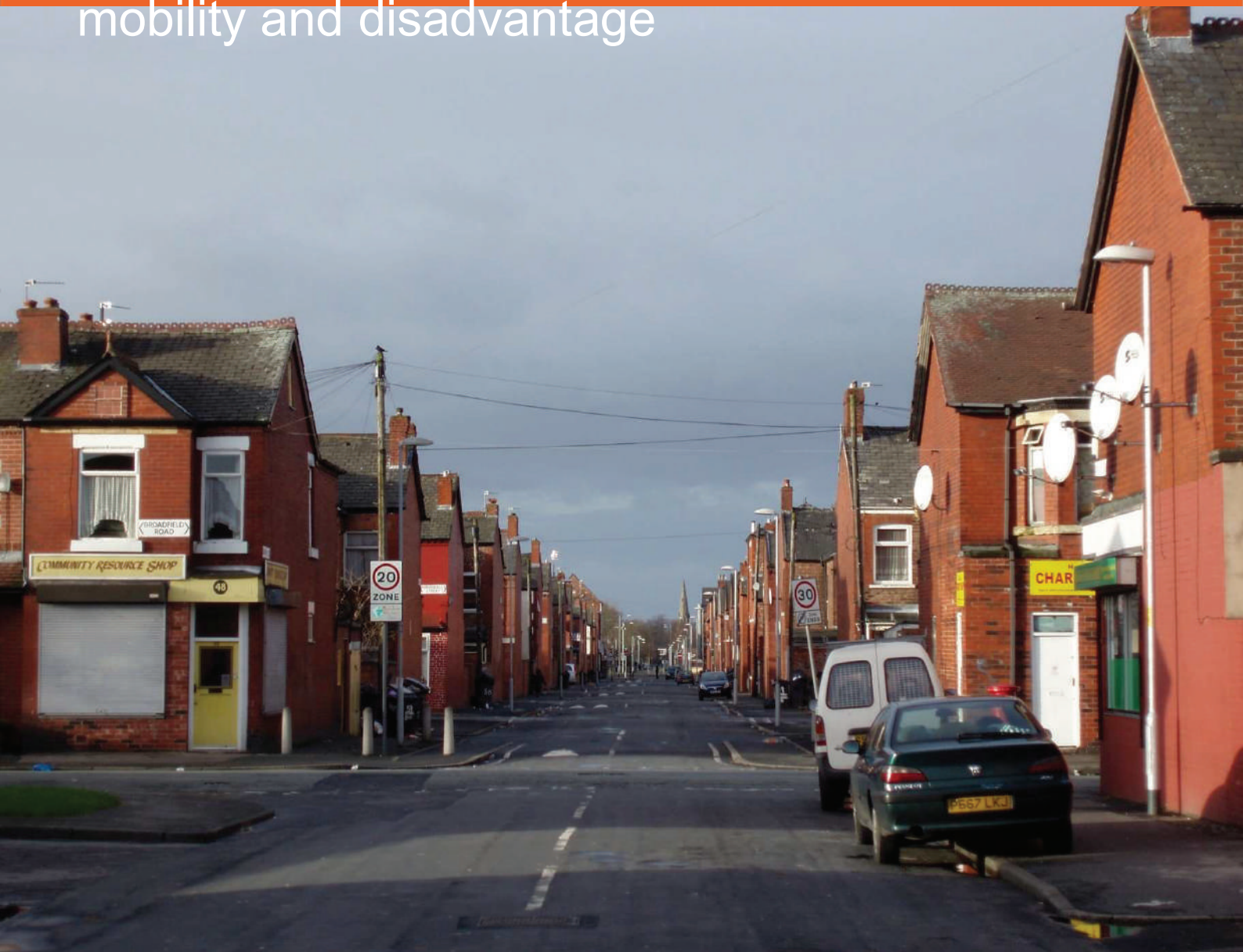




Social Mobility  
Commission

# Moving out to move on

Understanding the link between migration, social mobility and disadvantage



Technical report  
July 2020



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The Social Mobility Commission is an independent advisory non-departmental public body established under the Life Chances Act 2010 as modified by the Welfare Reform and Work Act 2016. It has a duty to assess progress in improving social mobility in the UK and to promote social mobility in England.

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# Introduction

This project investigates the link between internal migration and social mobility and explores the extent to which migration from deprived to prosperous areas leads to better employment outcomes and quality of life in general. It also looks at the level and direction of migration flows from deprived areas, and how out-migration affects people who remain in those areas. These issues are addressed using a mixed-methods approach, comprising:

- a quantitative analysis of secondary and aggregate data
- a qualitative analysis of insights from interviews and focus group discussions with individuals who have migrated out of deprived areas and with those who live in deprived areas

This technical report provides additional information on the methodological approach for the qualitative and the quantitative research strands of the report. It also provides a series of supplementary tables with results from the econometric analysis.

First, we discuss the qualitative research and assess some of the limitations encountered. We then move on to set out the approach to the quantitative analysis. We discuss the data that we collected for the qualitative research and the data sources and details of the data we use in the quantitative analysis. Finally, we explain the statistical methods we use for the quantitative analysis.

## Research context: technical background

### Measures of intergenerational social mobility

Social mobility has been studied extensively by sociologists and more recently also by economists and other social scientists, and the measures used to quantify it vary based on the discipline and the data available. The main indicators used are occupational status mobility, class mobility and earnings mobility.

Occupational status mobility and class mobility are predominantly used by sociologists, whereas earnings mobility is employed more often by economists. All measures and their subsequent variations have shortcomings and restrictions; the choice of the most suitable indicator depends

on the exact question being asked, but also on the quality and availability of data, and on the context.<sup>1</sup>

Occupational status comprises the average educational level and earnings of an occupation. Class status is defined by: employment type (employment or self-employment); skill level; the size of the workplace; the level of authority of the individual in the workplace; and the sector.<sup>2</sup> The National Statistics Socio-economic Classification (NS-SEC) measure based on these characteristics, which defines the socio-economic status of an individual and their class, is widely used in the UK.<sup>3</sup>

Another proxy for intergenerational mobility is the level of a child's earnings compared with those of their parents. One common measure used to estimate this is intergenerational income elasticity, which captures the association in incomes within families across generations. The indicator captures opportunity and income distributions for both parent and child.<sup>4</sup> One of its main drawbacks, however, is that it requires an approximation of lifelong earnings for parent and child. These data are difficult to collect over time without measurement error. This is not such a problem with the socio-economic measure mentioned above, as it is easier to observe both for the child and the parent, even retrospectively.

There are two main categories of social mobility: absolute social mobility and relative social mobility. Absolute social mobility is the average change in socio-economic status over time. An increase in average real life-time earnings over time, for example, indicates an increase in absolute social mobility. Relative social mobility captures the likelihood of an individual from a disadvantaged background increasing their socio-economic status compared with the likelihood of an individual from a higher socio-economic background retaining that higher status. The intergenerational income elasticity mentioned above, for example, shows the socio-economic status of a child relative to that of their parent, which can be described as social fluidity; if the correlation between the two generations is high then social fluidity is low.

### Trends in intergenerational social mobility in Great Britain

There is some debate over trends in intergenerational social mobility in Great Britain. Economists report an increase in intergenerational income elasticity over the past few decades, indicating lower social fluidity.<sup>5</sup> At the same time, sociologists have found that total mobility has been relatively stable, while upward mobility has decreased and downward mobility has increased.<sup>6</sup> They also conclude that relative class mobility has been generally stable, indicating that social fluidity has remained unchanged over time.<sup>7</sup> The findings from the two disciplines are

<sup>1</sup> Torche, F. (2015). Analyses of intergenerational mobility: An interdisciplinary review. *The Annals of the American Academy of Political and Social Science*, 657(1), 37-62.

<sup>2</sup> Ibid

<sup>3</sup> Office for National Statistics (2019). *The National Statistics Socio-economic Classification (NS-SEC)*, July, London: ONS.

<sup>4</sup> Gregg, P., Macmillan, L., Vittori, C. (2017). Moving towards estimating sons' lifetime intergenerational economic mobility in the UK, *Oxford Bulletin of Economics and Statistics*, 79(1), 79-100.

<sup>5</sup> Ibid

<sup>6</sup> Total mobility is the proportion of people who, as adults, find themselves in a different class than that of their parents. That can happen through both upward mobility and downward mobility.

<sup>7</sup> Goldthorpe, J.H. (2016). Social class mobility in modern Britain: changing structure, constant process, *Journal of the British Academy*, 4, 89-111.

not clearly comparable, partly because they use different approaches and different measures to capture social mobility.<sup>8</sup>

In the period following the Second World War, young people were found to be at higher risk than previous generations of being downwardly mobile. From a sociological perspective, Goldthorpe focused on the period following the Second World War, using NS-SEC to investigate changes in absolute and relative social class mobility of men and women in Great Britain. He found that young people today are at higher risk than previous generations of downgrading to a lower socio-economic status than that of their parents. With respect to social fluidity, using odds ratios, he reported that even though relative mobility had not changed much on average, it had increased for women.<sup>9</sup>

Looking at intergenerational economic mobility, Blanden and others found the connection between the earnings of people born in 1970 and their parents' income was stronger than it was for a cohort born in 1958.<sup>10</sup> This work launched a series of inquiries on the topic that further supported these findings. In one of the most recent studies, Gregg and others considered the link between economic circumstances during childhood and subsequent economic circumstances as an adult.<sup>11</sup> This study used longitudinal data and included individuals who had experienced periods out of work. It found an even higher level of intergenerational income persistence than that estimated previously.

This project focuses on the employment outcomes of people who migrate internally and those who do not. It investigates how those differences relate to people's socio-economic background and the area they grew up. In the following sections we discuss our methodological approach as well as the data used and limitations.

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<sup>8</sup> Blanden, J., Gregg, P., Macmillan, L. (2012). Intergenerational persistence in income and social class: The effect of within-group inequality, *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 176(2), 541–563.

<sup>9</sup> Goldthorpe, J.H. (2016). Social class mobility in modern Britain: changing structure, constant process, *Journal of the British Academy*, 4, 89–111

<sup>10</sup> Blanden, J., Goodman, A., Gregg, P., Machin, S. (2004). Changes in intergenerational mobility in Britain. In: M. Corak (ed.), *Generational income mobility in North America and Europe* (pp. 122–146), Cambridge: Cambridge University Press.

<sup>11</sup> Gregg, P., Macmillan, L., Vittori, C. (2017). Moving towards estimating sons' lifetime intergenerational economic mobility in the UK, *Oxford Bulletin of Economics and Statistics*, 79(1), 79-100.



