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Abstract
British cities are becoming more culturally diverse, with migration a main driver. Is this growing diversity good for urban economies? This paper explores, using a new 16-year panel of UK cities. Over time, net migration affects both local labour markets and the wider economy. Average labour market impacts appear neutral. Dynamic effects may be positive on UK-born workers' productivity and wages (via production complementarities for higher skill workers) or negative on employment (if migrants progressively displace lower-skill natives from specific sectors). The results, which survive causality checks, suggest both processes are operating in British cities. Long-term industrial decline and casualisation of entry-level jobs help explain the employment findings.

JEL Classification: D24, J15, J61, O18, R11, R23
Keywords: cities, migration, cultural diversity, labour markets, productivity, urban economics

1. Introduction

This paper looks at the long term economic impacts of migration on British cities. The UK is becoming more ethnically and culturally diverse, with net migration one of the main drivers of change. The past decade and a half represents 'the single biggest wave of immigration in British history' (Goodhart 2010). Many new migrant communities have developed since the late 1990s; A8 accession in 2004 has led to a very large increase in arrivals from Central and Eastern Europe.

These demographic changes have been heavily urbanised. And although many rural communities have seen very rapid growth in numbers of migrant workers, British cities have always had the biggest stocks of migrant (and minority) populations. Put simply, cities are 'where the diversity is', and much of this is migrant-driven. So is the diversity that migrants bring good for urban economies?

There is a large existing literature on the economic impacts of migration in the UK and elsewhere (see Dustmann et al 2008 for a recent summary). Most of these studies focus on the short-term effects of migrants in local or regional labour markets. Studies typically find little or no average impact of migrants on the wages or employment prospects of UK-born (so-called 'native') workers; some turn up welfare losses for less-skilled groups via relative scarcity effects.

Over time, however, migration is also likely to have impacts on the wider urban economy – as migrants settle and new, more diverse communities become established. The dynamic effects of net migration may be productivity-enhancing for natives – for example, if skilled migrants facilitate knowledge spillovers or reduce trade costs (Saxenian 2006, Page 2007). Skilled workers may also have a strong preference for diversity (Florida 2002). This suggests that net migration leads to higher native productivity and wages, employment rates – and local cost of living.

Alternatively, parts of the local economy may become progressively 'migrant-dependent' – specifically, employers in low-cost sectors such as food processing become reliant on cheap migrant labour (Stenning et al 2006). Net migration will impact negatively

on native employment, especially if lower-skilled British-born workers are unable to move into better jobs. If this helps sustain a low-skills equilibrium (Finegold and Soskice 1988), wages and prices may also fall over the long term as the area's economy continues to perform sub-optimally.

These two mechanisms will largely determine the long-term effects of migration on urban economies. Some of this will be captured via changes in wages and employment, but will also show up in productivity and local prices. UK studies usually ignore these wider processes, both in theoretical frameworks and in time periods studied. Furthermore, most studies do not look at how migration and diversity affect 'real' local economies, because they use essentially arbitrary administrative units.

This paper contributes to filling these gaps for the UK, drawing on the pioneering work of Ottaviano and Peri in the US (2007, 2006). Robust time-series data on migration and diversity is very hard to find for British cities. To overcome these limitations, the analysis has several novel features. I assemble a new 16-year panel of urban economies from aggregated microdata. By using 2001 Travel to Work Areas as spatial units, I am able to estimate actual impacts on local economies. I use a Fractionalisation Index to investigate links between migration and changes in UK-born wages, employment rates and local house prices. I am able to explore in detail economic interactions between different skill groups of migrants and natives. The model also allows inference on migrant-related changes in urban labour productivity, exploiting the fact that over time, productivity changes tend to be reflected in wage rates (Combes et al 2005).

The results are robust to various checks and survive instrumental variables regression. They suggest significant long term impacts of net migration on urban economies, within and beyond the labour market. Specifically, the diversity migrants bring helps drive up high skill native productivity and wages, suggesting the presence of both production complementarities and relative scarcity effects. Conversely, increasingly migrant-intensive labour markets appear to be 'locking out' some intermediate and low-skilled British-born workers from employment opportunities. Results from shorter panels suggest that much of this took place since 2000. 'Migrants taking British jobs' is an oversimplification, however: the ongoing impacts of long term industrial decline and the increasing casualisation of entry-level jobs also help explain the employment findings.

The paper is structured as follows. The next Section explores the background and policy context, and sets out key definitions and terms. Section Three reviews the UK and international evidence. Sections Four and Five introduce the main datasets, and estimation strategy. Section Six presents the main results. Section Seven runs through robustness checks and presents IV results. Section Eight concludes.

2. Background and motivation

My research question is: what are the long-term effects, if any, of migration on the economic performance of British cities?

I focus on the diversity that migrants bring to urban populations and workforces. Both 'migration' and 'diversity' need careful definition. My analysis concentrates on 'long term migrants' – those people born outside the UK and resident in the country for at least 12 months (HO / DWP 2007). Most public datasets, including the LFS, do not identify 'short term migrants' who may only stay for a few months.

I use changes in urban migrant populations as a way of exploring broader questions about the local economic impacts of cultural diversity. There are some important limits to this approach. Cultural (or 'ethnic') diversity is a multifaceted concept that is at least partially subjective (ONS 2003, Bellini et al 2008). Therefore most attempts to quantify diversity are imperfect, especially reductions to a single dimension (such as language, religion or country of birth) (Mateos et al 2007). Nevertheless, in the absence of reliable multidimensional indicators, country of birth is widely used as a proxy for 'diversity as a whole' – because it is objective, and because rich data is available.

There are several reasons to be interested in the economics of migration, particularly at urban level.[1] Long term migration flows into the UK are relatively small – between 1971 and 2006 the UK population grew by 8.2%, while the US population grew by 44.6%, with migration the main driver in both cases (Blanchflower 2007).

[1] The focus of this paper is on migration in cities, which I will also refer to as 'urban areas' or 'local economies'. In the analysis I will approximate cities using UK 2001 Travel to Work Areas (TTWAs).

Since the late 1990s, however, 'netflows' to the UK have accelerated substantially. From just under 50,000 people per year in 1997, net annual migration rose to around 140,000 in 1999, and rose again in 2004/5 to over 200,000, when a number of East European countries joined the EU (Graph 1).[2] Just before the downturn the net inflow of migrants to the UK was around 198,000 people per year. The diversity of migrant flows to the UK has also expanded dramatically (Kyambi 2005).

As a result, there are now high levels of interest in the impacts of migration on the economy, society and public services. Since 2003, 'race and immigration' has been one of the top three issues in MORI's monthly omnibus surveys of public opinion. There have been four major re-organisations of immigration policy since 2001, and a continuing political debate about the merits or otherwise of capping non-EU migration (Somerville 2007).

There is now also an ongoing conversation about the wider effects of a bigger, more diverse society (Wolf 2008, Goodhart 2004, Simpson and Finney 2008). This reflects the fact that growing cultural diversity in Britain and many other Western societies is also driven partly by migrant communities (Putnam 2007, Champion 2006). In 2007 UK net immigration accounted for 52 percent of overall population growth, with 'natural change' (net births) explaining the rest (Graph 1). But natural change includes a rising share of live births to mothers born outside Britain (ONS 2008). This reflects higher net migration and differential birth rates in some minority groups (PIU 2003).

Migrants are unevenly distributed across the UK. Since 2004, rural areas and small towns have experienced very rapid growth in migrant populations (Green et al 2007, Bassere et al 2007). However, British cities still contain the largest migrant volumes and population shares. In 2002-3, over half of all net migration was to London, and over half of the rest was to other large cities (Table 1). The urban share of both migrant groups and visible minorities has been increasing over the past decade and a half. Put simply, cities are 'where the diversity is', and much of this is migrant-driven.

In England alone, the 56 biggest urban areas contain over half the UK population and over two thirds of all employment (Parkinson et al 2006). So any migrant-related changes to

[2] ONS Total International Migration (TIM) figures. These will include some British return migrants.

the economic performance of British cities might also impact on national economic trends. According to some commentators these impacts could be substantial. In recent years a number of authors have suggested that there are significant economic gains from migration, and that cities help drive these gains (Leadbeater 2008, Legrain 2006, Florida 2002). These arguments are reviewed in the next section of the paper.

3. Review of theory and evidence

Changes in net migration affect urban economies by altering the size and composition of the urban population and labour force. These are discussed below, and summarised at the end of this section. I distinguish between labour market change, and dynamic processes affecting the wider urban economy.

3.1 Labour market impacts

The simplest migrant-related change to an urban economy is a one-off labour supply shock. Its impact depends critically on whether migrants are perfectly substitutable for UK-born workers (or 'natives'). If there is perfect substitution, a one-off 'migrant shock' leads average native wages to fall. If wages are sticky, native employment may fall too. Typically migrants cluster at the bottom end of the labour market, so that the main effect is on low skilled natives via labour market competition. Higher-skill natives receive wage gains through relative scarcity effects (Dustmann et al 2007, Card 2005). Output composition then shifts towards migrant-intensive sectors, bidding overall wages and employment rates back up. The end effect is neutral on average outcomes, although low-skilled natives may experience temporary wage or job falls (Dustmann et al 2003).

If migrants are not perfect substitutes with natives, they may cluster in 'hard to fill' jobs at the bottom of the labour market (Manacorda et al 2006). This means competition with natives is minimal; we should see little change on native wages and employment, particularly if new migrants predominantly compete with existing migrant groups. (If employers react to repeated inflows by changing production functions and/or hiring patterns, impacts on natives may be more significant – see below.)

A large number of empirical studies in the UK and elsewhere bear out these predictions, finding little or no significant effects of migration on average native wages, employment or unemployment. Some studies suggest small welfare losses for lower-skilled natives and gains for higher-skilled groups (see Dustmann et al 2008 and Nathan 2008b for recent reviews). Importantly, studies suggest that although migrants have similar skills profiles to natives and can be found across the occupational spectrum, they do not behave as perfect substitutes, particularly in the first few years of residence in the UK (Dustmann et al 2007, Green et al 2007).

3.2 Wider economy impacts

Net migration is also likely to have effects on the wider urban economy, particularly over longer timeframes as migrant communities are established. First, migration may progressively raise the productivity of UK-born workers by facilitating market access, knowledge creation and diffusion. Second, low value-added sectors of the local economy may become increasingly migrant-dependent. Native workers may be able to move up the jobs hierarchy; if not, they become disconnected from work.

The first channel is likely to raise native productivity and wages, employment and prices. In the second case, outcomes are ambiguous. In both cases, welfare gains from migration are likely to accrue to higher-skilled British-born, with losses accruing to lower-skilled native workers.

