>j</i> at t)		0.003 (0.5)	-0.023 (2.6)
Log average earnings (<i>i</i> minus <i>j</i> at t-1)		0.050 (1.2)	0.091 (2.2)
Log house price (<i>i</i> minus <i>j</i> at t)			-0.073 (4.3)
Δ Log house price (<i>i</i> minus <i>j</i> at t)			0.069 (3.7)
Adj, R ²	0.92	0.91	0.93
No of observations	1045	1045	1045

Note: ‘t’ statistics in parentheses calculated from robust standard errors. 55 bilateral region fixed effects and 19 year dummies are included but not reported.

Table 7
Estimates of Bilateral Net Inter-Regional In-Migration Rates, 1982-2000
(Fixed effects panel estimates, 6 southern regions. Dependent variable: inter-regional net migration to i from j)

	(1)	(2)	(3)
Net immigration rate (i minus j at $t-1$)	-0.128 (1.5)	-0.111 (1.3)	-0.164 (2.2)
Log vacancy inflow/labour force (i minus j at t)		0.031 (1.8)	0.028 (1.5)
Log unemployment rate (i minus j at t)		0.013 (0.5)	-0.051 (1.4)
Log average earnings (i minus j at $t-1$)		0.147 (1.4)	0.385 (2.8)
Log house price (i minus j at t)			-0.233 (3.3)
Δ Log house price (i minus j at t)			0.094 (1.0)
Adj, R^2	0.93	0.93	0.93
No of observations	285	285	285

Note: 't' statistics in parentheses calculated from robust standard errors. 15 bilateral region fixed effects and 19 year dummies are included but not reported.

Figure 1
Net Immigration of Foreign Citizens to the UK, 1971-2000