# In-depth qualitative research

The qualitative research for this project was carried out between October and December 2019. It comprised 20 focus groups and 39 in-depth telephone interviews.<sup>12</sup> The focus groups were largely conducted in social mobility ‘cold-spot’ locations with individuals who were currently living there and had lived in this location at the age of 14. The in-depth interviews meanwhile focused largely on individuals currently living within social mobility ‘hot-spot’ locations. Most of these individuals had moved to this area from another location (predominantly social mobility cold spots).

The initial rationale for this split across the different data collection methods used for this project was that individuals who had moved from one location to another may have more complex individual stories and career and education trajectories than individuals who live in the same location as they did when they were aged 14. In reality, it became apparent that those currently living in cold-spot locations also had complex personal histories, with some having moved away from this area for a period before returning at a later life stage. As the study progressed, the sample was adjusted so that both sets of interviewees were better represented across the two modes of data collection, though some of these initial imbalances remained.

The focus groups took place in 10 locations spread across UK regions. Seven of the locations selected were in social mobility cold spots, while the remaining three locations were social mobility hot spots:

Cold spot locations	Hot spot locations
Crawley	Cardiff
Derby	Central London
Liverpool	Edinburgh
Merthyr Tydfil	-

<sup>12</sup> Interviewees were recruited via a research recruitment agency. The agency aimed to recruit a mix of interviewees across genders, ages, ethnicities and educational levels within local area populations. The background details of interviewees were recorded to ensure this spread was achieved and support an analysis of the characteristics of the research sample.

Cold spot locations	Hot spot locations
Nuneaton	-
Paisley	-
Wakefield	-

Two focus groups were completed in each location; one with interviewees aged between 18 and 29 and another with interviewees aged between 30 and 49, to explore differences in experiences of living in an area based on life stage. Each focus group aimed to include a maximum of seven interviewees and lasted for between 60 and 90 minutes. Overall, 139 individuals participated in this element of the research.

As with the focus groups, the in-depth interviews were completed with individuals living across different UK regions. Interviewees were sampled between the ages of 25 and 40. The sample included four types of interviewee. These were individuals who:

- had previously lived in a **cold-spot** location at the age of 14, and currently lived in a **hot-spot** location
- had previously lived in a **hot-spot** location at the age of 14, and currently lived in a different **hot-spot** location
- currently lived in the same **hot-spot** location as they did at the age of 14
- currently lived in the same **cold-spot** location as they did at the age of 14

Across these different groups of interviewees, the sample was split in the following way:

Interviewee type	No. of interviewees
<b>Cold to hot spot</b>	19
<b>Hot to different hot spot</b>	5
<b>Hot to same hot spot</b>	5
<b>Cold to same cold spot</b>	10
<b>Total</b>	39

As shown above, the largest sample of interviewees were cold to hot-spot 'movers', while the second largest group were cold-spot 'stayers'. While the research questions for this project

were framed around a comparison of the experiences of these two groups, smaller groups of interviewees who had moved from different hot spots, or who live within the same hot spot as they did at the age of 14, were also included in the sample. The reasoning for this was to see whether their experiences of living in these locations and of accessing employment differed from the experiences of those who had previously lived within a cold spot, and therefore whether or not having previously lived in a hot spot conferred any noticeable socio-economic advantages.

## Limitations

As with all qualitative research, because a limited number of individuals were included in the study, the views presented are not representative of all types of interviewee. It is therefore not possible to provide a quantification of the number of interviewees that hold particular views or have particular experiences. However, where necessary for understanding, some indication of scale is provided, using statements such as 'many', 'some' and 'few'.

It should also be noted that the number of interviews completed with individuals who had moved from different hot spots or live within the same hot spot as they did at the age of 14 was small (five per group). In the analysis of the interview findings, it was therefore difficult to discern any common differences in the experiences of these groups, compared with other types of interviewee. Their decisions to move or stay within the same location were similar to those of other interviewee types, and as noted in the main report, employment experiences could be highly variable within locations, depending on an individual's personal circumstances. As a result there was no clear socio-economic advantage for these groups to having already lived in a hot-spot location; due to the small sample size it is not possible to say that there was no benefit from remaining within a hot spot – rather, it was not possible to observe this in the qualitative research. The findings for these interviewee types are therefore not highlighted in the main report, though they have fed into the general qualitative analysis presented.

## Characteristics of the research sample

While the characteristics of research participants were largely homogeneous, there were a few clear differences between those living in affluent and disadvantaged locations.

The gender balance among participants in the focus groups was roughly even (55% women; 45% men) and the split was similar across disadvantaged and affluent areas. In the in-depth interviews, a slightly higher proportion of interviewees were women (59% compared with 41% men). Again, the split across disadvantaged and affluent areas was similar.

In terms of ethnicity, most interviewees across both focus groups (89%) and in-depth interviews (85%) were white, while the next-largest group comprised individuals from Asian backgrounds. No individuals from ethnic minority backgrounds were recruited from the most geographically isolated disadvantaged locations for the in-depth interviews, while the focus groups held in disadvantaged locations had a more diverse ethnic mix overall. This may have been because the in-depth interviews sampled individuals from a greater range of disadvantaged locations, including more remote areas of the UK.

The greatest differences in the sample between disadvantaged and affluent areas related to interviewees' highest qualification level and whether or not they had dependent children. A greater proportion of those sampled from affluent areas had higher-level qualifications (at Level 6 or above) compared with those living in disadvantaged locations.

Within the focus groups, over half the interviewees (55%) from affluent areas held a bachelor's degree or equivalent, while 20% held a postgraduate-level qualification. In comparison, less than a third (29%) of interviewees in disadvantaged locations held a bachelor's degree, while 7% held a postgraduate qualification.

In the interview sample, 76% (22 out of 29 interviewees) living in affluent areas held a bachelor's degree or higher. For disadvantaged locations, only 2 out of 10 interviewees had attained these higher-level qualifications.

There were also large differences in interviewees' caring responsibilities. In the focus groups, just 18% of the sample recruited from affluent areas had dependent children. This contrasted with participants in disadvantaged locations, where almost half the sample had dependent children (48%). Among interviewees, 45% of those from affluent areas had dependent children (13 out of 29), compared with 8 out of 10 interviewees recruited from disadvantaged locations.

We found that interviewees' educational attainment, and whether or not they had started a family at a young age, significantly influenced their subsequent life experiences and were strongly linked to whether they moved to an affluent area or stayed within, or returned to, a disadvantaged location.

## **The background of research participants**

As most interviewees had grown up in disadvantaged locations, their accounts showed a degree of uniformity. Individuals who had moved, however, were more likely to describe feelings of boredom concerning their hometown, and what they saw as a lack of social, cultural and economic opportunities.

There were also clearer differences between the two groups' experiences of becoming older and leaving school/college. It was common for those who had moved later to enter into higher education around the age of 18 – in many cases moving away from their local area for the first time.

Among those who had remained in, or later returned to, disadvantaged locations, educational trajectories were sometimes shorter, with more interviewees leaving school/college and entering straight into employment in their local area. Generally, these individuals did not have a clear idea of what career they wanted to pursue and sought easily obtainable paid employment opportunities. However, this did not discourage them from engaging in further education and training at a later life stage.

# Quantitative analysis

In this section we discuss the methodological approach to the quantitative part of the analysis. The first section describes the methods used in the aggregate data analysis of internal migration flows. The second section sets out the approach to exploring the average differences in employment outcomes between movers and stayers, taking into account differences in motivation. The final section discusses the methods used to assess differences in employment outcomes between movers from, and stayers in, deprived areas. We also present some additional findings that complement the main outcomes of the study, which can be found in the main research report.

## Internal migration flows by typology: overview

To calculate internal migration flows we use Office for National Statistics (ONS) annual internal migration estimates. These include moves between different geographic areas within the UK based on information derived from the NHS Patient Register, the NHS Central Register (NHSCR) and the Higher Education Statistics Agency (HESA).<sup>13</sup> The moves are within and between local authorities in England and Wales, and also to and from Scotland and Northern Ireland.<sup>14</sup> A breakdown by gender and age is also provided. This dataset covers the period from 2011 to 2018 and provides the most accurate data available on internal migration within the UK. We use this source to gain a better understanding of internal migration flows between different types of area. To derive internal migration rates, we use the population size of the sending local authority as the denominator. These data are obtained from NOMIS.<sup>15</sup>

Migration theory explains flows between different localities as the result of both push and pull factors in sending and receiving areas, as well as of the costs of migration. Pull and push factors attract internal migrants to a new area and push them away from the origin area, respectively. The pull and push factors that we consider are the unemployment rates of the sending and receiving areas, deflated gross value added (GVA) per capita and average house prices in both areas.

We also consider the demographic structure of sending areas, as some age groups are more mobile than others. As most migrations happen in early adulthood, we include in our analysis the percentage of people who are aged between 15 and 29 years old, as well as the

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<sup>13</sup> [www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/migrationwithintheuk](http://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/migrationwithintheuk).

<sup>14</sup> The migrations towards Scotland and Northern Ireland are not broken down by area; this means they cannot be used for the analysis that breaks down areas by typology/level of deprivation.

<sup>15</sup> <https://www.nomisweb.co.uk/>

dependency ratio.<sup>16</sup> We also include the percentage of international migrants in the sending area, as they could potentially be more mobile than natives due to having a lower attachment to one particular location. Our qualitative research indicated that one of the main barriers to internal migration was having children. To control for this, we include the fertility rate of the sending area.

Finally, focus group participants who lived in cold spots with good transport links felt it unnecessary to migrate to another area for work, as they could commute. To capture this effect, as well as the fact that many areas of the same type are geographically clustered, we include an indicator that shows whether two local authorities share a border, as well as a continuous variable that captures the distance between areas.<sup>17</sup> The distance between the sending and receiving areas is also a proxy for the costs of migration. All the data described above are available from the ONS website.

We use ONS internal migration flows between local authorities to investigate the patterns of internal migration between different area types. The main focus is on migration patterns between hot and cold spots; however, the flows between areas by the level of deprivation and by ONS typology are also discussed, to explore whether the main findings hold when varying the approach to defining area types.