3.3 Migration and productivity

Net migration can enhance labour productivity in various ways, particularly in urban environments. Endogenous growth theory highlights the importance of knowledge and human capital to long run economic development (Romer 1990). Migrants play potentially important roles in knowledge creation, both as mobile carriers of human capital and by influencing ideas generation and diffusion. A number of lab and workforce studies suggest that 'cognitive diversity' in teams – a range of experiences and perspectives – helps problem-solving and can foster innovation. Cultural diversity is an important component: workforce diversity may be hard to manage initially, but tends to improve team performance over time

(Page 2007, Landry and Wood 2008). These effects tend to be greatest in 'knowledge-intensive' sectors, which are largely concentrated in and around cities.

Migrant diasporas may also improve forward and backward linkages for firms – both through access to new customer markets, and via increased possibilities for distributed / off-shored production (Saxenian 2006). Again, these effects are likely to be urbanised, as cities both have the highest levels of physical connectivity and large, diverse consumer markets.

By raising the productivity of 'knowledge-intensive' businesses and workers, these processes are also likely to raise wages and employment rates for the higher-skilled staff these firms typically employ. If productivity-enhancing effects are large enough they also may contribute to overall urban growth (Ottaviano and Peri 2007). As per spatial economy models, average wages and employment rates will rise, reflecting increased productivity. But as internal and international in-migration accelerates, pressures on space raise local living costs (Combes et al 2005, Overman and Rice 2008).

US evidence suggests that migration shifts are linked to both productivity and price gains in American cities, so that real welfare effects are close to neutral (Ottaviano and Peri 2007 and 2006, Sparber 2006, Saiz 2003). Concentrations of migrant inventors make a difference to levels of urban innovation (Hunt 2008, Peri 2007, Saxenian 2002). Migrant networks also facilitate international links and reduce trade costs (Peri and Requena 2009, Saxenian 2006). There is almost no comparable analysis for the UK – although see Frattini 2008 (on migration and regional prices), Bellini et al 2008 (analysis of EU regions) and Südekum et al 2009 (German regions).

An alternative view is suggested by Richard Florida (2002). In this model, urban economies are increasingly dominated by a 'Creative Class' of skilled workers with strong preferences for cultural diversity. Open and tolerant cities attract the Creative Class, improving their human capital mix and attracting new investment. This implies that diverse cities might have stronger economic performance primarily because of the Creative Class, with cultural diversity contributing nothing directly. In practice, the Creative Class performs poorly in both US (Glaeser 2005) and UK contexts (Nathan 2008a). Significantly, there is little UK evidence that a single 'Creative Class' exists – skilled workers have a range of location preferences covering city centres, suburbs and rural locations (Nathan ibid).

3.4 Migration and dynamic labour market change

Over time, the structural labour market impacts of net migration may differ from the short term effects described above. New migrants tend to cluster in occupations that are unattractive to UK-born workers (Manacorda et al 2006). Against a backdrop of rising net migration, the effect is a permanent rise in migrant' share of the entry-level workforce.

Employers may react to this in one or both of two ways. First, in urban areas with large numbers of entry-level positions, employers of low-wage labour may switch hiring patterns to take advantage of a constant flow of cheap, motivated workers (Stenning et al 2006). Some sectors of the local economy – such as food processing, routine manufacturing or low-cost retail – may become progressively 'migrant-intensive' or 'migrant-dependent' (Green et al 2007). Second, firms in other sectors may adopt more labour-intensive production functions. They may then fill new posts using migrant labour, particularly if the new jobs are of poor quality and unattractive to native workers.

If migrants increasingly provide the main source of entry level labour, UK-born low-skill workers may then be able to move up the occupational hierarchy. The extent of this 'bumping up' critically depends on the quality of available education and ongoing vocational training, and on whether employers increase their demand for skilled labour. If low-skilled natives are bumped up, migration will leave their employment rates unaffected but their wages will increase. If natives are unable to move into better jobs, however, the dynamic effect of migration will be to bid down low-skill natives' employment rates. They will be unwilling to fill low-paid, insecure positions; migrants will dominate employment flows. Labour market competition becomes 'lockout'. At urban level, average wages and employment rates may fall in places where low value-added sectors dominate. As the area's economic trajectory turns downward, prices fall too.

There is some suggestive UK evidence to support this. Since the mid-1970s, technological and institutional changes have contributed to wage inequality and job polarisation, with rising employment shares for high-skilled 'knowledge' jobs and the least-skilled manual occupations (Goos and Manning 2007). This helps explain persistent spatial disparities in many urban areas, which have lost 'middling' jobs and seen the share of manual jobs increase. Some of these places have also seen large increases in net migration. In some

parts of the country (such as the North East) food processing and manufacturing firms are becoming dependent on the 'quick fix' of migrant labour (Dawley and Stenning 2008, Fitzgerald 2007, Green et al 2007). These shifts are often facilitated by temporary employment agencies (Coe et al 2006).

There are also difficulties for low-skilled workers looking to move up the occupational ladder. Critics point to persistent problems in the UK adult skills system (Westwood and Jones 2004). Most famously, Finegold and Soskice (1988) suggest some sectors of the UK economy are in 'low-skills equilibrium': employers operate low-cost, low-quality business models and show little interest in changing task skill composition or raising human capital.

4. Data and descriptives

In order to examine potential effects of migration on urban economies, I construct a new panel of UK urban areas, from 1994-2008 inclusive. (For robustness tests, I also create two shorter panels covering 2000-2008 and 1994-1999 inclusive.)

The main dataset in this analysis is the British Labour Force Survey (LFS): this is the single best source of long term data on migration, demographic and economic data, but the relatively small survey size raises the risk of measurement error when used at local level (Dustmann et al 2003). I am using the LFS at sub-regional level, which requires safeguarding against biased estimates. I therefore use LFS microdata[3] to construct a panel of Travel to Work Areas (2001 TTWAs), using a postcode share weighting system to aggregate local authority-level averages.[4] TTWAs have the additional benefits of being designed to represent

[3] From the ONS Virtual Microdata Lab (VML). The quarterly LFS samples around 60,000 households. Each quarter consists of five overlapping 'waves', with an 80% overlap within that quarter. As per ONS recommendations, to ensure a sample of unique individuals I keep only observations from waves 1 and 5 in each quarter. I then pool the remaining data to produce calendar years. This approach gives me c.120000 individual-level observations per year, approximately 517 per TTWA. This will be considerably higher for both total and migrant sample in the final panel, which is restricted to urban areas only.

[4] I aggregate individual-level data to local authority-level averages, and then aggregate these to TTWA-level using postcode shares. Local Authority District (LAD) boundaries are not congruent with TTWA boundaries, so straightforward aggregation is not possible. Using the

self-contained local labour markets, act as good proxies for a spatial economy, and minimise the risk of spatial autocorrelation. To further strengthen the analysis I restrict the analysis to 79 'primary urban' TTWAs where the sample sizes are biggest. As a final safety measure I pool years together and estimate in long differences, averaging observations across two years (for short panels) and three years (long panels).

The resulting panels draw on LFS data (for wages, employment, migration and most controls) alongside Land Registry microdata (for house prices) and ONS mid-year population estimates (for controls and robustness checks). I restrict observations to the LFS working age population (16-64 for men, 16-59 for women), and for simplicity drop observations from Northern Ireland. I have 1185 observations in the long panel (1994-2008). At the time of modelling Land Registry data was only available for 1995-2006 inclusive, so house price data panels cover 1995-2006. I then pool across years, giving me 158 averaged observations (148 for house price models).

4.1 Measures of migrant diversity

To get the most value from country of birth information I develop several different measures of local migrant populations. In common with most studies I use simple population shares to measure the stock of migrants. I also construct a Fractionalisation Index of country of birth groups. Following Ottaviano and Peri (2006), this captures the cultural diversity migrants bring to urban economies. For group *i* in area *c* in year *t*, the Index is given by:

$$FRAC_{ict} = 1 - \sum_i [SHARE_{ict}]^2 \qquad (1)$$

Where SHARE is *i*'s share of the total area population. The Index measures the probability that two individuals in an area come from different country of birth groups. Similar measures

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November 2008 National Postcode Sector Database (NSPD), I calculate the number of postcodes in each 2001 TTWA and in each of its constituent LADs. For each TTWA, I then calculate constituent LADs' 'postcode shares'. Shares sum to one, and are used as weights to construct TTWA-level averages. *Example:* suppose a TTWA consists of parts of three LADs. The TTWA has 100 postcodes, 60 of which are in LAD_a, 30 in LAD_b and 10 in LAD_c. The relevant LAD weights are 0.6, 0.3 and 0.1 respectively. The TTWA-level average of variable x is given by $(x)\text{TTWA} = 0.6*(x)\_a + 0.3*(x)\_b + 0.1*(x)\_c$.

are used widely in the development literature, as well as some US city and state-level studies (Easterley and Levine 1997, Alesina and La Ferrara 2004).

I estimate the Index using 79 individual country of birth groups, including UK-born, and construct separate Indices for high, intermediate and low skilled workers. The Index reflects both the number of different groups in an area and their relative sizes. Specifically, it takes the value 0 when everyone is in the same country of birth group and 1 when each individual is in a different group; it takes the value 1-1/*c* when *c* groups are of equal size.[5] The Index therefore is my primary measure of diversity, although for comparison I also show some results using population shares and run cross-checks using other measures.[6]

4.2 Descriptives

Summary statistics for the long panel are set out in Table 2. Wages, employment rates and economic activity are similar between British-born and migrant workers, although migrants have slightly higher average wages and slightly lower employment rates (thus slightly higher unemployment rates). Figures for ethnic minorities are included here for comparison – focusing on 'visible minorities', they highlight below-average labour market performance.

I create three skill groups based on qualifications obtained, using the UK NVQ system as a benchmark. 'High skill' workers have qualifications at NVQ4 level or above (equivalent to a university degree or other Higher Education qualification); 'intermediate skill' workers obtain NVQ3 or 2 (equivalent to A-levels or at least five GCSE's at grades A*-C, respectively); 'low skill' workers obtain NVQ1, equivalent to other/no qualifications. Table 2 shows that high skill workers comprise just over a fifth of the sample, intermediate skill workers over two-fifths and low-skill workers a third.

Tables 3 and 4 provide more detail on natives and migrants by skillgroup. Compared to the UK average and to residents, migrants are slightly over-represented in the most and

[5] In this research I am using an Index based on 79 country of birth groups. If these are of equal size, the maximum value of the Index will be (1 – 1/79) = 0.99 (to 2dp). In practice the maximum Index is often 1 due to approximation in the aggregation process.

[6] Specifically, I also run regressions using 1) migrant population shares from 'Northern' and 'Southern' countries, where 'North' is defined as EU25, North America, Japan and Australasia 2) a simple Fractionalisation Index using 18 country of birth groups. For 1) results were largely insignificant on native wages and employment. For 2) results were very similar to the full Fractionalisation Index.

least-skilled groups (table 3). As a cross-check, the table also breaks down occupational groups. Here, migrants are under-represented in 'intermediate' occupational groups such as administration and skilled trades, but have similar-to-native shares in other groups. In line with other studies, this suggests some bunching of migrants in occupations in which they are technically overqualified. Table 4 breaks down wages, employment and unemployment rates by skill group, for both the whole sample and the UK born. As expected, wages and employment rates rise with human capital, while unemployment rates decline.