## Internal migration flows by hot/cold spots: methodology

### Data

In its State of the Nation 2017 report, the Social Mobility Commission introduced the Social Mobility Index, which categorised areas by their social mobility prospects using 16 performance indicators. These indicators are as follows:

- nursery quality
- early years attainment
- primary and secondary school quality
- school quality
- KS2 attainment
- GCSE scores of disadvantaged children
- progress to a positive destination after KS4
- KS5 attainment
- Level 3 attainment

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<sup>16</sup> This is the number of people over 65 years old divided by the number of people who are between 18 and 64 years old in the area.

<sup>17</sup> The distance variable measures the distance between the centres of local authority districts.

- higher education participation
- top selective higher education participation (most selective third by UCAS tariff scores)
- wages
- housing affordability
- occupation
- living wage
- family home ownership

Using these indicators, local authorities are categorised as ‘hot spots’, i.e. areas where intergenerational social mobility is most likely to occur, and ‘cold spots’, i.e. areas where intergenerational social mobility is least likely to occur. These classifications are constructed for localities in England, Wales and Scotland.<sup>18</sup>

## Methods

In this section we explain our methodological approach to the descriptive analysis of the flows between different types of areas, as well as our approach to the regression analysis. In the results section we discuss only estimated coefficients that are statistically significant at 5% level.

## Descriptive analysis

The formula used to calculate the internal migration rate from area k to area m at year t is:

$$\frac{\text{Moves}_{km,t}}{\text{Population}_{k,t}}$$

where Moves is the number of people moving between two different types of area at year t, and Population is the population size of the sending area k at year t. For the hot/cold spot specification, this is  $k, m = \{\text{Hot, Medium, Cold}\}$  and  $t = [2017, 2018]$ .

We look at flow rates over the whole observed period and by year. We also look at flows by gender, and finally by five-year age group bands. The formula was adjusted per type of flow; for example, for female flows between areas k and m at time t:

$$\frac{\text{Female Moves}_{km,t}}{\text{Female Population}_{k,t}}$$

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<sup>18</sup> This indicator is not strictly comparable between England, Wales and Scotland, as it was created separately using indices specific to each nation.

## Regression analysis

For the internal migration regression analysis, we use negative binomial regressions to take into account differences in the population sizes of sending areas. We then estimate two specifications:

- Which areas are people most likely to leave?

$$\text{Moves}_{ij,t} = a + b * \text{Sending}_k + c_1 * \text{GeoP}_{ij} + c_2 * \text{Dem}_{i,t} + c_3 * \text{Push}_{i,t} + c_4 * \text{Pull}_{j,t} + u_{ij,t}$$

- Which areas are people most likely to go to (separately by sending typology)?

$$\text{Moves}_{ij,t} = a + b * \text{Receiving}_m + c_1 * \text{GeoP}_{ij} + c_2 * \text{Dem}_{i,t} + c_3 * \text{Push}_{i,t} + c_4 * \text{Pull}_{j,t} + u_{ij,t}$$

for a given  $k$  (sending area type), where  $i$  is the sending local authority,  $j$  is the receiving local authority and  $t$  is the year of the move.  $\text{Moves}_{ij,t}$  is the flow rate between the sending local authority and the receiving local authority at time  $t$ .

In the first regression specification, the categorical variable  $\text{Sending}_k$  captures the differences in outflows between the different typologies. In our analysis, the reference category is outflows from hot spots, as we control for outflows from medium spots and cold spots.

In the second regression specification, we run the analysis separately for each type of sending area. The categorical variable  $\text{Receiving}_m$  captures the differences in inflows between the different area types. In our analysis the reference category is inflows into hot spots, as we control for inflows into medium spots and cold spots.

The rest of the controls, which are common across the two regression specifications, are listed in Table 1.<sup>19</sup>

**Table 1: Description of control variables for the aggregate data analysis**

Variable category	Variable description	Range of values
$\text{GeoP}_{ij}$	Shared border between sending local authority and receiving local authority	0 if the local authorities do not share a border; 1 if they do share a border
$\text{GeoP}_{ij}$	Distance between sending local authority and receiving local authority	Distance in miles from local authority centroids
$\text{Dem}_{i,t}$	Proportion of population in the sending local authority who are young	Number of people aged between 15 and 19 divided by total population of local authority

<sup>19</sup> We also control for year effects.



Variable category	Variable description	Range of values
$Dem_{i,t}$	Dependency ratio in the sending local authority	Number of people over 65 years of age divided by the number between the ages of 18 and 64
$Dem_{i,t}$	Total fertility rate in sending local authority	A summary measure of period fertility that accounts for the size and age structure of the female population of childbearing age*
$Dem_{i,t}$	Proportion of international migrants in the sending local authority	The number of people born outside the UK in the local authority divided by the total population of the local authority
$Push_{i,t}$ and $Pull_{j,t}$	Unemployment rate of the sending and the receiving local authorities	Number of unemployed people divided by the number of people who are either employed or are searching for a job
$Push_{i,t}$ and $Pull_{j,t}$	Real GVA per capita of the sending and the receiving local authorities	The value generated by any unit engaged in the production of goods and services in the local authority, deflated and per head
$Push_{i,t}$ and $Pull_{j,t}$	Mean house prices in the sending and the receiving local authority	Mean price paid for houses by local authority

Notes: \* More details on how this measure is calculated can be found at [www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates](http://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates).

We take the logarithm of the distance between the sending and receiving local authorities, average house prices, real GVA per capita, and the proportion of the population between the ages of 15 and 29. Instead of using current values, we include the one-year lagged values of all the control variables (apart from border and distance, which do not change over time) to reflect the fact that previous conditions determine current migration flows.

As the hot/cold spot indicators for England, Scotland and Wales are not comparable, we analyse internal migration flows within England. Given that the indicator was constructed in 2017, we run the analysis for the years from 2017 to 2018 for this particular specification.

In our regression analysis we specify four models:

- Model 1: controlling only for the area type (Sending<sub>k</sub> if we are estimating which areas people are most likely to leave and Receiving<sub>m</sub> if we are estimating which areas people are most likely to go to)
- Model 2: controlling also for whether the two areas share a border, and the distance between them (Sending<sub>k</sub> and GeoP<sub>ij</sub> for the first specification and Receiving<sub>m</sub> and GeoP<sub>ij</sub> for the second specification)
- Model 3: controlling also for the demographic structure of the sending local authorities (Sending<sub>k</sub>, GeoP<sub>ij</sub> and Dem<sub>i,t</sub> for the first specification and Receiving<sub>m</sub>, GeoP<sub>ij</sub> and Dem<sub>i,t</sub> for the second specification)
- Model 4: controlling also for the push and pull factors of the sending and receiving local authorities (Push<sub>i,t</sub> and Pull<sub>j,t</sub>) (Sending<sub>k</sub>, GeoP<sub>ij</sub>, Dem<sub>i,t</sub>, Push<sub>i,t</sub> and Pull<sub>j,t</sub> for the first specification and Receiving<sub>m</sub>, GeoP<sub>ij</sub>, Dem<sub>i,t</sub> and Push<sub>i,t</sub> and Pull<sub>j,t</sub> for the second specification)

## Internal migration flows by hot/cold spots: additional results

To gain a better understanding of the directions of outflows and inflows, and the degree to which there is a high flow between less advantaged and more advantaged areas, we investigated the internal migration flows between different localities. Someone from a cold spot is more likely to migrate to a medium spot than to another a cold spot. This is partly because there are a greater number of medium spots that could serve as potential destinations. To examine whether the higher flows towards mediums spots are due to the greater attractiveness of these destinations, we used regression analysis to investigate the intensity of pairwise flows.

In this section we provide some additional regression results that complement the main report. Table 2 shows the regression results for the relative outflow rates from hot/cold spots by area type and the coefficients of the rest of the controls.

**Table 2: Migration outflow rates from hot/cold spots, by area characteristics**

	Model 1	Model 2	Model 3	Model 4
<b>Sending: medium spot</b>	-0.332*** (0.029)	-0.028** (0.013)	0.060*** (0.016)	0.038** (0.016)
<b>Sending: cold spot</b>	-0.423*** (0.040)	-0.235*** (0.015)	-0.281*** (0.019)	-0.038** (0.019)
<b>Share border</b>		1.793*** (0.025)	1.940*** (0.028)	1.984*** (0.027)

	Model 1	Model 2	Model 3	Model 4
<b>Distance between sending and receiving areas</b>		-0.957*** (0.007)	-0.909*** (0.007)	-0.945*** (0.007)
<b>Young population ratio aged 15-29, sending area</b>			2.159*** (0.053)	2.002*** (0.050)
<b>Dependency ratio, sending area</b>			1.115*** (0.115)	2.343*** (0.106)
<b>Non-UK born ratio, sending area</b>			1.650*** (0.077)	0.277*** (0.084)
<b>Fertility rate, sending area</b>			-0.125*** (0.035)	0.173*** (0.035)
<b>Unemployment rate, sending area</b>				-0.073*** (0.005)
<b>Unemployment rate, receiving area</b>				0.159*** (0.003)
<b>GVA per capita, sending area</b>				-0.067*** (0.017)
<b>GVA per capita, receiving area</b>				0.376*** (0.014)
<b>House prices, sending area</b>				0.386*** (0.020)
<b>House prices, receiving area</b>				-0.109*** (0.011)

	Model 1	Model 2	Model 3	Model 4
<b>Observations</b>	94,863	94,863	94,863	94,863

Source: ONS internal migration flows, England 2017 to 2018; NOMIS 2016 to 2017

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 .

Unlike the descriptive pairwise rates, the regressions show the proportion of flows between different types of area without being affected by the number of local authorities in each categorisation. Table 3,

Table 4 and Table 5 show the internal migration flows for each sending typology. Table 3 shows migration outflows from hot spots towards all possible receiving areas (hot, medium and cold spots), and similarly

Table 4 shows migration outflows from medium spots and Table 5 migration flows from cold spots.