Across the panel, average levels of migrant working-age population share and migrant diversity are fairly low. As expected, London accounts for the maximum values of wages, house prices and diversity. Maxima and minima show that even within the set of urban areas, migrant communities are heavily clustered in a few places, with a long tail of much less diverse locations.

However, migrant communities have grown significantly over time, and the set of diverse cities has also changed over the period of study (Table 5). Between 1994 and 2008 the average value of the Fractionalisation Index rose by around 10 percentage points, from just under 0.1 to just under 0.2, and average migrant working-age population shares increased from six to just over 10 per cent. While London has the biggest migrant stocks throughout the panel period, the UK's stock of urban diversity has increasingly shifted into the Greater South East. In the table, the Northern cities' stock of migrants has grown but has lagged behind stock changes further south.

The composition of migrant communities has also changed over the past two decades, a process documented in detail by Kyambi (2005). Table 6 shows that a number of new migrant communities have appeared over the study period – in particular from Poland, the former USSR, Zimbabwe, China, Hong Kong and South East Asia.[7]

[7] To ensure comparability over time, country of birth groups are calculated with reference to LFS CRYO categories for 1992. This variable aggregates some countries (e.g. Yugoslavia) and does not take full account of more recent geopolitical changes (e.g. collapse of USSR, expansion of the EU).

5. Estimation strategy

I construct a simple model, linking urban economic outcomes to diversity and a range of demographic, economic and spatial controls. My estimation strategy is an example of the spatial correlations approach widely used in the migration and diversity literature (e.g. Card 2005, Dustmann et al 2005, Ottaviano and Peri 2006). The basic model is given by:

$$Y_{it} = bDIV_{it} + \boldsymbol{DEM}_{it}c + \boldsymbol{ECON}_{it}d + eSPAT_{it} + \mu_t + \partial_i + e \qquad (2)$$

Where Y is variously the log of average hourly wages for UK-born residents ('resident wages'), log average employment rate for UK-born ('resident employment') and the log of average house prices ('prices'), which I use as a proxy for the local cost of living. Wages and employment rates are also broken down by skill group, as above. Productivity gains in urban areas are typically reflected in higher long term wages (Combes et al 2005). So this specification allows me to interpret wage changes as shifts in labour productivity.

DIV is my variable of interest, measured by the Fractionalisation Index of 79 country of birth groups and the Indices of each skillgroup (for comparison, I also present OLS results using simpler population shares as an alternative measure of *DIV*).

DEM represents a set of demographic controls (share of workers 24 and under, share of female workers). Both of these should be negatively correlated with wages. The youth measure is likely to be negatively related to employment, although the share of female workers may be positively linked.

ECON is a set of economic structure controls (share of workers with degrees, share of workers in manufacturing sectors, share of jobless who are long term unemployed). The first of these should be positively related to wages, employment and prices. The second should be positively related to employment rates. The third should be negatively related to wages, prices and employment (in particular).

SPAT is given by logged population density, measured as total population over surface area. This is a simple device for capturing agglomeration economies, and is likely to

have a positive relationship with wages and prices, and an ambiguous relationship with employment rates. μ_t and ∂_i denote time dummies and area fixed effects, respectively.

I estimate in long differences, using moving averages to minimise measurement error. Specifically, for the long panel I use averages of 1994/6 and 2006/8, and for the short panels, 1994/5-1998/9 and 2000/1-2007/8. Hausman tests suggest a fixed effects specification is preferred. For the main results I therefore estimate the model as a two-period model in Stata (using xtreg with area fixed effects and year dummies). This is equivalent to estimating in first differences.

Initial diagnostics suggest a small number of observations with large residuals in one or more of the key years. I run regressions with and without the five largest outliers as a simple robustness check.[8] London represents the biggest outlier and the majority of leverage points, so I also run models with and without the capital.

There are a number of potential validity challenges here, in particular the issue of majority outflows (Borjas 1994) and migrant selection (Altonji and Card 2001, Borjas 1994). I deal with the former in robustness tests, and the latter through a shift-share instrument based on Ottaviano and Peri (2006). See Section Seven for further details.

6. Main results

The results from the main regressions are set out in Tables 7 through 13. Tables 7, 9 and 11 give results where *DIV* is measured using the Fractionalisation Index of country of birth. For comparison, Tables 8, 10 and 12 use migrant population shares. Table 13 breaks down results by skillgroup cells.

In each of the main tables specifications (1) to (6) give results for the full sample. Of these, (1)-(3) show simple results with year dummies, (4) gives controls, year dummies and area fixed effects, and (5) and (6) give results for the full model with and without London.

[8] The five outliers are London, Birmingham, Dudley and Sandwell, Swansea Bay and Tunbridge Wells.

Specifications (7) through (12) show results for high, intermediate and low-skill British-born workers, with and without London.

Overall, the model performs well. Before area fixed effects are applied, R^2 for controls is 0.938 in wage models, 0.636 in employment models and 0.938 for prices. F-statistics are also large, particularly for wage and price models. Controls are generally of the expected sign and magnitude. The model is parsimonious: omitted variable bias is minimised by fitting area fixed effects and year dummies: on a two-period model this is a strong specification that will remove much of the variation from the sample.

6.1 Results from whole sample

There are positive associations between migrant diversity and native productivity / wages. As measured by the Fractionalisation Index, *DIV* is 0.322, significant at 5%. This implies that a 10 point rise in the Index, the average change over the panel period, is associated with a [(0.1*0.322)*100] = 3.22% rise in UK-born workers' productivity / wages. For migrant population share *DIV* is 0.484, also significant at 5%. A one percentage-point rise in migrant population share is associated with a [(0.01 x 0.484]*100] = 0.484% rise in resident average productivity / wages: a five percentage-point rise, just over the average change in migrant population shares from 1994 through 2008, is associated with a 2.42% rise.

In contrast, employment models consistently show a negative association between migrants and UK-born average employment rates. For the Fractionalisation Index, the coefficient of *DIV* is -0.228; for migrant population share, it is -0.403. Both are significant at 5%. The first result implies that a 10 point rise in the Index is associated with a [(0.1*0.228)*100] = 2.28% fall in resident employment rates.

The house price models show no significant relationship between *DIV* and the local cost of living, as measured by average house prices. In part, this is likely to be driven by the choice of dependent variable. The UK lacks robust cost of living data at sub-regional level, and even regional-level data is very hard to obtain (Frattini 2008). I use house price data as a proxy for the local cost of living, which is less than ideal. First, including mortgage costs housing-related expenditure is the single largest item of UK consumer spending, covering 22 percent of spend (ONS 2008). However, three quarters of spending is not covered. Second,

most migrants tend to rent rather than buy, so that some of the direct impacts of migrants on local housing markets will probably not show up in sales figures (Gordon et al 2007).

I run two basic robustness checks at this stage. First, removing London from the sample makes some difference to the results, although less than one might expect. Removing the capital slightly raises the coefficient of *frac* on native productivity / wage rates, from 0.322 to 0.339, and slightly lowers the effect on employment rates, from -0.228 to -0.223. Significance levels remain unchanged. Second, I run the regressions without the five main outliers. Results are not reported here, but are not substantially different: coefficients of *DIV* are slightly smaller and significance levels fall to 10%.

6.2 Results by skill group

For productivity/wage and employment models, Tables 7 – 12 also provide headline results for high skill, intermediate skill and low skill workers. For the former, results are as predicted, with *DIV* positive for higher skilled workers and slightly negative for low skilled workers. However, *DIV* is not significant in any specification.[9] For employment models, *DIV* is negative for all worker groups. However, the association is only significant for intermediate and low skilled workers, where the coefficients of *DIV* are -0.292 and -0.497, significant at 5% and 1% respectively. Removing London and outliers makes little difference to most results, although in the former case the association of *DIV* on low skill natives' productivity/wages moves from -0.162 to 0.026 (and close to zero for migrant population share).

To further investigate transmission channels, I disaggregate *DIV* into human capital groups, and regress on productivity/wages and employment rates of every native skill group. This allows me to look at how the diversity of different skillgroups may affect outcomes for natives. Specifically, I can check for potential production complementarities between similar groups, and lockout and bumping up between different groups.

[9] This is partly explained by collinearity between the dependent variable and the human capital control, especially for high skill natives' wages. When the latter is removed, *DIV* is weakly significant (at 10%) on productivity / wages. Employment results are unaffected.

Findings are summarised in Table 13. Productivity/wage results are in the first panel, employment results in the second panel. For high and intermediate skilled workers, changes in *DIV* have little link to native group outcomes. However, the diversity of intermediate skilled workers has a significant association with productivity/wages of low-skilled natives. The diversity of low-skilled workers has significant positive associations with the wages of all UK-born worker types: but significant negative links to the employment rates of lower-skilled natives.

These findings suggest that low-skilled migration is good for the productivity / wages of most UK-born workers, and are compatible with both 'bumping up' and production complementarities. But intermediate and low-skill natives may also be locked out of some employment by changes in migration: productivity gains may also allow some firms to reduce headcounts.[10]

7. Robustness tests

Section Five highlights two main endogeneity problems with the estimation strategy, native outflows and migrant selection. I deal with each of these in turn.

7.1 Native outflows

The UK-born population in a given area may respond to immigrants arriving by leaving that area – because they are displaced in the labour market, because of more expensive housing, or because they dislike diversity. If this occurs any economic impacts of the migration shock may not be picked up by a spatial correlations approach, and coefficients of *DIV* will be biased towards zero (Borjas 1994).

There is no consensus on the extent of native outflows, either internationally or in the UK (Borjas 1994, Card 2007 and 2005, Dustmann et al 2008). As Dustmann and colleagues point out, levels of internal migration in the UK are relatively low compared to the US, and

[10] An alternative explanation of these results is that they simply reflect relative scarcity and competition channels in the labour market. This is not incompatible with the previous analysis (see final section).

low-income groups are particularly unlikely to move. Gordon and colleagues suggest that migrants' willingness to live at high housing densities mitigates pressures on urban housing supply (Gordon et al 2007).

In tests, Lemos and Portes (2008) find no effect of migrants' arrival on native 'netflows'. By contrast, Hatton and Tani (2005) suggest outflows are quite large, especially in the Greater South East. More broadly, there is little evidence of 'white flight' in the UK. In 2005 Trevor Phillips – head of the Equalities and Human Rights Commission – warned that Britain was 'sleepwalking into segregation'.[11] But the evidence shows very little *spatial* segregation in British communities (Simpson and Finney 2009).[12]

I conduct two simple checks for native outflows. The first is based on a test developed by Card (2005). Assuming migrants tend to compete with lower-skilled natives, Card regresses the share of all low-skilled workers on the share of low-skilled migrants:

$$LOWSKILL_{it} = a + bLOWSKILLMIG_{it} + e_{it} \qquad (3)$$

If migrants completely displace natives, b should be 0 or close to it. Conversely, if there is no displacement b should approach the value 1. I run the test with and without area and year fixed effects. Results are shown in Table 14. The OLS results suggest native outflows are quite large: however, the model has little explanatory power. Once fixed effects and year dummies are introduced, the relationship becomes insignificant.

I also develop a very simple internal migration model, regressing the log population share of British-born workers on the logs of wages, house prices, employment rates and the share of long term unemployed, plus migrant population share. Results are shown in Table 15. While there is a negative association between migrant stock and the population share of British-born, other factors appear to play a larger role. Neither of these tests establishes a causal relationship for native outflows. And coefficient size suggests that outflows only explain a small part of the main results.

[11] http://news.bbc.co.uk/1/hi/uk/4270010.stm accessed 3 September 2009.
[12] Although there is some evidence that increasing parental choice in education has led to some largely white or non-white schools (ibid).

7.2 Migrant selection and instruments

A more serious issue is migrant selection. If migrants are attracted to the cities with the highest economic performance, the best-performing place may also be the most diverse even if there is no causal relationship. This will bias coefficients of *DIV* upwards. Equally, if migrants are located in cities that suffer exogenous, negative economic shocks, *DIV* will be biased downwards if the shock is not controlled for.

An instrumental variables strategy is needed to deal with this. A number of potential instruments have been developed in the literature. Time lags are the simplest approach (see e.g. Dustmann et al 2005) but are hard to interpret in a spatial economy framework. Accessibility measures have also been used, based on the fact that migrants tend to settle in and around major entry points such as ports and land borders (Ottaviano and Peri 2006, Bellini et al 2008). Unfortunately, the geography of the UK makes it difficult to apply these instruments successfully: there are no land borders, and many key entry points are regional airports close to several urban cores, making it hard to link migrant flows to specific local communities.[13] Some studies have also exploited recent policy shocks, such as the natural experiment created by A8 accession in 2004 (Lemos and Portes 2008). However, it is hard to see how accession could be used to construct an instrument for the much longer time period studied here. Also, compared to many other countries the UK has made relatively few policy changes that have significantly changed migrant flows (Ortega and Peri 2009).

I therefore construct a shift-share instrument of the kind popularised by Card (Altonji and Card 2001, Card 2005, Card 2007). The intuition is that migrant populations tend to be attracted to existing migrant communities. Using local historical population data, the instrument ascribes a share of each country of birth group's national population share, for each TTWA and year in the panel. In this way it removes the effect of local demand shocks that might affect migration flows.

[13] Lemos and Portes (2008) experiment with an instrument based on regional airports, numbers of flights and distance from airport to home countries. This performs poorly for the reasons above, and probably because their period of study (2004-2006) also saw considerable dispersal of migrants around the UK.

The specific instrument used here is based on Ottaviano and Peri (2006). Let COB_{ict} denote the share of the total population accounted for country of birth group *i*, in city *c* and year *t.* Then COB_{it} is the corresponding national share of group *i*, summed across cities. *tbase* denotes a base year. Then the predicted population share of *i* is given by:

$$predCOB_{ict} = COB_{ictbase} + [COB_{ictbase} * (G_{i(t\text{-}tbase)}) \quad] \tag{4}$$

Where

$$G_{i(t\text{-}tbase)} = (COB_{it} - COB_{itbase}) / COB_{ictbase} \tag{5}$$

The predicted migrant population share is calculated by summing $predCOB_{ict}$ across country of birth groups *i*. The predicted Fractionalisation Index is given by:

$$predFRAC_{ct} = 1 - \sum_i (predCOB_{ict})^2 \tag{6}$$

I set 1991 as the base year, using 1991 Census data to exploit the 100% sample.

There are two other potential challenges for shift-share instruments. First, patterns of historic migrant settlement may be influenced by historical factors that also shape current economic outcomes. This weakness can be minimised by choosing a suitable base year.[14] The second problem is that local demand shocks within the panel might have an impact on national migrant stocks (for example, a construction boom in London during the late 1990s). This weakness is harder to deal with, although in theory one could do so by generating predicted national migrant stocks – using a country-level model of international migration flows, for instance. Ortega and Peri (2009) offer one such model, but it is not applied to generate sub-national numbers.

[14] One might also argue that the instrument does not take proper account of individual expectations of an area's future economic performance (based on past performance and /or emerging growth sectors). Thanks to Deepak Hegde for this point.

7.3 Results from IV regressions

Results from IV regressions on the Fractionalisation Index in Tables 16 to 18.[15] In each case model (2) gives results for the panel without London. First stage results show that the instrument is a good predictor of *DIV* with an F-statistic of between 21 and 29 and partial R^2 between 0.29 and 0.33. The instrument also survives Kleibergen-Paap tests for under- and weak identification, and passes the Stock-Yogo weak instruments test at 5%.

In the full sample, the positive effect of *DIV* on resident wages disappears in the IV results. The negative association between *DIV* and resident employment remains and is significant at 1%. Coefficients of *DIV* are now much larger (-0.718 for the Fractionalisation Index and -0.942 for migrant population share). As in the main regressions, *DIV* is not significant on average house prices.

Removing London make little difference to the results. Removing the five outliers slightly reduces coefficients of *DIV* on productivity/wages and slightly raises coefficients of *DIV* on employment. Significance levels are unchanged.

7.4 Results by skill group

Unfortunately data limitations restrict the analysis to regressing means of *DIV* on native skillgroups, rather than running regressions across all skillgroup cells. For productivity/wages, *DIV* is positive for high and intermediate skill workers and negative for low skilled natives. For the former, *DIV* is 0.660, significant at 10%, and stronger when measured by population share (Table 16). In the employment results (Table 17), *DIV* is negative for all three groups. For high-skill natives the result is marginal (p-value = 0.073), but stronger for intermediate skilled workers (-0.560, significant at 1%) and low skilled workers (-0.567, significant at 10%). Again, removing London and outliers does not change the substantive findings.

[15] Results are generated using xtivreg2. Schaffer, M.E. (2007). xtivreg2: Stata module to perform extended IV/2SLS, GMM and AC/HAC, LIML and k-class regression for panel data models. http://ideas.repec.org/c/boc/bocode/s456501.html.

The instrument is not perfect, so is likely to inflate coefficients and standard errors of *DIV*. Conversely, by eliminating reverse causation it should give a truer picture (Südekum et al 2009). Overall, results suggest that the dynamic impacts of migration are not uniform. Any positive impacts on productivity/wages are driven by gains for skilled workers, while negative employment effects seem to be driven by losses for intermediate or lower-skilled groups. We can see that the 'London effect' also differs by worker type. Employment results suggest that while intermediate skill workers in London are slightly better off, low skilled workers in the capital are slightly worse off (although the latter result is only marginally significant).

8. Discussion

This paper has considered the long term effects of migration on a panel of UK cities between 1994 and 2008. Over this period the UK, and urban areas in particular, have become significantly more culturally diverse, with migration a main drivers of change. Migration may have distinctive economic impacts in cities, as opposed to the UK as a whole. Investigating this is difficult for the UK. Unlike the bulk of British studies I have been able to look at impacts beyond the labour market, and at the level of the real urban spatial economy. The trade-off is that the data is pushed very hard, but the estimation strategy adopts a number of safeguards to minimise measurement error.

The results imply there are significant dynamic effects of net migration on UK urban areas, over and above labour market change. First, there is some evidence that migration helps drive up native productivity and wages, particularly for high-skill UK-born workers. Second, more migrant-intensive economies may have a lockout effect on some lower-skilled natives, although others may be 'bumped up' the occupational hierarchy. Third, net migration appears to have no effect on average house prices at the urban level. All of these results are robust to various checks and survive instrumental variables regression, although productivity/wage findings are conditioned by the instrument.

The paper proposes two main mechanisms by which net migration might change urban economic outcomes over the long term: production complementarities, particularly

among skilled workers, and structural change to entry level employment, concentrated on lower skilled workers. The empirical results suggest that both of these mechanisms are operating in UK urban areas. Productivity and wage gains largely accrue to skilled workers, although lower-skilled natives also gain; while employment pressure is largely felt by intermediate and low-skilled workers.[16]

An alternative explanation is that all this simply reflects relative scarcity and competition effects in the labour market. Results from skillgroup cells suggest that both are at least part of the answer. To test whether the results 'collapse to the labour market', I break the panel into shorter periods, covering 1994-1999 and 2000-2008. Unreported results from the shorter panels find no statistically significant changes to average productivity/wages, or to particular worker types. In turn, this suggests that these results from the main panel are the result of longer term shifts in urban economies and firms, rather than simple labour market effects. Conversely, I also find significant negative associations of migration and resident employment rates in the period 2000-2008. This suggests the very large increase in net migration during the 2000s partly drives the main employment results. This is intuitively plausible, and the results are replicated in IV regressions. However, the instrument is now much weaker so it is hard to ascribe causality.

Overall, these findings are less clear-cut than similar studies in the US (Ottaviano and Peri 2006) and Germany (Südekum et al 2009). Nevertheless, they help explain some of the current public conversation about migration and diversity in the UK. Net migration is good for high skilled workers, employers and Government, which receives migrants' taxes but typically spends less on healthcare or education (Sriskandarajah et al 2005). On the face of it, outcomes seem to be less good for less skilled British-born workers. However, the reality is likely to be more complex. First, across the UK new migrants compete against previous migrant cohorts as well as natives (Manacorda et al 2006). I run separate robustness checks to confirm this, comparing the main results with outcomes for all workers, including existing migrants. Second, the employment results need to be put in the broader context of industrial decline and the restructuring of entry-level work in many urban labour markets.

[16] A striking feature of the employment results is that the effects of migration appear to be strongest for intermediate skill British-born workers rather than for low skill natives. This is probably explained by the urban focus, which does not capture the large numbers of migrants in rural areas, working in agricultural or food processing sectors.

To test the effects of industrial decline, I examine economic activity and employment rates for the 20 de-industrialising urban areas identified by Turok and Edge (1999). It turns out that the areas losing the most employment during the 1980s and early 1990s also tend to have the weakest labour market performance during the panel period. I re-run the employment regressions excluding these TTWAs.[17] Results are given in Table 18. Coefficients of *DIV* on native employment are smaller and only marginally significant at the 10% level. In IV regressions *DIV* is also reduced, but significance levels are unchanged. So long term patterns of structural change help explain the employment results, although migration is still part of the explanation.