**Table 3: Internal migration flow rates by receiving typology (sending typology: hot spot)**

	Model 1	Model 2	Model 3	Model 4
<b>Receiving: medium spot</b>	-1.114*** (0.049)	0.435*** (0.023)	0.426*** (0.023)	0.630*** (0.027)
<b>Receiving: cold spot</b>	-1.647*** (0.074)	0.086*** (0.032)	0.080** (0.032)	0.217*** (0.034)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions</b>	NO	NO	NO	YES
<b>Observations</b>	20,085	20,085	20,085	20,085

Source: ONS internal migration flows, England 2017 to 2018; NOMIS 2016 to 2017

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 4: Internal migration flow rates by receiving typology (sending typology: medium spot)**

	Model 1	Model 2	Model 3	Model 4
<b>Receiving: medium spot</b>	0.270*** (0.038)	0.111*** (0.017)	0.202*** (0.013)	0.457*** (0.016)
<b>Receiving: cold spot</b>	-0.036 (0.058)	-0.194*** (0.019)	-0.085*** (0.016)	0.131*** (0.019)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions</b>	NO	NO	NO	YES
<b>Observations</b>	55,929	55,929	55,929	55,929

Source: ONS internal migration flows, England 2017 to 2018; NOMIS 2016 to 2017

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 5: Internal migration flow rates by receiving typology (sending typology: cold spot)**

	Model 1	Model 2	Model 3	Model 4
<b>Receiving: medium spot</b>	0.496*** (0.082)	0.235*** (0.027)	0.322*** (0.022)	0.470*** (0.027)
<b>Receiving: cold spot</b>	1.075*** (0.096)	0.049 (0.031)	0.146*** (0.027)	0.228*** (0.033)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions</b>	NO	NO	NO	YES
<b>Observations</b>	18,849	18,849	18,849	18,849

Source: ONS internal migration flows, England 2017 to 2018; NOMIS 2016 to 2017

Notes: Robust standard errors in parentheses; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## Internal migration flows by ONS typology: methodology

### Data

We investigate the internal migration flows by ONS typology. There are eight ONS typologies:

- Affluent England
- Business, Education and Heritage Centres
- Countryside Living
- Ethnically Diverse Metropolitan Living
- London Cosmopolitan
- Services and Industrial Legacy
- Town and Country Living
- Urban Settlements

These area classifications were created using the 2011 census and information on demographic, household, housing, socio-economic and employment characteristics of local authorities. Similar areas are clustered together under one of the eight categories.<sup>20</sup> All of these area types can be found in England, but Affluent England, Ethnically Diverse Metropolitan Living and London Cosmopolitan areas cannot be found in Wales. For the internal migration flows between and within England and Wales, we consider all eight types of area.

### Methods

The methodological approach to the analysis based on ONS typologies is the same as the one described above for hot and cold spots. The ONS typologies were defined in 2011, so we are able to look at migration flows between 2011 and 2018. We also include migration flows between and within England and Wales, since this index is compatible over the two countries. We include year effects and country fixed effects as well.

## Internal migration flows by ONS typology: additional results

In Table 6 we see a breakdown of area characteristics for each of the ONS area types. London Cosmopolitan; Business Education and Heritage Centre; and Ethnically Diverse Metropolitan Living areas have fewer old-age dependents per member of the working-age population, as well

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<sup>20</sup><https://www.ons.gov.uk/methodology/geography/geographicalproducts/areaclassifications/2011areaclassifications/abouttheareaclassifications>

as more international migrants and higher levels of unemployment. Relative productivity is also higher in these areas (GVA per capita), as are housing costs.

**Table 6: Descriptive statistics of pull/push factors by ONS typology**

	Average unemployment rate	Average house prices (£)	Average GVA per capita (£)	Young population rate	Fertility rate	Dependency ratio	International migration ratio
<b>Affluent England</b>	3.8	393,299	28,728	0.2	1.9	0.3	0.1
<b>Business, Education and Heritage Centre</b>	6.3	238,853	27,843	0.3	1.6	0.2	0.2
<b>Countryside Living</b>	4.6	232,504	19,046	0.2	1.8	0.4	0.1
<b>Ethnically Diverse Metropolitan Living</b>	7.6	351,499	24,689	0.2	2	0.2	0.4
<b>London Cosmopolitan</b>	7.3	797,203	726,621	0.2	1.4	0.1	0.4
<b>Services and Industrial Legacy</b>	7.2	142,079	18,145	0.2	1.8	0.3	0.0
<b>Town and Country Living</b>	4.6	217,633	21,272	0.2	1.8	0.3	0.1
<b>Urban Settlements</b>	6.6	190,380	23,293	0.2	2	0.3	0.1

Source: ONS, England, years 2011 to 2018

Table 7 shows the likelihood of moving from each of the eight ONS area types over the period 2011 to 2018. The reference category is Affluent England.

**Table 7: Internal migration outflow rates, controlling for sending ONS typology, reference group Affluent England**

	Model 1	Model 2	Model 3	Model 4
<b>Sending: Business, Education and Heritage Centres</b>	0.222*** (0.019)	0.515*** (0.008)	0.386*** (0.014)	0.207*** (0.011)
<b>Sending: Countryside Living</b>	-0.284***	0.038***	0.187***	0.149***

	Model 1	Model 2	Model 3	Model 4
	(0.017)	(0.007)	(0.011)	(0.010)
<b>Sending: Ethnically Diverse Metropolitan Living</b>	0.218*** (0.022)	-0.030*** (0.010)	0.421*** (0.017)	-0.092*** (0.015)
<b>Sending: London Cosmopolitan</b>	0.513*** (0.028)	-0.002 (0.013)	-0.137*** (0.022)	-0.376*** (0.019)
<b>Sending: Services and Industrial Legacy</b>	-0.558*** (0.022)	-0.545*** (0.008)	-0.408*** (0.009)	-0.216*** (0.010)
<b>Sending: Town and Country Living</b>	-0.231*** (0.018)	-0.339*** (0.007)	-0.316*** (0.008)	-0.195*** (0.008)
<b>Sending: Urban Settlements</b>	-0.239*** (0.018)	-0.289*** (0.007)	-0.226*** (0.008)	-0.076*** (0.009)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions</b>	NO	NO	NO	YES
<b>Observations</b>	560,504	560,504	560,504	560,504

Source: ONS internal migration rates, England and Wales, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 8 to Table 15 below show the likelihood of moving to each of the different types of area from each type of sending area. Moves from London Cosmopolitan and Ethnically Diverse Metropolitan Living areas may often be over short distances, for instance within the boundaries of Greater London, so their coefficients become smaller once we add controls for distance. Controlling for the demographic characteristics of the sending area and the relative economic activity and living costs of the sending and receiving areas accounts for some of the variation in outflows from some of the area types.



**Table 8: Internal migration flow rates, sending typology Affluent England, controlling for destination ONS typology**

	Model 1	Model 2	Model 3	Model 4
<b>Receiving: Business, Education and Heritage Centres</b>	-0.162*** (0.032)	1.415*** (0.014)	1.422*** (0.014)	1.261*** (0.015)
<b>Receiving: Countryside Living</b>	-1.358*** (0.030)	0.454*** (0.014)	0.463*** (0.014)	0.488*** (0.015)
<b>Receiving: Ethnically Diverse Metropolitan Living</b>	-0.428*** (0.038)	0.227*** (0.021)	0.224*** (0.021)	0.070*** (0.020)
<b>Receiving: London Cosmopolitan</b>	-0.218*** (0.027)	0.530*** (0.016)	0.534*** (0.015)	0.396*** (0.023)
<b>Receiving: Services and Industrial Legacy</b>	-2.343*** (0.046)	-0.212*** (0.020)	-0.207*** (0.020)	-0.356*** (0.022)
<b>Receiving: Town and Country Living</b>	-1.432*** (0.038)	-0.129*** (0.015)	-0.121*** (0.015)	-0.154*** (0.016)
<b>Receiving: Urban Settlements</b>	-1.240*** (0.041)	-0.304*** (0.014)	-0.301*** (0.014)	-0.473*** (0.016)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	85,550	85,550	85,550	85,550

Source: ONS internal migration rates, England and Wales, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 9: Internal migration flow rates, sending typology Business, Education and Heritage Centres, controlling for destination ONS typology**

	Model 1	Model 2	Model 3	Model 4
<b>Receiving: Business, Education and Heritage Centres</b>	0.507*** (0.054)	1.095*** (0.016)	1.113*** (0.015)	1.032*** (0.017)
<b>Receiving: Countryside Living</b>	-0.197*** (0.068)	-0.119*** (0.017)	-0.083*** (0.017)	0.070*** (0.019)
<b>Receiving: Ethnically Diverse Metropolitan Living</b>	0.291*** (0.053)	0.774*** (0.017)	0.782*** (0.016)	0.571*** (0.019)
<b>Receiving: London Cosmopolitan</b>	0.732*** (0.054)	1.334*** (0.022)	1.318*** (0.020)	0.791*** (0.030)
<b>Receiving: Services and Industrial Legacy</b>	-0.464*** (0.071)	-0.408*** (0.019)	-0.378*** (0.018)	-0.291*** (0.022)
<b>Receiving: Town and Country Living</b>	-0.240*** (0.071)	-0.428*** (0.015)	-0.407*** (0.014)	-0.271*** (0.017)
<b>Receiving: Urban Settlements</b>	-0.407*** (0.058)	-0.260*** (0.013)	-0.237*** (0.012)	-0.235*** (0.016)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	49,619	49,619	49,619	49,619

Source: ONS internal migration rates, England and Wales, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 10: Internal migration flow rates, sending typology Countryside Living, controlling for destination ONS typology**

	Model 1	Model 2	Model 3	Model 4
<b>Receiving: Business, Education and Heritage Centres</b>	1.622*** (0.042)	1.326*** (0.013)	1.339*** (0.013)	1.097*** (0.015)
<b>Receiving: countryside Living</b>	1.081*** (0.040)	0.512*** (0.014)	0.523*** (0.013)	0.477*** (0.015)
<b>Receiving: Ethnically Diverse Metropolitan Living</b>	0.134*** (0.037)	0.409*** (0.018)	0.404*** (0.018)	0.229*** (0.018)
<b>Receiving: London Cosmopolitan</b>	0.511*** (0.033)	0.926*** (0.016)	0.950*** (0.016)	0.755*** (0.024)
<b>Receiving: Services and Industrial Legacy</b>	0.408*** (0.054)	0.020 (0.015)	0.009 (0.015)	-0.230*** (0.019)
<b>Receiving: Town and Country Living</b>	0.423*** (0.042)	0.041*** (0.014)	0.037*** (0.013)	-0.043*** (0.016)
<b>Receiving: Urban Settlements</b>	0.222*** (0.054)	-0.060*** (0.014)	-0.072*** (0.013)	-0.306*** (0.017)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	100,590	100,590	100,590	100,590

Source: ONS internal migration rates, England and Wales, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 11: Internal migration flow rates, sending typology Ethnically Diverse Metropolitan Living, controlling for destination ONS typology**

	Model 1	Model 2	Model 3	Model 4
<b>Receiving: Business, Education and Heritage Centres</b>	0.015 (0.047)	1.363*** (0.024)	1.363*** (0.024)	1.014*** (0.024)
<b>Receiving: Countryside Living</b>	-1.708*** (0.046)	-0.165*** (0.025)	-0.168*** (0.025)	-0.196*** (0.024)
<b>Receiving: Ethnically Diverse metropolitan living</b>	1.536*** (0.057)	1.223*** (0.032)	1.235*** (0.032)	0.719*** (0.030)
<b>Receiving: London Cosmopolitan</b>	1.196*** (0.058)	0.621*** (0.025)	0.632*** (0.026)	0.196*** (0.037)
<b>Receiving: Services and Industrial Legacy</b>	-1.980*** (0.051)	-0.221*** (0.028)	-0.221*** (0.028)	-0.577*** (0.031)
<b>Receiving: Town and Country Living</b>	-1.254*** (0.072)	-0.382*** (0.023)	-0.379*** (0.023)	-0.422*** (0.024)
<b>Receiving: Urban Settlements</b>	-0.161** (0.065)	0.449*** (0.023)	0.452*** (0.023)	0.075*** (0.026)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	32,509	32,509	32,509	32,509

Source: ONS internal migration rates, England and Wales, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 12: Internal migration flow rates, sending typology London Cosmopolitan, controlling for destination ONS typology**

	Model 1	Model 2	Model 3	Model 4
<b>Receiving: Business, Education and Heritage Centres</b>	0.304*** (0.040)	1.213*** (0.029)	1.219*** (0.029)	1.149*** (0.029)
<b>Receiving: Countryside Living</b>	-1.501*** (0.035)	-0.396*** (0.026)	-0.393*** (0.025)	-0.272*** (0.025)
<b>Receiving: Ethnically Diverse Metropolitan Living</b>	1.893*** (0.055)	1.085*** (0.030)	1.097*** (0.029)	0.952*** (0.034)
<b>Receiving: London Cosmopolitan</b>	2.755*** (0.047)	1.313*** (0.033)	1.343*** (0.034)	0.664*** (0.047)
<b>Receiving: Services and Industrial Legacy</b>	-2.180*** (0.041)	-0.779*** (0.039)	-0.778*** (0.038)	-0.489*** (0.040)
<b>Receiving: Town and Country Living</b>	-1.681*** (0.038)	-0.727*** (0.029)	-0.728*** (0.029)	-0.448*** (0.029)
<b>Receiving: Urban Settlements</b>	-0.752*** (0.046)	-0.248*** (0.025)	-0.252*** (0.024)	0.023 (0.028)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	18,821	18,821	18,821	18,821

Source: ONS internal migration rates, England and Wales, 2011 to 2018; Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 13: Internal migration flow rates, sending Typology Services and Industrial Legacy, controlling for destination ONS typology**

	Model 1	Model 2	Model 3	Model 4
<b>Receiving: Business, Education and Heritage Centres</b>	2.296*** (0.076)	1.310*** (0.018)	1.317*** (0.018)	0.923*** (0.019)
<b>Receiving: Countryside Living</b>	1.165*** (0.079)	0.351*** (0.019)	0.385*** (0.019)	0.296*** (0.021)
<b>Receiving: Ethnically Diverse Metropolitan Living</b>	0.851*** (0.081)	0.885*** (0.024)	0.899*** (0.023)	0.541*** (0.027)
<b>Receiving: London Cosmopolitan</b>	0.762*** (0.063)	1.245*** (0.028)	1.259*** (0.026)	0.867*** (0.036)
<b>Receiving: Services and Industrial Legacy</b>	2.174*** (0.072)	0.221*** (0.020)	0.226*** (0.019)	-0.172*** (0.025)
<b>Receiving: Town and Country Living</b>	1.311*** (0.077)	-0.097*** (0.018)	-0.088*** (0.017)	-0.201*** (0.020)
<b>Receiving: Urban Settlements</b>	1.115*** (0.077)	0.105*** (0.017)	0.114*** (0.017)	-0.276*** (0.020)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	72,897	72,897	72,897	72,897

Source: ONS internal migration rates, England and Wales, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 14: Internal migration flow rates, sending typology Town and Country Living, controlling for destination ONS typology**

	Model 1	Model 2	Model 3	Model 4
<b>Receiving: Business, Education and Heritage Centres</b>	1.363*** (0.054)	1.452*** (0.012)	1.463*** (0.012)	1.119*** (0.013)
<b>Receiving: Countryside Living</b>	0.298*** (0.047)	0.682*** (0.014)	0.698*** (0.014)	0.554*** (0.015)
<b>Receiving: Ethnically Diverse Metropolitan Living</b>	0.809*** (0.105)	0.569*** (0.016)	0.559*** (0.016)	0.324*** (0.017)
<b>Receiving: London Cosmopolitan</b>	0.280*** (0.042)	1.007*** (0.015)	1.009*** (0.015)	0.902*** (0.021)
<b>Receiving: Services and Industrial Legacy</b>	0.276*** (0.059)	0.083*** (0.015)	0.089*** (0.015)	-0.319*** (0.018)
<b>Receiving: Town and Country Living</b>	0.861*** (0.048)	0.005 (0.012)	0.014 (0.012)	-0.145*** (0.014)
<b>Receiving: Urban Settlements</b>	0.626*** (0.058)	-0.039*** (0.012)	-0.039*** (0.012)	-0.393*** (0.014)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	106,413	106,413	106,413	106,413

Source: ONS internal migration rates, England and Wales, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 15: Internal migration flow rates, sending typology Urban Settlements, controlling for destination ONS typology**

	Model 1	Model 2	Model 3	Model 4
<b>Receiving: Business, Education and Heritage Centres</b>	0.676*** (0.051)	1.515*** (0.014)	1.520*** (0.014)	1.039*** (0.015)
<b>Receiving: Countryside Living</b>	-0.299*** (0.062)	0.650*** (0.015)	0.658*** (0.015)	0.410*** (0.017)
<b>Receiving: Ethnically Diverse Metropolitan Living</b>	0.567*** (0.058)	1.112*** (0.019)	1.129*** (0.018)	0.794*** (0.019)
<b>Receiving: London Cosmopolitan</b>	0.036 (0.045)	0.956*** (0.019)	0.973*** (0.018)	0.911*** (0.025)
<b>Receiving: Services and Industrial Legacy</b>	-0.412*** (0.065)	0.330*** (0.016)	0.336*** (0.016)	-0.287*** (0.020)
<b>Receiving: Town and Country Living</b>	0.053 (0.054)	0.093*** (0.014)	0.099*** (0.014)	-0.154*** (0.016)
<b>Receiving: Urban Settlements</b>	0.397*** (0.052)	0.408*** (0.014)	0.419*** (0.014)	-0.108*** (0.016)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	94,105	94,105	94,105	94,105

Source: ONS internal migration rates, England and Wales, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



## Internal migration flows by level of deprivation: methodology

### Data

We use the index of multiple deprivation, which is constructed from a series of measures that capture the income level of the local population, employment, education and skills, health, crime, barriers to housing and services, and the quality of the indoor and outdoor living environment. Local authorities in England are ranked based on their total score. For this analysis we split local authorities into five groups based on the deprivation quintile to which they belong. These five categories are referred to as high deprivation; second quintile; third quintile; fourth quintile; and low deprivation.

The descriptive analysis includes a breakdown of moves by year, gender and age group. For this specific typology, we use the census 2011 data on migration outflows from local authorities from NOMIS to look at migration flows out of, and into, deprived areas by socio-economic status and by ethnicity. The socio-economic status used is the National Statistics Socio-economic Classification (NS-SEC), which is an ONS standard classification that provides an indication of socio-economic position based on occupation.<sup>21</sup> We use the three-class version of the classification (for a detailed breakdown of the classes see Table 0.1 in the Annex), and we also report the percentages of long-term unemployed/never employed and full time students within areas. The ethnicity variable is split into 'white' and 'non-white'.

### Methods

The methodological approach to the analysis of migration flows by deprivation level is again the same as the one used for the hot/cold spot analysis. The deprivation indices for England and Wales are not comparable, so we restrict this part of the analysis to England. We use the 2010 index of multiple deprivation, which allows us to look at internal migration flows over the period 2011 to 2018. We include year effects and country fixed effects.

## Internal migration flows by level of deprivation: additional results

Table 16 to Table 20 below show the likelihood of moving to each of the different types of area from each type of sending area.

**Table 16: Internal migration outflow rates, sending typology high deprivation, controlling for destination typology**

	Model 1	Model 2	Model 3	Model 4
<b>2nd quintile</b>	-0.543*** (0.033)	-0.052*** (0.014)	-0.048*** (0.013)	0.161*** (0.013)

<sup>21</sup> <https://webarchive.nationalarchives.gov.uk/20160106042025/http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/soc2010/soc2010-volume-3-ns-sec--rebased-on-soc2010--user-manual/index.html>

	Model 1	Model 2	Model 3	Model 4
<b>3rd quintile</b>	-0.781*** (0.042)	-0.708*** (0.013)	-0.707*** (0.012)	-0.358*** (0.014)
<b>4th quintile</b>	-1.120*** (0.042)	-0.788*** (0.013)	-0.790*** (0.013)	-0.358*** (0.015)
<b>Low deprivation</b>	-1.450*** (0.047)	-1.089*** (0.013)	-1.115*** (0.012)	-0.690*** (0.016)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	98,973	98,973	98,973	98,973

Source: ONS internal migration rates, England, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 17: Internal migration outflow rates, sending typology 2nd quintile, controlling for destination typology**

	Model 1	Model 2	Model 3	Model 4
<b>2nd quintile</b>	-0.062* (0.036)	0.123*** (0.015)	0.134*** (0.014)	0.307*** (0.014)
<b>3rd quintile</b>	-0.500*** (0.037)	-0.526*** (0.014)	-0.519*** (0.012)	-0.237*** (0.014)
<b>4th quintile</b>	-0.422*** (0.042)	-0.478*** (0.014)	-0.475*** (0.013)	-0.134*** (0.016)
<b>Low deprivation</b>	-0.497*** (0.046)	-0.699*** (0.013)	-0.728*** (0.012)	-0.433*** (0.017)

	Model 1	Model 2	Model 3	Model 4
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	94,894	94,894	94,894	94,894

Source: ONS internal migration rates, England, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 18: Internal migration outflow rates, sending typology 3rd quintile, controlling for destination typology**