Changes to labour market institutions are likely to condition the effects of migration: it is simplistic to ascribe the results to 'migrants taking jobs'. Several commentators have highlighted the growing share of part time and temporary positions in sectors such as retail, leisure, agribusiness and routine manufacturing, and the growing dependence of many employers in these sectors on migrant employment (Dawley and Stenning 2008, Stenning et al 2006, Green et al 2007). One recent estimate suggests 40% of the 1.5m A8 migrants since 2004 work in agency-dominated sectors such as manufacturing and process work, office employment or retail / hospitality.[18]

Many 'migrant-intensive' employers – particularly those in retail, agribusiness and routine manufacturing – operate low-quality, low-cost production models (Dawley and Stenning 2008). They also depend heavily on temporary employment agencies – which play an important role in organising migrant employment, and in some cases take over firms' overall HR function (EHRC 2010, Fitzgerald 2007, Green et al 2007). Taken together, these changes have helped produce strata of insecure, poorly-paid 'bad jobs', with employers increasingly dependent on networks of imported migrant labour to fill them. Migrant workers

[17] I take the 20 urban areas in the Turok and Edge analysis, plus a small number of panel poor performers. The final 25 selected areas are: Birmingham, Clydeside (Glasgow and Lanarkshire TTWAs), West Yorkshire (Leeds and Bradford), Merseyside (Liverpool and Wirral), London, Manchester, South Yorkshire (Sheffield and Rotherham), Bristol, Cardiff, Coventry, Doncaster, Edinburgh, Hull, Leicester, Nottingham, Plymouth, Stoke on Trent, Sunderland, Wigan, Barnsley, Bolton, Hartlepool, Middlesborough, Newport/Cwmbran and Swansea Bay.

[18] Kath Jones and Kevin Ward (Manchester University) point out that 2008 WERS data suggests that since 2004, 39% of migrants are employed in 'administration, business and management', food processing, manufacturing, hospitality or 'temporary work'.

are often exploited or ill-treated (EHRC 2010). UK-born workers may lack access to employment networks, or they may be unwilling to take low quality jobs (Samuels 2008). At urban level, the migrant-employer-agency nexus may be supporting low-skills equilibrium in some areas.

Further research could take several directions. Sectoral and/or firm-level analysis is needed to explore transmission mechanisms in more depth. Case study work could also explore different types of cities' experiences in detail. Access to robust local cost of living data would allow a proper investigation into migration and local prices in the UK. Finally, it would be worth developing richer diversity measures to explore different facets of Britain's increasingly cosmopolitan urban life.

Table 1. Net international migration across England, 2002-3.

Area	Net migration	% England total
London	77,276	53.0
North / West Mets	23,822	16.4
South / East large cities	13,605	9.3
S / E small cities	10,760	7.4
N / W large cities	7,064	4.8
S / E large towns	5,902	4.1
N / W small cities	3.977	0.0
S / E small towns / rural	3,825	2.6
N / W large towns	1,768	1.2
N / W small towns / rural	-2,281	1.6
England	*145,688*	*100*

Source: Champion (2006) from ONS TIM data.
Note: percentages may not sum to 100 due to rounding.

Table 2. Summary statistics, 1994-2008 panel.

Variable	N	Mean	SD	Min.	Max.
Ave house price	881	109951.4	56910.26	40532.387	290353.2
Ave hourly wage	1185	9.064	2.079	5.097	17.317
Ave hourly wage, UK-born	1185	9.067	2.107	5.091	18.069
Ave hourly wage, migrants	1185	9.456	3.374	2.912	67.75
Ave hourly wage, ethnic minorities	1160	8.806	3.412	1.39	45.42
Ave employment rate	1185	0.741	0.05	0.534	0.844
Ave employment rate, UK-born	1185	0.748	0.05	0.542	0.849
Ave employment rate, migrants	1185	0.676	0.109	0.065	1
Ave employment rate, ethnic minorities	1183	0.62	0.149	0.028	1
Ave ILO unemployment rate	1185	0.045	0.017	0.009	0.135
Ave ILO unemployment rate, UK-born	1185	0.044	0.017	0.008	0.135
Ave ILO unemployment rate, migrants	1185	0.049	0.037	0	0.435
Ave ILO unemployment rate, ethnic minorities	1183	0.064	0.066	0	0.934
% long term unemployed share	1185	0.266	0.117	0	0.624
% long term unemployed share, UK-born	1185	0.266	0.117	0	0.658
% long term unemployed share, migrants	1096	0.257	0.278	0	1
% long term unemployed share, minorities	990	0.261	0.295	0	1
% aged 24 or less	1185	0.267	0.029	0.188	0.366
% aged 29 or less	1185	0.168	0.019	0.104	0.242
% female	1185	0.495	0.012	0.437	0.555
% male	1185	0.505	0.012	0.445	0.563
% non-UK born	1185	0.074	0.046	0.002	0.371
Fractionalisation Index based on country of birth	1185	0.139	0.08	0.004	0.601
Fractionalisation Index of non-UK born populations	1185	0.999	0.001	0.989	1
% ethnic minority	1185	0.054	0.053	0	0.31
% with NVQ4 (degrees / HE qualification)	1185	0.226	0.059	0.085	0.437
% with NVQ2 or 3 (A-levels / good GCSEs)	1185	0.466	0.036	0.328	0.576
% with NVQ1 (other / no qualifications)	1185	0.308	0.065	0.161	0.523
% in pro / senior / associate pro and tech occupations	1185	0.378	0.064	0.212	0.583
% in admin and sec / skilled trades occupations	1185	0.258	0.031	0.149	0.354
% in PPS / sales / routine / other occupations	1185	0.364	0.051	0.227	0.535
% employed in service sector	1185	0.482	0.061	0.313	0.661
% employed in manufacturing	1185	0.162	0.056	0.039	0.331
% employed in other sectors	1185	0.35	0.038	0.215	0.497
population density (total pop / TTWA surface area)	1105	1240.621	793.074	275.37	5846.816
working age population	1105	118168.3	70806.49	44540.098	452477.3

Source: ONS / LFS / Land Registry.

Notes: 1) Due to ONS disclosure rules some observations are suppressed.
2) ONS population data is available from 1994-2007 inclusive.
3) Land Registry house price data is for England and Wales, from 1994-2006 inclusive.

Table 3. Labour market characteristics: UK urban working-age population, 1994-2008.

Variable	N	Mean	SD	Min.	Max.
% with NVQ4	1185	0.226	0.059	0.085	0.437
% with NVQ2 or 3	1185	0.466	0.036	0.328	0.576
% with NVQ1	1185	0.308	0.065	0.161	0.523
% with NVQ4, UK-born	1185	0.226	0.060	0.085	0.446
% with NVQ2 or 3, UK-born	1185	0.483	0.035	0.349	0.593
% with NVQ1, UK-born	1185	0.290	0.070	0.140	0.521
% with NVQ4, migrants	1185	0.263	0.097	0	0.57
% with NVQ2 or 3, migrants	1185	0.269	0.092	0	0.916
% with NVQ1, migrants	1185	0.468	0.124	0.046	0.958
% in pro / senior / associate pro and tech occupations	1185	0.378	0.064	0.212	0.583
% in admin and sec / skilled trades occupations	1185	0.258	0.031	0.149	0.354
% in PPS / sales / routine / other occupations	1185	0.364	0.051	0.227	0.535
% in pro / senior / associate pro and tech occupations, UK-born	1185	0.375	0.065	0.212	0.596
% in admin and sec / skilled trades occupations, UK-born	1185	0.263	0.031	0.151	0.36
% in PPS / sales / routine / other occupations, UK-born	1185	0.362	0.052	0.212	0.531
% in pro / senior / associate pro / tech occupations, migrants	1185	0.454	0.012	0	0.94
% in admin and sec / skilled trades occupations, migrants	1185	0.188	0.083	0	0.544
% in PPS / sales / routine / other occupations, migrants	1185	0.358	0.122	0	1

Source: ONS / LFS.

Table 4. Labour market performance: UK urban working-age population, 1994-2008.

Variable	N	Mean	SD	Min.	Max.
Ave hourly wages, NVQ4	1185	12.843	2.44	7.953	21.328
Ave hourly wages, NVQ2/3	1185	8.033	1.658	4.201	14.733
Ave hourly wages, NVQ1	1185	6.548	1.482	3.764	13.328
Ave hourly wages, NVQ4 UK-born	1185	12.869	2.476	7.818	22.473
Ave hourly wages, NVQ2/3 UK-born	1185	8.04	1.668	4.201	14.667
Ave hourly wages, NVQ1 UK-born	1185	6.43	1.413	3.759	20.977
Ave hourly wages, NVQ4 migrants	1163	12.81	4.885	2.008	84.22
Ave hourly wages, NVQ2/3 migrants	1168	7.841	2.871	1.805	28.485
Ave hourly wages, NVQ1 migrants	1171	7.548	3.697	0.1	60.788
Employment rate, NVQ4	1185	0.864	0.03	0.717	0.962
Employment rate, NVQ2/3	1185	0.767	0.042	0.525	0.865
Employment rate, NVQ1	1185	0.619	0.078	0.324	0.808
Employment rate, NVQ4 UK-born	1185	0.868	0.031	0.704	0.966
Employment rate, NVQ2/3 UK-born	1185	0.77	0.042	0.541	0.873
Employment rate, NVQ1 UK-born	1185	0.624	0.079	0.311	0.819
Employment rate, NVQ4 migrants	1183	0.824	0.135	0	1
Employment rate, NVQ2/3 migrants	1184	0.71	0.158	0	1
Employment rate, NVQ1 migrants	1185	0.589	0.153	0.01	1
ILO unemployment rate, NVQ4	1185	0.027	0.015	0	0.141
ILO unemployment rate, NVQ2/3	1185	0.044	0.018	0.002	0.152
ILO unemployment rate, NVQ1	1185	0.058	0.024	0	0.183
ILO unemployment rate, NVQ4 UK-born	1185	0.026	0.015	0	0.141
ILO unemployment rate, NVQ2/3 UK-born	1185	0.043	0.018	0	0.156
ILO unemployment rate, NVQ1 UK-born	1185	0.059	0.024	0	0.183
ILO unemployment rate, NVQ4 migrants	1183	0.037	0.069	0	1
ILO unemployment rate, NVQ2/3 migrants	1184	0.054	0.071	0	0.692
ILO unemployment rate, NVQ1 migrants	1185	0.055	0.062	0	0.87

Source: ONS / LFS.

Notes: 1) Due to ONS disclosure rules some observations are suppressed.
2) NVQ4 = degree / HE qualification, NVQ3 = A-levels / at least 5 GCSE's A-C grade, NVQ1 = other / no qualifications.

Table 5. Cities with the 25 largest migrant working-age populations, 1994, 2001 and 2008.