	Model 1	Model 2	Model 3	Model 4
<b>2nd quintile</b>	-0.057 (0.037)	0.208*** (0.016)	0.232*** (0.014)	0.349*** (0.014)
<b>3rd quintile</b>	-0.163*** (0.042)	-0.443*** (0.015)	-0.424*** (0.013)	-0.233*** (0.015)
<b>4th quintile</b>	-0.147*** (0.042)	-0.409*** (0.015)	-0.401*** (0.013)	-0.173*** (0.017)
<b>Low deprivation</b>	-0.464*** (0.048)	-0.657*** (0.015)	-0.684*** (0.012)	-0.490*** (0.018)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	92,675	92,675	92,675	92,675

Source: ONS internal migration rates, England, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 19: Internal migration outflow rates, sending typology 4th quintile, controlling for destination typology**

	Model 1	Model 2	Model 3	Model 4
<b>2nd quintile</b>	0.112*** (0.042)	0.329*** (0.015)	0.344*** (0.015)	0.487*** (0.015)
<b>3rd quintile</b>	-0.067 (0.046)	-0.353*** (0.013)	-0.349*** (0.013)	-0.119*** (0.015)
<b>4th quintile</b>	-0.140*** (0.042)	-0.219*** (0.015)	-0.213*** (0.014)	0.052*** (0.018)
<b>Low deprivation</b>	-0.092** (0.044)	-0.494*** (0.013)	-0.512*** (0.012)	-0.301*** (0.018)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	87,645	87,645	87,645	87,645

Source: ONS internal migration rates, England, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 20: Internal migration outflow rates, sending typology low deprivation, controlling for destination typology**

	Model 1	Model 2	Model 3	Model 4
<b>2nd quintile</b>	0.358*** (0.047)	0.484*** (0.014)	0.482*** (0.014)	0.577*** (0.014)
<b>3rd quintile</b>	-0.083* (0.048)	-0.187*** (0.013)	-0.188*** (0.013)	-0.020 (0.015)

	Model 1	Model 2	Model 3	Model 4
<b>4th quintile</b>	0.351*** (0.047)	-0.047*** (0.013)	-0.047*** (0.013)	0.151*** (0.016)
<b>Low deprivation</b>	0.704*** (0.045)	-0.309*** (0.012)	-0.311*** (0.012)	-0.152*** (0.017)
<b>Distance and border</b>	NO	YES	YES	YES
<b>Demographic structure of sending</b>	NO	NO	YES	YES
<b>Economic conditions of sending and receiving</b>	NO	NO	NO	YES
<b>Observations</b>	96,465	96,465	96,465	96,465

Source: ONS internal migration rates, England, 2011 to 2018

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## Differences in employment outcomes for movers and stayers: methodology

### Data

The British Household Panel Survey (BHPS) and its successor, the Understanding Society UK Household Longitudinal Study (UKHLS), are household longitudinal surveys covering the periods 1991 to 2008 (BHPS) and 2009 to 2019 (UKHLS). The BHPS is a nationally representative panel dataset that covers more than 5,000 households containing more than 10,000 respondents. As the surveys cover a very long time period, attrition is dealt with through the recruitment of new households at every wave. The UKHLS is a continuation of the BHPS and the two surveys have been harmonised, allowing us to link them to cover the period from 1991 to 2019 in our analysis.

The surveys provide information on the demographic and socio-economic characteristics of individuals. Due to the long time span covered by the surveys, we are able to observe the socio-economic characteristics of parents and those of their children later in life when they are in their 30s, as well as their location. This dataset allows us to explore how the socio-economic status of a child later in life is related to that of their parents, and how this varies not only with the location where the child grew up but also with the area they move to as an adult. By using the Special Licence dataset, we are able to use local authority identifiers that help us determine the effect of geographical movements on social mobility at a more granular level.

The BHPS-UKHLS Special Licence dataset allow us to investigate differences in employment outcomes between movers and stayers, and how these outcomes vary with gender, ethnicity, socio-economic background and educational level. The employment outcomes we focus on are:

- whether the individual is employed
- whether they are employed in a higher managerial or professional job
- their monthly income from work

We compare the employment outcomes of individuals who, as adults, live in the area where they grew up with the outcomes of adults who live in a different area to the one where they grew up. The longitudinal nature of the two harmonised datasets allows us to follow individuals from the age of 15 into adulthood. We use an early observation of the individual (between the ages of 15 and 19) when they still lived with their parents to obtain information on the socio-economic status of their parents and to identify the local authority where they lived at the time. When both parents are present in the household, the parent with the highest socio-economic status is chosen to characterise the socio-economic status of the parents.

We use a later observation (around the age of 30) for our analysis of outcomes. Ideally, we would observe outcomes at the age of 30. However, owing to small sample sizes, where an observation at the age of 30 is not available we use later observations, up to the age of 41. In cases where it is not possible to observe outcomes between the ages of 30 and 41, we use the observation closest to the age of 30, working backwards to the age of 25. If the individual lived in the same local authority both as a young person and as an adult, they are not considered to be a mover. Individuals who live in a different local authority as an adult to the one where they grew up are considered to be movers. Individuals who moved away from the local authority for some time (for example, to attend university) before returning are not regarded as movers. The final sample includes individuals between the ages of 25 and 41 in the years 2000 to 2019.

The analysis includes the controls listed in Table 21, observed in adulthood, at the same time as the outcome measures. The only exceptions to this are the socio-economic status of the parent and the area where the individual grew up, which are obtained from the earlier observation of the individual as a teenager. Due to small sample sizes, we do not look at employment outcomes for those from the most deprived areas only, but instead consider the average differences in employment outcomes for stayers and movers from any type of area. In the results section we only discuss estimated coefficients that are statistically significant at a 5% level.

**Table 21: Variable description for the BHPS-UKHLS analysis**

Variable category	Variable description	Range of values
Outcome	Being employed	1 if they are employed, 0 if they are not employed

Variable category	Variable description	Range of values
Outcome	Employment in higher managerial and professional occupation	1 if they are currently employed (or have been in the past) in a higher managerial, admin or professional occupation, <sup>(i)</sup> 0 if they are currently employed (or have been in the past) in a routine/manual or intermediate occupation
Outcome	Monthly income	Total monthly labour income (gross) in real terms
Migrant <sub>i</sub>	Mover	1 if they live in a different local authority to the one they grew up in, 0 if they live in the same local authority to the one they grew up
Demo <sub>i</sub>	Gender (male)	1 for male, 0 for female
Demo <sub>i</sub>	Age	The age of the individual as an adult
Demo <sub>i</sub>	Ethnicity (white)	1 if they are white British, 0 if they are white non-British or non-white
Demo <sub>i</sub>	Marital status	1 if they are married or registered in a same sex civil partnership, 0 otherwise
Demo <sub>i</sub>	Children	1 if they have own children in the household under the age of 16, 0 if they do not have own children in the household under the age of 16 <sup>(ii)</sup>
Demo <sub>i</sub>	Number of children	Number of own children in the household under the age of 16
Demo <sub>i</sub>	Education (degree)	1 if their highest qualification is a degree or other higher degree, 0 if their highest qualification is A levels, GCSE, other or no qualification

Variable category	Variable description	Range of values
Demo <sub>i</sub>	House tenure	1 if they own their house outright or with mortgage, 0 if they do not
Demo <sub>i</sub>	Born out of the UK	1 if they were born out of the UK, 0 if they were born in the UK
Demo <sub>i</sub>	Socio-economic status of parent	Three-class NS-SEC specification (Table 0.1): (1) Higher managerial, administrative and professional occupations; (2) intermediate occupations; (3) routine and manual occupations
Distance <sub>km</sub>	Distance between areas	Distance in miles from local authority centroids between the area they grew up (k) and the area they live now (m); 0 for stayers
Macro <sub>k</sub>	Local authority unemployment rate	Number of unemployed people divided by the number of people who are either employed or searching for a job
Macro <sub>k</sub>	Proportion of professionals within the local authority	The proportion of the top two groups of the major group Social Occupational Classification <sup>(iii)</sup>
$\gamma$	Regional fixed effects	Government office region fixed effects
t	Year effects	Year effects

Notes: (i) the equivalent of the top class of the three-class NS-SEC specification (Table 0.1); (ii) includes natural children, adopted children and step-children; (iii) the UK Standard Occupational Classification (SOC) system is used to classify workers by their occupations. Jobs are classified by their skill level and content: [www.hesa.ac.uk/support/documentation/industrial-occupational](http://www.hesa.ac.uk/support/documentation/industrial-occupational) (Table 0.2).

We also address the issue of unobserved motivation by using proxy variables on questions that were asked when the individual was still a teenager, shown in Table 22.<sup>22</sup>

<sup>22</sup> A similar approach was followed by Gordon, I. (2015). Ambition, human capital acquisition and the metropolitan escalator, *Regional Studies*, 49(6), 1042–1055.



**Table 22: Motivation question variables**

What is the most important reason for	What is the most important aspect of a job?
Work is the normal thing to do	Promotion prospects
To pay for essentials	Total pay
To earn money to buy extras	Good relations with manager
To earn money of my own	Job security
For the company of other people	Using own initiative
Enjoy working	The work itself
To follow my career	The hours of work
Other	Something else

The same two questions with the same response categories are also asked about the second most important reason for wanting a job and aspect of the job. We control for the second most important reasons in the analysis as well.

## Methods

### Basic specification

The basic specification we are estimating is the following:

$$y_i = a + b * \text{Migrant}_i + c * \text{Demo}_i + d * \text{Macro}_k + e * \text{Distance}_{km} + \gamma + t + \varepsilon_i$$

where  $y_i$  is the employment outcome of person  $i$ ,  $\text{Migrant}_i$  indicates whether the person is a mover or not,  $\text{Demo}_i$  is the demographic and individual characteristics of the person,  $\text{Macro}_k$  is the macroeconomic controls of the area  $k$  where the person lives as an adult,  $\text{Distance}_{km}$  is the distance between the area a person lives in as an adult and the area where they grew up,  $\gamma$  is the regional fixed effects, and  $t$  is the year effects.

Two of our employment outcomes (being employed and being employed in a higher managerial, administrative or professional occupation) are binary, and the third (monthly labour market income) is continuous. The first two models are estimated using probit regressions, with marginal effects reported, and the third model is estimated using OLS.

In our regression analysis we specify three models:

- Model 1: controlling only for migrant status,  $Distance_{km}$ , regional fixed effects and year effects
- Model 2: controlling for migrant status,  $Distance_{km}$ , regional fixed effects, year effects and  $Macro_k$
- Model 3: controlling for migrant status,  $Distance_{km}$ , regional fixed effects, year effects,  $Macro_k$  and  $Demo_i$

Next we move to another specification where we investigate differences in employment outcomes between stayers and movers by different individual characteristics using multivariate analysis. To do so, we include an interaction between migrant status and the individual characteristic of interest. The characteristics we consider in this part of the analysis are gender, ethnicity, education level and socio-economic background. The specification is:

$$y_i = a + b_1 * Migrant_i + b_2 Characteristic_i + b_3 Migrant_i * Characteristic_i + c * Demo'_i + d * Macro_k + e * Distance_{km} + \gamma + \tau + \varepsilon_i$$

where  $Characteristic_i$  is either gender, ethnicity, education level or socio-economic background and  $Demo'_i$  is the group of individual characteristics minus the one included in the interaction. We use the third model specification for this part of the analysis.

After estimating differences in outcomes by migrant status and other characteristics, we check if these estimated differences are statistically significant. For example, we estimate the difference in the probability of employment for movers who are degree holders versus stayers who are also degree holders and the difference in the probability of employment for movers who do not have a degree and stayers who also do not have a degree. Having estimated the effect of migrant status on the employment outcome separately for degree holders and for non-degree holders, we test whether migrant status has a stronger effect on the outcomes experienced by one group (degree holders) compared with the other (those with no degree).

### **Multivariate analysis: addressing unobserved motivation**

For this part of the analysis we use the third model of the basic specification set out above and control for motivation in the way described above. Finally, using the interaction model specification for the differences between movers and stayers by individual characteristics, we repeat the analysis including the motivation variables.

## **Differences in employment outcomes for movers and stayers: additional results**

Table 23 presents a description of the characteristics of the individuals in the sample.

**Table 23: Individual characteristics description**

	Mean	Std. dev.	Min.	Max.	Obs.
<b>Male</b>	0.48	0.50	0	1	2,799

	Mean	Std. dev.	Min.	Max.	Obs.
<b>Age</b>	29	4	25	41	2,842
<b>White</b>	0.88	0.33	0	1	2,842
<b>International migrant</b>	0.04	0.19	0	1	2,747
<b>Married</b>	0.26	0.44	0	1	2,834
<b>Has children</b>	0.34	0.47	0	1	2,842
<b>Number of children</b>	0.6	1.0	0	7	2,842
<b>Has a degree</b>	0.42	0.49	0	1	2,783
<b>House owner</b>	0.61	0.49	0	1	2,791
<b>Parent: routine and manual occ.</b>	0.32	0.47	0	1	2,552
<b>Parent: intermediate occ.</b>	0.23	0.42	0	1	2,552
<b>Parent: higher managerial, admin and professional occ.</b>	0.45	0.50	0	1	2,552

Source: BHPS and Understanding Society, 2000 to 2019

Notes: Real labour income is adjusted using the Consumer Price Index (CPI) and excludes those who did not work in the month prior to the survey.

We analyse next the relation between migration and employment outcomes, after taking into account the characteristics of individuals in the sample. Table 24 shows the difference in probability of the three outcomes of interest between movers and stayers by a series of characteristics. Those characteristics are gender, race, education and socio-economic background. The model specification used is the equivalent of model 3 described above.

**Table 24: Difference in probability of being employed, of probability being employed in a higher managerial occupation and of real labour market income between movers and stayers by gender, ethnicity, education and socio-economic background**

	Employment	Income	Higher managerial occ.
<b>Male versus female</b>	0.034	415.3***	0.060

	Employment	Income	Higher managerial occ.
	(0.027)	(124.4)	(0.044)
<b>White versus non-white</b>	0.075 (0.065)	-388.6 (273.6)	0.100 (0.083)
<b>Degree holder versus no degree</b>	0.020 (0.030)	27.9 (130.5)	-0.021 (0.042)
<b>Parent: intermediate occ. vs routine/manual occ.</b>	-0.016 (0.037)	-78.9 (150.4)	-0.081 (0.063)
<b>Parent: higher managerial occ. vs routine/manual occ.</b>	0.039 (0.031)	64.0 (153.0)	-0.027 (0.052)
<b>Year and region fixed effects</b>	YES	YES	YES
<b>Macroeconomic variables</b>	YES	YES	YES
<b>Demographic characteristics</b>	YES	YES	YES
<b>Observations</b>	2,269	1,938	1,881

Source: BHPS and Understanding Society, 2000 to 2019

Notes: Standard errors clustered at the local authority level; marginal effects reported.

**Table 25: What is the second most important reason for wanting a job?**

	Stayer	Mover	Difference
<b>Working is normal</b>	5.9	4.4	1.5
<b>Essential foods etc.</b>	12.0	10.4	1.6
<b>Money for extras</b>	20.5	21.7	-1.3
<b>Earn money for self</b>	20.7	20.0	0.7

	Stayer	Mover	Difference
<b>People's company</b>	4.6	10.4	-5.8***
<b>Enjoy working</b>	14.3	17.8	-3.5
<b>Follow my career</b>	21.2	13.9	7.3**

Source: BHPS and Understanding Society, 2000 to 2019

Notes: Categories with smaller size than 2% are excluded; the total number of observations is 623; statistical differences reported; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 26: What is the second most important aspect of a job?**

	Stayer	Mover	Difference
<b>Promotion prospects</b>	9.2	7.8	1.4
<b>Total pay</b>	22.7	26.0	-3.3
<b>Good relationship with manager</b>	15.8	15.2	0.7
<b>Job security</b>	16.6	16.0	0.6
<b>Using initiative</b>	10.0	8.7	1.3
<b>Actual work</b>	16.8	15.6	1.3
<b>Hours worked</b>	7.1	8.2	-1.1

Source: BHPS and Understanding Society, 2000 to 2019

Notes: Categories with smaller size than 2% are excluded; the total number of observations is 623; statistical differences reported; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 27: Differences in labour market outcomes between movers and stayers by individual characteristics**

	Employment	Income	Higher managerial socio economic status
<b>Female</b>	0.042* (0.024)	67.421 (90.456)	0.064* (0.034)
<b>Male</b>	0.077*** (0.019)	482.658*** (110.372)	0.125*** (0.037)
<b>White non-British/non-white</b>	-0.013 (0.065)	625.548** (267.205)	0.002 (0.083)
<b>White British</b>	0.062*** (0.017)	236.920*** (80.426)	0.101*** (0.028)
<b>No degree</b>	0.050** (0.024)	254.197*** (90.613)	0.105*** (0.037)
<b>Degree</b>	0.070*** (0.021)	282.068** (115.135)	0.084** (0.033)
<b>Parent: routine/manual occ.</b>	0.045* (0.026)	254.760** (125.553)	0.129*** (0.049)
<b>Parent: intermediate occ.</b>	0.029 (0.031)	175.822 (117.318)	0.048 (0.048)

<b>Parent: higher managerial occ.</b>	0.084*** (0.022)	318.800*** (108.183)	0.102*** (0.036)
<b>Observations</b>	2,269	1,938	1,881
<b>Year and region fixed effects</b>	YES	YES	YES
<b>Macroeconomic variables</b>	YES	YES	YES
<b>Demographic characteristics</b>	YES	YES	YES

Source: BHPS and Understanding Society, 2000 to 2019

Notes: Standard errors clustered at the local authority level; marginal effects reported for the non-linear regressions.

**Table 28: Differences in probability of being employed in a higher managerial occupation between movers and stayers by gender, ethnicity, education and socio-economic background (including motivation variables)**

	<b>Higher managerial occ.</b>
<b>Male versus female (s.e.)</b>	0.112 (0.087)
<b>White versus non-white (s.e.)</b>	0.224 (0.178)
<b>Degree holder versus no degree (s.e.)</b>	-0.120 (0.083)
<b>Parent: intermediate occ. vs routine/manual occ. (s.e.)</b>	-0.031 (0.114)
<b>Parent: higher managerial occ. vs routine/manual occ. (s.e.)</b>	-0.156* (0.094)
<b>Year and region fixed effects</b>	YES
<b>Macroeconomic variables</b>	YES

	Higher managerial occ.
Demographic characteristics	YES
Motivation variables	YES
Observations	442

Source: BHPS and Understanding Society, 2000 to 2019

Notes: Standard errors clustered at the local authority level; marginal effects reported.

## Differences in employment outcomes between movers and stayers in the most deprived areas

In this section we explore differences in the individual characteristics and employment outcomes of those who leave deprived areas and those who stay within them. We then investigate differences in the employment outcomes of both groups, controlling for their individual characteristics as well as local economic indicators. Finally, we focus on specific population subgroups, based on gender, ethnicity, education and socio-economic background, and discuss differences in employment outcomes between those who leave and those who stay in deprived areas for individuals in each subgroup.

### Data

The ONS Longitudinal Study (LS) is a 1% sample of the decennial census of England and Wales. ONS LS participants are selected based on being born on one of four (undisclosed) birth dates and are traced to the NHS register, enabling the linkage of events data, such as mortality and cancer registrations, as well as data from five consecutive censuses (1971, 1981, 1991, 2001 and 2011). Linkage stops when the participant dies or emigrates from England or Wales, and new members join the LS when they are born on one of the four birth dates or after they move to England or Wales from another country. The LS therefore provides representative cross-sectional and longitudinal information about the population of England and Wales for the years 1971 to 2011.

The ONS LS makes it possible to investigate differences in the employment outcomes of movers and stayers, using a much larger sample size. It also allows us to include in our analysis individuals from 1971 onwards. We focus on individuals aged between 30 and 36 in the most recent census in which they were enumerated. We use earlier census waves to obtain information on the government office region in which they grew up (where they lived between the ages of 10 and 16), as well as information on their parents' socio-economic status. We first observe individuals as children during the 1971, 1981 and 1991 waves, and then as adults in 1991, 2001 and 2011, respectively. It should also be noted that the ONS LS includes data for England and Wales only.

Our aim is to understand the intergenerational gains of internal migration for the employment outcomes of people who migrate out of the most deprived areas. For this reason we consider a person to be a mover if they are living as an adult (aged 30 to 36) in a different government



office region to the one where they lived as a child (aged 10 to 16). The larger sample size of the ONS LS in comparison with the BHPS-UKHLS allows us to make comparisons between movers from, and stayers in, the most deprived areas. We define the most deprived government office regions as those with the lowest proportion of high-skilled jobs in each wave. High-skilled jobs are on average better paid than low-skilled jobs, and thus areas with the smallest proportion of high-skilled jobs would on average contain individuals who are not as affluent as those in other areas. We split this into population-weighted quintiles, and the analysis focuses on regions in the first quintile, as they are the most deprived.<sup>23</sup>

The employment outcomes considered in the analysis are:

- whether the individual is employed
- whether they are employed in a professional or technical occupation<sup>24</sup>

Unfortunately, the ONS LS does not contain information on earnings from work.