1994		2001		2008	
TTWA name	**% non-UK born**	**TTWA name**	**% non UK-born**	**TTWA name**	**% non UK-born**
London	27.4	London	33.1	London	36.8
Bradford	12.7	Wycombe & Slough	15.5	Wycombe & Slough	20.2
Birmingham	12.7	Bradford	15.5	Cambridge	19.7
Wycombe & Slough	12.3	Birmingham	15.4	Bedford	19.7
Bolton	10.9	Leicester	14.7	Luton & Watford	19.1
Leicester	10.8	Luton & Watford	13.8	Leicester	19.0
Coventry	10.4	Reading & Bracknell	13.8	Birmingham	18.8
Luton & Watford	10.0	Brighton	13.7	Reading & Bracknell	18.0
Peterborough	10.0	Bedford	12.8	Milton Keynes & Aylesbury	17.8
Rochdale & Oldham	9.5	Guildford & Aldershot	12.2	Bradford	17.5
Manchester	9.4	Cambridge	11.7	Coventry	16.2
Brighton	9.2	Milton Keynes & Aylesbury	10.9	Peterborough	15.1
Guildford & Aldershot	9.2	Wolverhampton	10.3	Blackburn	14.0
Reading & Bracknell	9.0	Rochdale & Oldham	10.1	Brighton	14.0
Bedford	8.7	Oxford	10.0	Oxford	13.9
Crawley	8.1	Huddersfield	9.9	Wolverhampton	13.8
Huddersfield	8.1	Colchester	9.3	Rochdale & Oldham	13.6
Wolverhampton	7.9	Stevenage	9.1	Guildford & Aldershot	13.5
Oxford	7.8	Bournemouth	8.8	Edinburgh	13.2
Stevenage	7.7	Crawley	8.8	Crawley	12.9
Milton Keynes & Aylesbury	7.7	Blackburn	8.7	Manchester	12.9
Blackburn	7.5	Leeds	8.6	Aberdeen	12.7
Cambridge	7.4	Worthing	8.5	Leeds	12.4
Leeds	7.0	Coventry	8.4	Stevenage	12.0
Worthing	6.9	Gloucester	8.2	Bolton	12.0
Dudley & Sandwell	6.9	Manchester	8.1	Calderdale	11.8
All urban TTWAs	*6.0*	*All urban TTWAs*	*7.3*	*All urban TTWAs*	*10.4*

Source: ONS / LFS

Table 6. The 20 largest migrant groups in UK cities, 1994, 2001 and 2008.

1994		2001		2008	
Country of birth	**% total migrants**	**Country of birth**	**% total migrants**	**Country of birth**	**% total migrants**
India	12.2	Germany	11.2	Poland	9.8
Germany	10.5	India	10.2	India	8.4
Pakistan	9.3	Pakistan	7.6	Pakistan	8.0
USA	3.9	Rep. South Africa	5.0	Germany	7.9
Canada	3.3	USA	3.9	Irish Republic	5.4
Italy	3.0	Bangladesh	3.5	Rep. South Africa	4.8
Kenya	2.7	Kenya	3.0	Zimbabwe	3.0
Rep. South Africa	2.6	Canada	3.0	Bangladesh	2.4
Jamaica	2.4	Australia	2.7	USA	2.3
Australia	2.4	Italy	2.4	Former USSR	2.1
Iran	2.2	Singapore	2.3	Philippines	2.1
Malaysia	2.1	France	2.2	Hong Kong	2.1
France	2.0	Jamaica	2.0	Australia	2.1
Bangladesh	1.9	Malaysia	1.8	Czech Republic	2.0
Singapore	1.8	Other Middle East*	1.6	Italy	1.7
Cyprus	1.7	Cyprus	1.6	China	1.7
Malta & Gozo	1.7	Nigeria	1.5	France	1.7
Other Middle East*	1.7	Zimbabwe	1.5	Kenya	1.6
Uganda	1.3	Malta & Gozo	1.5	Sri Lanka	1.4
Spain	1.3	Netherlands	1.3	Other S / E Asia**	1.3
% non-UK born as share of working-age population	*6.0*	*% non-UK born as share of working-age population*	*7.3*	*% non-UK born as share of working-age population*	*10.4*

Source: ONS / LFS

Note: To ensure comparability over time, country of birth data is drawn from the LFS variable CRYO c.1992. This means that some countries which have emerged since are not included (e.g. former Yugoslavia) and there is limited detail on others (e.g. Middle East outside Israel and Iran).

* = not Iran or Israel. Includes e.g. Iraq, Jordan, Lebanon.

** = not Burma, China, Hong Kong, India, Japan, Malaysia, Pakistan, Philippines, Singapore, Sri Lanka or Vietnam. Includes e.g. Cambodia, Indonesia, Laos, Taiwan, Thailand.

Table 7. Resident wage results, full sample and skill groups. *DIV* = Fractionalisation Index, country of birth.

ln(ave wages) UK-born workers	Whole sample						High-skill		Intermediate		Low skill	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	div	c	div_c	fe_c	maall	maall_nl	maall	maall_nl	maall	maall_nl	maall	maall_nl
fracm	0.979***		0.605***		0.322**	0.339**	0.307	0.277	0.293	0.307	-0.162	0.026
	(0.122)		(0.073)		(0.145)	(0.146)	(0.221)	(0.223)	(0.216)	(0.221)	(0.279)	(0.212)
youth_24		-3.176***	-2.219***	-0.641	-0.615	-0.617	-0.729	-0.725	-0.711	-0.713	-0.796	-0.823
		(0.772)	(0.384)	(0.422)	(0.415)	(0.416)	(0.536)	(0.535)	(0.499)	(0.499)	(0.502)	(0.509)
female		2.023*	0.419	1.441**	1.650**	1.680***	0.839	0.785	1.484	1.509	0.877	1.216*
		(1.127)	(0.586)	(0.631)	(0.632)	(0.627)	(1.002)	(1.012)	(1.001)	(0.997)	(0.763)	(0.678)
hiskills		1.531***	0.963***	0.975***	0.892***	0.898***	0.401	0.389	0.104	0.110	-0.055	0.020
		(0.260)	(0.193)	(0.228)	(0.230)	(0.231)	(0.298)	(0.299)	(0.285)	(0.287)	(0.304)	(0.305)
mf		-0.643***	-0.451***	-0.001	-0.047	-0.033	-0.019	-0.046	0.259	0.271	-0.324	-0.156
		(0.228)	(0.144)	(0.212)	(0.212)	(0.215)	(0.303)	(0.307)	(0.279)	(0.284)	(0.293)	(0.249)
log_pop_density		0.086***	0.010	0.160	0.123	0.127	0.136	0.130	0.054	0.057	0.238*	0.279**
		(0.017)	(0.011)	(0.116)	(0.116)	(0.117)	(0.121)	(0.122)	(0.171)	(0.172)	(0.139)	(0.130)
ltu_share_r		-1.236***	-0.095	0.032	0.006	0.004	-0.171	-0.167	-0.073	-0.075	0.325**	0.301**
		(0.107)	(0.097)	(0.105)	(0.110)	(0.110)	(0.135)	(0.135)	(0.139)	(0.140)	(0.137)	(0.135)
_cons	2.265***	1.301**	2.251***	0.511	0.620	0.576	1.427	1.509	1.225	1.188	0.223	-0.280
	(0.021)	(0.550)	(0.257)	(0.919)	(0.910)	(0.908)	(1.174)	(1.188)	(1.338)	(1.334)	(1.157)	(1.027)
Area fixed effects	N	N	N	Y	Y	Y						
N	158	158	158	158	158	156	158	156	158	156	158	156
F	2292.525	257.806	622.203	1420.819	1344.552	1306.985	402.756	393.948	555.942	544.288	432.170	496.119
N_g				79.000	79.000	78.000	79.000	78.000	79.000	78.000	79.000	78.000
r2	0.889	0.847	0.956	0.988	0.989	0.989	0.971	0.970	0.976	0.976	0.973	0.978
r2_o				0.785	0.839	0.830	0.712	0.721	0.824	0.818	0.587	0.519
r2_b				0.103	0.231	0.134	0.050	0.015	0.084	0.033	0.000	0.025

All specifications include time dummies. HAC standard errors in parentheses. * p<0.1 ** p<0.05 *** p<0.01. Source: ONS / LFS

Table 8. Resident wage results, full sample and skill groups. *DIV* = migrant population share.

ln(ave wages) UK-born workers	Whole sample						High-skill		Intermediate		Low skill	
	(1) div	(2) c	(3) div_c	(4) fe_c	(5) maall	(6) maall_nl	(7) maall	(8) maall_nl	(9) maall	(10) maall_nl	(11) maall	(12) maall_nl
nonbrit	1.649***		1.008***		0.484**	0.552**	0.515	0.447	0.459	0.519	-0.546	-0.016
	(0.213)		(0.129)		(0.238)	(0.244)	(0.352)	(0.374)	(0.347)	(0.371)	(0.596)	(0.373)
youth_24		-3.176***	-2.219***	-0.641	-0.623	-0.626	-0.735	-0.732	-0.718	-0.720	-0.803	-0.826
		(0.772)	(0.385)	(0.422)	(0.417)	(0.418)	(0.537)	(0.537)	(0.500)	(0.500)	(0.499)	(0.509)
female		2.023*	0.352	1.441**	1.617**	1.670***	0.827	0.774	1.461	1.507	0.784	1.192*
		(1.127)	(0.585)	(0.631)	(0.635)	(0.629)	(0.997)	(1.010)	(1.003)	(1.000)	(0.789)	(0.681)
hiskills		1.531***	0.986***	0.975***	0.899***	0.904***	0.399	0.394	0.108	0.112	-0.011	0.028
		(0.260)	(0.192)	(0.228)	(0.230)	(0.231)	(0.299)	(0.299)	(0.286)	(0.287)	(0.301)	(0.305)
mf		-0.643***	-0.439***	-0.001	-0.042	-0.022	-0.018	-0.037	0.263	0.280	-0.301	-0.152
		(0.228)	(0.144)	(0.212)	(0.212)	(0.214)	(0.301)	(0.305)	(0.280)	(0.283)	(0.279)	(0.249)
log_pop_density		0.086***	0.010	0.160	0.123	0.126	0.133	0.130	0.053	0.055	0.260*	0.282**
		(0.017)	(0.011)	(0.116)	(0.116)	(0.117)	(0.121)	(0.122)	(0.171)	(0.172)	(0.137)	(0.130)
ltu_share_r		-1.236***	-0.105	0.032	0.007	0.003	-0.172	-0.167	-0.073	-0.077	0.340**	0.304**
		(0.107)	(0.096)	(0.105)	(0.110)	(0.111)	(0.135)	(0.136)	(0.139)	(0.140)	(0.140)	(0.137)
_cons	2.283***	1.301**	2.285***	0.511	0.645	0.592	1.465	1.521	1.253	1.205	0.127	-0.289
	(0.020)	(0.550)	(0.259)	(0.919)	(0.912)	(0.908)	(1.176)	(1.187)	(1.339)	(1.335)	(1.131)	(1.031)
Area fixed effects	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	158	158	158	158	158	156	158	156	158	156	158	156
F	2252.748	257.806	615.427	1420.819	1316.841	1296.380	410.119	395.401	555.078	544.291	444.222	497.173
N_g				79.000	79.000	78.000	79.000	78.000	79.000	78.000	79.000	78.000
r2	0.887	0.847	0.955	0.988	0.989	0.989	0.971	0.970	0.976	0.976	0.974	0.978
r2_o				0.785	0.838	0.829	0.719	0.720	0.823	0.818	0.548	0.513
r2_b				0.103	0.221	0.129	0.052	0.013	0.076	0.030	0.001	0.027