The analysis includes the controls and employment outcomes listed in Table 29. These are observed in adulthood, at the point when the outcome measures are observed.

**Table 29: Variables from the ONS LS**

Variable category	Variable description	Range of values
Outcome	Being employed	1 if they are employed, 0 if they are not employed
Outcome	Employment in higher managerial and professional occupation	1 if they are employed in a professional and technical occupation, 0 if they are employed in a skilled occupation or in a semi-skilled/unskilled occupation (Table 0.3)
Migrant <sub>i</sub>	Internal migrant	1 if they live in a different government office region to the one they grew up in, 0 if they live in the same government office region they grew up in
Demo <sub>i</sub>	Gender (male)	1 for male, 0 for female

<sup>23</sup> The information we use to create the quintiles is where individuals lived as a child.

<sup>24</sup> Occupations are divided into three classes: professional and technical; skilled; and semi-skilled/unskilled.

Variable category	Variable description	Range of values
Demo <sub>i</sub>	Age	The age of the individual as an adult
Demo <sub>i</sub>	Ethnicity	1 if they are white, 0 if they are non-white
Demo <sub>i</sub>	Disability	1 if they have a long-term limiting health condition, 0 otherwise
Demo <sub>i</sub>	Marital status	1 if they are married or registered in a same sex civil partnership, 0 otherwise
Demo <sub>i</sub>	Education (degree)	1 if they have a degree, 0 otherwise
Demo <sub>i</sub>	House tenure	1 if the individual owns their house either outright, via mortgage or via shared ownership, 0 otherwise
Demo <sub>i</sub>	Being born out of the UK	1 if they were born out of the UK, 0 if they were born in the UK
Demo <sub>i</sub>	Social class of the parent	Three-class SOC2010 social class (Table 0.3): (1) employed in a professional and technical occupation; (2) employed in a skilled occupation; (3) employed in a semi-skilled/unskilled occupation
Macro <sub>k</sub>	Proportion of professionals	Proportion of professional and technical occupations in the government office region (using specification at Table 0.3)
Macro <sub>k</sub>	Unemployment rate	Unemployment rate in the government office region
$\gamma$	Government office region fixed effects	Government office region
t	Year effects	Year effects

In addition to these controls observed in adulthood, the analysis controls for the socio-economic status of the parent and the area where the individual grew up, based on the earlier observation of the individual as a child or teenager. In some cases, the social class of either the mother or the father is available and in others, the social classes of both parents are available. When both are available, we use the higher of the two to indicate socio-economic background.

## Methods

### Basic specification

The basic specification is as follows:

$$y_i = a + b * \text{Migrant}_i + c * \text{Demo}_i + d * \text{Macro}_k + \gamma + t + \varepsilon_i$$

where  $y_i$  is the employment outcome of person  $i$ ,  $\text{Migrant}_i$  indicates whether the person is a mover or not,  $\text{Demo}_i$  is the demographic and individual characteristics of the person,  $\text{Macro}_k$  is the macroeconomic controls of area  $k$  where the person lives as an adult,  $\gamma$  is the regional fixed effects, and  $t$  is the year effects.

Both outcomes are binary and the models are estimated using probit regressions, with marginal effects reported.

In our regression analysis we specify three models:

- Model 1: controlling only for migrant status, regional fixed effects and year effects
- Model 2: controlling for migrant status, regional fixed effects, year effects and  $\text{Macro}_k$
- Model 3: controlling for migrant status, regional fixed effects, year effects,  $\text{Macro}_k$  and  $\text{Demo}_i$

### Multivariate analysis: differences between movers and stayers by individual characteristics

The final specification is used to investigate differences in employment outcomes between stayers and movers by different individual characteristics.

The approach is similar to the one used with the BHPS-UKHLS data and set out in the section above. The specification is:

$$y_i = a + b_1 * \text{Migrant}_i + b_2 \text{Characteristic}_i + b_3 \text{Migrant}_i * \text{Characteristic}_i + c * \text{Demo}'_i + d * \text{Macro}_k + \gamma + t + \varepsilon_i$$

where  $\text{Characteristic}_i$  is either gender, ethnicity, education level or socio-economic background and  $\text{Demo}'_i$  is the group of individual characteristics minus the one we are including in the interaction. We use the third model specification for this part of the analysis. After we estimate the differences in outcomes by migrant status for each of the characteristics, we check if any apparent differences between movers and stayers are statistically significant.

## Differences in employment outcomes between movers and stayers in the most deprived areas: additional results

Table 30 describes the characteristics of stayers and movers from the most deprived regions.<sup>25</sup> There are substantial differences between movers and stayers when it comes to educational level and social class background.

Over two-fifths (44%) of movers hold a degree, compared with only 16% of stayers. In terms of social class background, nearly half (46%) of movers and a quarter (25%) of stayers had at least one parent in a professional and technical occupation. A smaller percentage of movers had a long-term limiting disability (8%) compared with stayers (5%). This is to be expected, given the barriers a disability can impose.

**Table 30: Descriptive statistics, stayers in and movers from the most deprived quintile**

	Stayers	Movers
<b>Disabled</b>	0.08	0.05
<b>Degree holder</b>	0.16	0.44
<b>Parent: professional and technical occupations</b>	0.25	0.46
<b>Parent: skilled occupations</b>	0.53	0.41
<b>Parent: semi-skilled/unskilled occupations</b>	0.21	0.13
<b>Professional and technical occupations</b>	0.31	0.58
<b>Skilled occupations</b>	0.46	0.30
<b>Semi-skilled/unskilled occupations</b>	0.23	0.11
<b>Employed</b>	0.80	0.84

Source: ONS LS, 1971 to 2011

Notes: Number of observations is 24,969 for stayers and 6,859 for movers; the values for all variables indicate proportions.

Table 30 also shows there are differences in the employment outcomes experienced by those who leave and those who stay in deprived areas. Movers are more likely to be employed than stayers (84% of movers of working age were employed compared with 80% of stayers). The most striking difference is in socio-economic class, where nearly three-fifths (58%) of movers

<sup>25</sup> These are defined as individuals who grew up in the lowest quintiles, based on the percentage of employees in high-skilled occupations of government office regions.

were in a professional or technical occupation, compared with less than one-third (31%) of stayers. Nearly half (46%) of stayers were in skilled occupations (46%), with around one-quarter (23%) in semi-skilled or unskilled occupations. Only 11% of movers were employed in a semi-skilled or unskilled occupation.

Table 31 shows the relative probability of employment between those leaving and those staying in the most deprived areas, depending on individual characteristics. These results come from separate regressions for each interaction.

**Table 31: Differences in probability of employment between movers from and stayers in the most deprived quintile**

	coefficient	(s.e.)
<b>Female</b>	-0.053***	(0.018)
<b>Male</b>	0.006	(0.010)
<b>Non-white</b>	0.011	(0.031)
<b>White</b>	-0.026**	(0.013)
<b>No degree</b>	-0.019	(0.014)
<b>Has degree</b>	-0.032**	(0.013)
<b>Parent: professional and technical occ.</b>	-0.039***	(0.015)
<b>Parent: skilled occ.</b>	-0.024*	(0.014)
<b>Parent: semi-skilled/unskilled occ.</b>	0.010	(0.018)
<b>Year and region fixed effects</b>	YES	
<b>Macroeconomic variables</b>	YES	
<b>Demographic characteristics</b>	YES	
<b>Observations</b>	31,610	

Source: ONS LS, 1971 to 2011

Notes: Separate regressions for each interaction; reported marginal effects, following probit regressions; standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 32 shows the relative probability of being employed in a professional or technical occupation between those leaving and staying in the most deprived areas, depending on individual characteristics. Those results come from separate regressions for each interaction.

**Table 32: Differences in the probability of being employed in a professional or technical occupation between movers from and stayers in the most deprived quintile**

	<b>Coefficient</b>	<b>(s.e.)</b>
<b>Female</b>	0.078***	(0.017)
<b>Male</b>	0.143***	(0.018)
<b>Non-white</b>	0.061*	(0.034)
<b>White</b>	0.110***	(0.017)
<b>No degree</b>	0.131***	(0.018)
<b>Has degree</b>	0.076***	(0.017)
<b>Parent: professional and technical occupation</b>	0.091***	(0.020)
<b>Parent: skilled occupation</b>	0.125***	(0.018)
<b>Parent: semi-skilled/unskilled occupation</b>	0.122***	(0.023)
<b>Year and region fixed effects</b>	YES	
<b>Macroeconomic variables</b>	YES	
<b>Demographic characteristics</b>	YES	
<b>Observations</b>	29,669	

Source: ONS LS, 1971 to 2011

Notes: Separate regressions for each interaction; reported marginal effects, following probit regressions; standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

# Annex

**Table 0.1: National Statistics Socio-economic Classification, eight-, five- and three- class breakdown**

Eight classes	Five classes	Three classes
1. Higher managerial, administrative and professional occupations	1. Higher managerial, administrative and professional occupations	1. Higher managerial, administrative and professional occupations
1.1 Large employers and higher managerial and administrative occupations		
1.2 Higher professional occupations		
2. Lower managerial, administrative and professional occupations		
3. Intermediate occupations	2. Intermediate occupations	2. Intermediate occupations
4. Small employers and own account workers	3. Small employers and own account workers	
5. Lower supervisory and technical occupations	4. Lower supervisory and technical occupations	3. Routine and manual occupations
6. Semi-routine occupations	5. Semi-routine and routine occupations	
7. Routine occupations		
8. Never worked and long-term unemployed	Never worked and long-term unemployed	Never worked and long-term unemployed

**Table 0.2: Standard Occupational Classification, SOC2010**

Major groups
1 Managers, directors and senior officials
2 Professional occupations
3 Associate professional and technical occupations
4 Administrative and secretarial occupations
5 Skilled trades occupations
6 Caring, leisure and other service occupations
7 Sales and customer service occupations
8 Process, plant and machine operatives
9 Elementary occupations

**Table 0.3: Social class based on occupations coded to SOC2010**

Six groups	Three groups
Professional etc. occupations	Professional and technical occupations
Managerial and technical occupations	
Skilled occupations – non-manual	Skilled occupations
Skilled occupations – manual	
Partly skilled occupations	Semi-skilled/unskilled occupations
Unskilled occupations	