HAC standard errors in parentheses. All specifications include time dummies. * p<0.1 ** p<0.05 *** p<0.01. Source: ONS / LFS

Table 9. Resident employment rate results, full sample and skill groups. *DIV* = Fractionalisation Index, country of birth.

ln(ave employment rate) UK-born workers	Whole sample						High skill		Int skill		Low skill	
	(1) div	(2) c	(3) div_c	(4) fe_c	(5) maall	(6) maall_nl	(7) maall	(8) maall_nl	(9) maall	(10) maall_nl	(11) maall	(12) maall_nl
fracm	0.266*		0.207***		-0.228**	-0.223**	-0.084	-0.074	-0.292***	-0.254**	-0.497**	-0.484**
	(0.140)		(0.070)		(0.101)	(0.104)	(0.099)	(0.103)	(0.103)	(0.103)	(0.224)	(0.230)
youth_24		-0.823***	-0.939***	-0.186	-0.205	-0.206	0.148	0.146	-0.500*	-0.506**	-0.216	-0.218
		(0.257)	(0.241)	(0.282)	(0.269)	(0.269)	(0.202)	(0.201)	(0.256)	(0.253)	(0.703)	(0.704)
female		-1.767***	-1.172**	-0.491	-0.639*	-0.630*	0.130	0.148	-0.589	-0.521	-1.051*	-1.028
		(0.539)	(0.514)	(0.350)	(0.344)	(0.347)	(0.360)	(0.359)	(0.374)	(0.373)	(0.625)	(0.630)
hiskills		0.513***	0.345***	0.311***	0.370***	0.372***	0.401***	0.405***	0.002	0.017	0.355	0.360
		(0.114)	(0.099)	(0.116)	(0.117)	(0.117)	(0.107)	(0.108)	(0.118)	(0.119)	(0.313)	(0.313)
mf		0.255***	0.200**	0.036	0.069	0.073	0.073	0.082	0.220	0.253*	0.167	0.178
		(0.088)	(0.085)	(0.147)	(0.137)	(0.140)	(0.113)	(0.114)	(0.139)	(0.138)	(0.280)	(0.287)
log_pop_density		-0.018***	-0.020***	-0.226***	-0.200**	-0.199**	-0.089	-0.086	-0.176*	-0.168*	0.154	0.157
		(0.006)	(0.007)	(0.078)	(0.076)	(0.076)	(0.060)	(0.060)	(0.104)	(0.100)	(0.168)	(0.168)
ltu_share_r		-0.178***	-0.356***	-0.255***	-0.236***	-0.237***	-0.076	-0.078	-0.160**	-0.165**	-0.193*	-0.194*
		(0.060)	(0.069)	(0.061)	(0.061)	(0.061)	(0.060)	(0.060)	(0.064)	(0.063)	(0.107)	(0.107)
_cons	-0.330***	0.724***	0.511**	1.454**	1.377**	1.359**	0.276	0.247	1.331*	1.226*	-0.961	-0.992
	(0.025)	(0.245)	(0.231)	(0.573)	(0.551)	(0.550)	(0.428)	(0.424)	(0.714)	(0.690)	(1.185)	(1.185)
Area fixed effects	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	158	158	158	158	158	156	158	156	158	156	158	156
F	40.126	34.800	35.671	27.625	25.385	24.767	10.570	10.424	6.927	6.943	11.110	10.800
N_g				79.000	79.000	78.000	79.000	78.000	79.000	78.000	79.000	78.000
r2	0.188	0.607	0.676	0.695	0.711	0.710	0.471	0.472	0.386	0.396	0.450	0.446
r2_o				0.265	0.234	0.244	0.052	0.060	0.225	0.188	0.107	0.102
r2_b				0.267	0.228	0.236	0.036	0.041	0.243	0.199	0.188	0.179

HAC standard errors in parentheses. All specifications include time dummies. * p<0.1 ** p<0.05 *** p<0.01. Source: ONS / LFS

Table 10. Resident employment rate results, full sample and skill groups. *DIV* = migrant population share.

Ln(ave employment	Whole sample	High skill	Intermediate	Low skill

rate) UK-born workers	(1) div	(2) c	(3) div_c	(4) fe_c	(5) maall	(6) maall_nl	(7) maall	(8) maall_nl	(9) maall	(10) maall_nl	(11) maall	(12) maall_nl
nonbrit	0.415*		0.321**		-0.403**	-0.407**	-0.151	-0.128	-0.553***	-0.468***	-0.819**	-0.816**
	(0.248)		(0.128)		(0.158)	(0.173)	(0.158)	(0.176)	(0.168)	(0.170)	(0.354)	(0.388)
youth_24		-0.823***	-0.940***	-0.186	-0.201	-0.201	0.149	0.148	-0.497*	-0.501**	-0.206	-0.206
		(0.257)	(0.242)	(0.282)	(0.267)	(0.267)	(0.202)	(0.201)	(0.253)	(0.251)	(0.703)	(0.703)
female		-1.767***	-1.210**	-0.491	-0.638*	-0.641*	0.130	0.148	-0.601	-0.534	-1.026	-1.024
		(0.539)	(0.524)	(0.350)	(0.342)	(0.345)	(0.361)	(0.359)	(0.369)	(0.371)	(0.624)	(0.631)
hiskills		0.513***	0.364***	0.311***	0.374***	0.374***	0.403***	0.405***	0.013	0.020	0.355	0.355
		(0.114)	(0.102)	(0.116)	(0.117)	(0.116)	(0.106)	(0.107)	(0.117)	(0.118)	(0.313)	(0.312)
mf		0.255***	0.205**	0.036	0.070	0.069	0.073	0.080	0.224	0.248*	0.164	0.165
		(0.088)	(0.085)	(0.147)	(0.137)	(0.140)	(0.113)	(0.114)	(0.137)	(0.138)	(0.282)	(0.290)
log_pop_density		-0.018***	-0.019***	-0.226***	-0.196**	-0.196**	-0.087	-0.086	-0.168	-0.164	0.159	0.159
		(0.006)	(0.007)	(0.078)	(0.076)	(0.076)	(0.060)	(0.060)	(0.103)	(0.100)	(0.168)	(0.168)
ltu_share_r		-0.178***	-0.359***	-0.255***	-0.234***	-0.234***	-0.075	-0.077	-0.155**	-0.161**	-0.191*	-0.192*
		(0.060)	(0.070)	(0.061)	(0.061)	(0.061)	(0.060)	(0.060)	(0.063)	(0.063)	(0.106)	(0.106)
_cons	-0.322***	0.724***	0.526**	1.454**	1.343**	1.341**	0.262	0.242	1.277*	1.205*	-1.019	-1.018
	(0.024)	(0.245)	(0.235)	(0.573)	(0.547)	(0.548)	(0.427)	(0.424)	(0.702)	(0.687)	(1.193)	(1.186)
Area fixed effects	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	158	158	158	158	158	156	158	156	158	156	158	156
F	40.350	34.800	34.616	27.625	25.523	24.950	10.600	10.453	7.309	7.150	11.383	10.790
N_g				79.000	79.000	78.000	79.000	78.000	79.000	78.000	79.000	78.000
r2	0.173	0.607	0.671	0.695	0.713	0.713	0.472	0.473	0.402	0.402	0.450	0.445
r2_o				0.265	0.236	0.246	0.053	0.060	0.226	0.188	0.101	0.097
r2_b				0.267	0.229	0.237	0.036	0.042	0.242	0.198	0.177	0.170

HAC standard errors in parentheses. All specifications include time dummies. * p<0.1 ** p<0.05 *** p<0.01. Source: ONS / LFS

Table 11. Average house price results, full sample. *DIV* = Fractionalisation Index, country of birth.

ln(ave house prices)	**(1)** **div**	**(2)** **c**	**(3)** **div_c**	**(4)** **fe_c**	**(5)** **maall**	**(6)** **maall_nl**
fracm	1.667***		0.828***		-0.281	-0.080
	(0.305)		(0.177)		(0.450)	(0.442)
youth_24		-3.652***	-4.157***	-1.642	-1.468	-1.660
		(1.318)	(1.321)	(1.768)	(1.643)	(1.630)
female		-3.557**	-3.465**	-1.351	-1.352	-1.336
		(1.678)	(1.656)	(1.591)	(1.617)	(1.592)
hiskills		2.975***	2.172***	0.953*	1.036**	1.000*
		(0.386)	(0.413)	(0.496)	(0.513)	(0.520)
mf		-1.231***	-1.221***	0.565	0.603	0.670
		(0.417)	(0.395)	(0.661)	(0.641)	(0.643)
log_pop_density		0.023	-0.012	1.686***	1.747***	1.800***
		(0.028)	(0.028)	(0.309)	(0.339)	(0.332)
ltu_share_r		-0.307	-0.249	-0.304**	-0.310**	-0.300**
		(0.251)	(0.246)	(0.146)	(0.145)	(0.143)
_cons	11.749***	13.715***	14.044***	1.535	1.126	0.796
	(0.053)	(0.746)	(0.704)	(2.140)	(2.311)	(2.259)
Area fixed effects	N	N	N	Y	Y	Y
N	147	147	147	147	147	145
F	1792.911	485.541	502.649	1107.066	1002.025	1060.740
N_g				74.000	74.000	73.000
r2	0.851	0.938	0.944	0.988	0.988	0.988
r2_o				0.108	0.099	0.081
r2_b				0.018	0.021	0.056

HAC standard errors in parentheses. All specifications include time dummies. * p<0.1 ** p<0.05 *** p<0.01.
Source: ONS / LFS / Land Registry. Note: house price data is available for England and Wales only, 1995-2006.

Table 12. Average house price results, full sample. *DIV* = migrant population share.

ln(ave house prices)	(1) div	(2) c	(3) div_c	(4) fe_c	(5) maall	(6) maall_nl
nonbrit	2.799***		1.371***		-0.650	-0.154
	(0.549)		(0.306)		(0.779)	(0.769)
youth_24		-3.652***	-4.104***	-1.642	-1.421	-1.656
		(1.318)	(1.324)	(1.768)	(1.657)	(1.632)
female		-3.557**	-3.514**	-1.351	-1.366	-1.339
		(1.678)	(1.652)	(1.591)	(1.618)	(1.590)
hiskills		2.975***	2.226***	0.953*	1.062**	1.002*
		(0.386)	(0.408)	(0.496)	(0.512)	(0.520)
mf		-1.231***	-1.209***	0.565	0.614	0.669
		(0.417)	(0.396)	(0.661)	(0.646)	(0.647)
log_pop_density		0.023	-0.011	1.686***	1.773***	1.802***
		(0.028)	(0.028)	(0.309)	(0.337)	(0.332)
ltu_share_r		-0.307	-0.269	-0.304**	-0.312**	-0.301**
		(0.251)	(0.247)	(0.146)	(0.145)	(0.144)
_cons	11.777***	13.715***	14.058***	1.535	0.953	0.786
	(0.052)	(0.746)	(0.701)	(2.140)	(2.301)	(2.259)
Area fixed effects	N	N	N	Y	Y	Y
N	147	147	147	147	147	145
F	1759.328	485.541	490.471	1107.066	1037.504	1061.668
N_g				74.000	74.000	73.000
r2	0.849	0.938	0.943	0.988	0.988	0.988
r2_o				0.108	0.095	0.081
r2_b				0.018	0.022	0.056

HAC standard errors in parentheses. All specifications include time dummies. * p<0.1 ** p<0.05 *** p<0.01.
Source: ONS / LFS / Land Registry. Note: house price data is available for England and Wales only, 1995-2006.

Table 13. Wages and employment rates results for skillgroup cells. *DIV* = Fractionalisation Index.

ln(native wages), by skillgroup	**High skills**			**Intermediate skills**			**Low skills**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
fracm_hs	0.100			0.075			-0.307		
	(0.215)			(0.187)			(0.263)		
fracm_is		0.015			-0.106			-1.106*	
		(0.324)			(0.371)			(0.635)	
fracm_ls			0.172**			0.211**			0.174*
			(0.083)			(0.099)			(0.088)
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	158	158	158	158	158	158	158	158	158
F	366.465	371.575	439.257	580.606	538.195	536.474	474.232	451.923	474.767
r2	0.970	0.970	0.971	0.976	0.976	0.977	0.974	0.975	0.974

ln(native empl), by skillgroup	**High skills**			**Intermediate skills**			**Low skills**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
fracm_hs	-0.081			-0.098			-0.285		
	(0.059)			(0.089)			(0.180)		
fracm_is		-0.079			-0.399**			-0.055	
		(0.162)			(0.188)			(0.292)	
fracm_ls			-0.031			-0.124***			-0.179**
			(0.043)			(0.045)			(0.085)
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	158	158	158	158	158	158	158	158	158
F	10.017	9.256	9.914	5.674	6.795	6.476	10.301	9.988	10.354
r2	0.474	0.468	0.470	0.347	0.374	0.386	0.434	0.411	0.439

HAC standard errors in parentheses. All specifications include time dummies and area fixed effects. * p<0.1 ** p<0.05 *** p<0.01.
Source: ONS/LFS

Table 14. Test for native outflows, based on Card (2005).

% all low skilled workers	**(1)** **skills_ols**	**(2)** **skills_fe**
% low skilled migrants	0.2549*** (0.051)	0.0504 (0.052)
_cons	0.1910*** (0.025)	0.2336*** (0.025)
Area fixed effects, year dummies	No	Yes
N	158	158
F	25.1296	503.0060
N_g		79.0000
r2	0.1194	0.9249
r2_w		0.9249
r2_o		0.6056
r2_b		0.3432

HAC standard errors in parentheses. * p<0.1 ** p<0.05 *** p<0.01
Years = 1994/96, 2006/08
Source: ONS / LFS

Table 15. Test for native outflows: simple internal migration model. Dependent variable = ln(% UK-born population).

ln(% UK-born)	(1)	(2)	(3)	(4)	(5)	(6)
ln(% migrants)	-0.0807***	-0.0771***	-0.0749***	-0.0833***	-0.0805***	-0.0767***
	(0.011)	(0.009)	(0.008)	(0.012)	(0.011)	(0.008)
log_price	-0.0043	-0.0218	-0.0220**	0.0039	-0.0103	-0.0193*
	(0.008)	(0.015)	(0.010)	(0.006)	(0.010)	(0.011)
log_wage	-0.0568**	-0.0766**	-0.0099			
	(0.026)	(0.034)	(0.025)			
log_empl	0.2280**	0.2896**	0.2201***			
	(0.096)	(0.119)	(0.044)			
log_ltu_share	-0.0174	-0.0065	-0.0065			
	(0.013)	(0.009)	(0.006)			
log_wage_r				-0.0711**	-0.0881**	-0.0239
				(0.035)	(0.042)	(0.029)
log_empl_r				0.2272**	0.2721**	0.2181***
				(0.098)	(0.116)	(0.044)
log_ltu_share_r				-0.0160	-0.0083	-0.0054
				(0.013)	(0.010)	(0.005)
_cons	-0.0839	0.2211	0.0528	-0.1554**	0.0908	0.0478
	(0.094)	(0.241)	(0.120)	(0.065)	(0.193)	(0.121)
Year dummies		Y	Y		Y	Y
Area fixed effects			Y			Y
N	147	147	147	147	147	147
F	75.0915	62.1244	44.6449	89.2802	72.3441	48.6430
r2	0.8197	0.8318	0.7672	0.8163	0.8251	0.7678

Years = 1994/6 – 2004/6. HAC standard errors in parentheses. * p<0.1 ** p<0.05 *** p<0.01

Source: ONS / LFS

Table 16. Results for IV regressions, resident wages and resident employment rates

ln(ave wages) UK-born workers	Whole sample		High skill workers		Intermediate skill		Low skill workers	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
fracm	0.142	0.222	0.660*	0.523	0.154	0.223	-1.467	-0.388
	(0.298)	(0.362)	(0.364)	(0.415)	(0.319)	(0.394)	(0.955)	(0.529)
Area fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
N	158	156	158	156	158	156	158	156
F	1305.108	1297.896	452.435	428.078	556.269	558.035	319.553	478.934
N_g	79.000	78.000	79.000	78.000	79.000	78.000	79.000	78.000
r2	0.989	0.989	0.970	0.970	0.976	0.976	0.966	0.977

HAC standard errors in parentheses. All specifications include time dummies. * p<0.1 ** p<0.05 *** p<0.01. Source: ONS / LFS

First-stage results, whole sample including London

Variable	Partial R^2	F (1, 78)	P-value
Fracm	0.2868	21.79	0.0000

ln(ave employment rate) UK-born workers	Whole sample		High skill workers		Intermediate skill		Low skill workers	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
fracm	-0.718***	-0.799***	-0.256*	-0.223	-0.968***	-0.852***	-0.719**	-0.679*
	(0.173)	(0.209)	(0.142)	(0.166)	(0.212)	(0.217)	(0.288)	(0.361)
Area fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
N	158	156	158	156	158	156	158	156
F	19.901	18.825	11.044	10.724	6.055	5.892	10.333	9.762
N_g	79.000	78.000	79.000	78.000	79.000	78.000	79.000	78.000
r2	0.637	0.611	0.451	0.458	0.123	0.192	0.442	0.440

HAC standard errors in parentheses. All specifications include time dummies. * p<0.1 ** p<0.05 *** p<0.01. Source: ONS / LFS

First-stage results, whole sample including London

Variable	Partial R^2	F (1, 78)	P-value
Fracm	0.2868	21.79	0.0000

Table 17. Results for IV regressions, house prices.

ln(ave house prices)	(1) ma	(2) ma_nl
fracm	-1.045 (0.803)	-0.231 (0.755)
Area fixed effects	Y	Y
N	146	144
F	1208.685	1180.526
N_g	73.000	72.000
r2	0.987	0.988

HAC standard errors in parentheses. All specifications include time dummies. * p<0.1 ** p<0.05 *** p<0.01. Source: ONS / LFS

First stage results, whole sample including London

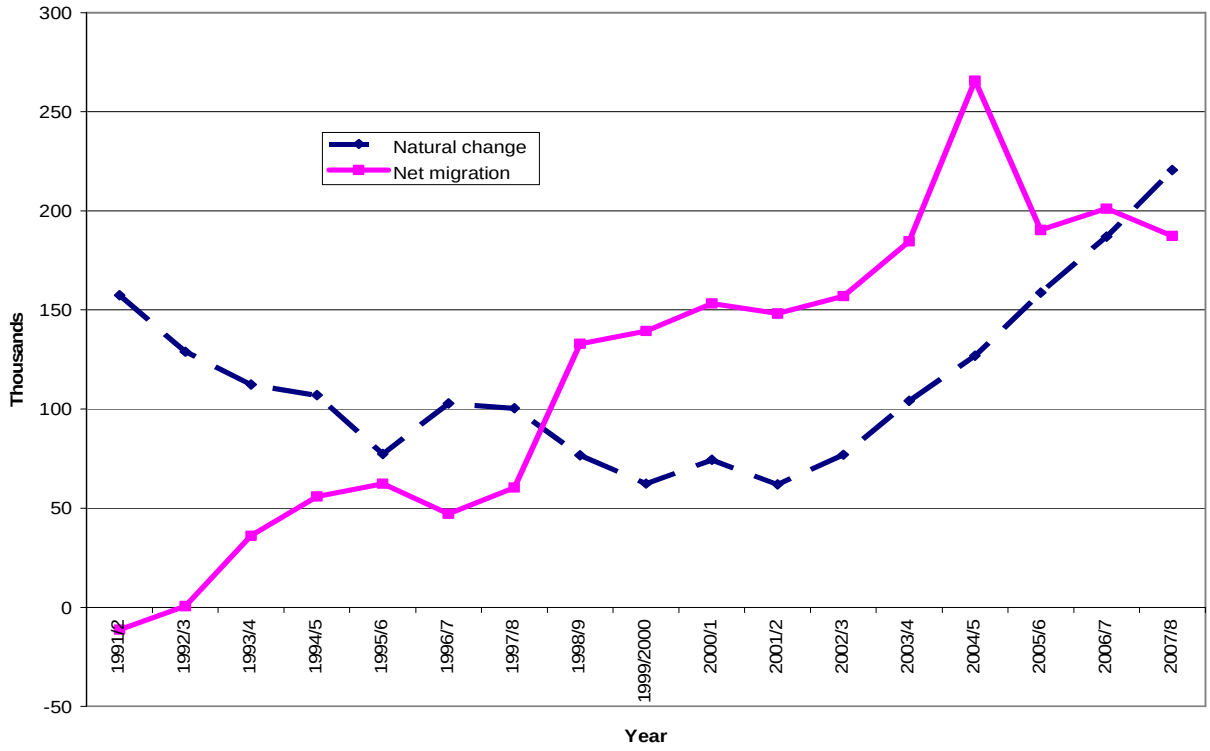
Variable	Partial R^2	F (1, 71)	P-value
Fracm	0.3296	39.39	0.0000

Table 18. Employment results removing ex-industrial TTWAs.

depvar = ln(employment rate), natives	FE		IV	
	(1)	(4)	(1)	(4)
	all	no ex-industrial	all	no ex-industrial
fracm	-0.228** (0.101)	-0.188* (0.101)	-0.718*** (0.173)	-0.572*** (0.216)
Controls	Y	Y	Y	Y
N	158	100	158	100
F	25.385	14.062	19.901	10.181
N_g	79.000	50.000	79.000	50.000
r2	0.711	0.565	0.637	0.473

HAC standard errors in parentheses. All specifications include time dummies and area fixed effects. * p<0.1 ** p<0.05 *** p<0.01. Source: ONS / LFS

Figure 1. Drivers of population growth in the UK, mid-1991-mid-2008.



Source: ONS / TIM data.

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