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-Chapter 6

Temporal Change in Internal Migration in the United Kingdom

Nik Lomax and John Stillwell

As seen in Chapter 4 (Figure 4.1), the United Kingdom (UK) occupies an intermediate rank in terms of overall migration intensity, coming below the USA, Australia and Sweden but above Germany, Japan and Italy. The integrated results of the population censuses carried out in 2011 across its four countries indicate that 6.8 million individuals, or almost 11 in every 100 persons, were living at a different usual address from that of 12 months earlier. The censuses captured individual migrants who were alive at the start of that year as well as at the end, regardless of the distance over which they travelled. Whilst 40 per cent of these transition flows occurred between local authority areas (the administrative units for which resource allocation decisions are made), the majority were of shorter distance and took place within local authority areas. The census provides the only reliable source of information about *total* migration in the UK, but its infrequency and problems of definitional consistency necessitate the adoption of data from other sources to answer the question at the heart of this chapter: how has the intensity of internal migration in the UK changed over time?

Our starting point for answering this question must therefore be to acknowledge that there is no source of readily available data that allows us to monitor *total* migration propensities in the UK consistently over long periods of time: many of the problems of constructing time-series migration data sets that have been fully documented in Chapter 3 are exemplified in the UK. However, there have been a number of studies of temporal change in internal migration propensities on which we can draw in this quest to establish whether intensities in the UK have followed a trajectory of decline similar to that which has occurred in migration between counties in the USA since the 1970s (Cooke, 2013; Kaplan and Schulhofer-Wohl, 2012). In particular, we make substantial reference to two recent studies by Champion and Shuttleworth (2016a, 2016b), which use, respectively, administrative data from the National Health Service Central Register (NHSCR) and microdata from the Office of National Statistics (ONS) Longitudinal Studies of linked census records, to map out the trajectory of internal migration within England and Wales since the 1970s.

Previous research in the UK (e.g. Champion *et al.*, 1998) recognises that migration propensities are determined by both personal and place characteristics. Whilst the availability of data by age group reveals differences in both migration propensities and geographical patterns across the life course, spatial attributes at different scales may also play key roles in determining migration behaviour, as may the level of development and the condition of the national economy. Moreover, there are clear geographical-scale effects on the measurement of migration indicators which obscure the comparison between countries, as demonstrated by Bell *et al.* (2015a). Here we make use of an estimated annual time series of migration between local authority districts (LADs) in the UK that have been generated by Lomax *et al.* (2014). The time series runs from 2001/02 until 2012/13, covers the whole of the UK at a finer spatial scale (404 LADs) than that used by Champion and Shuttleworth (2016a) and involves a more detailed set of age groups to decompose the aggregate counts. Importantly, this set of time-series data allows us to monitor changes in intensities and patterns of migration over a period in which the UK experienced rapid population growth in parallel with the worst recession in post-war times.

The remainder of this chapter develops these points more fully in three sections. The first describes the main types of data sets that are available for studying the UK's internal migration patterns and trends and outlines their strengths and weaknesses for present purposes. The second summarises the temporal changes observed by Champion and Shuttleworth (2016a, 2016b) and goes on to provide additional insights into migration across the North-South divide for the whole UK using an effectiveness indicator that measures the impact of migration on population settlement. Finally, using Lomax *et al.* (2014)'s time series, we seek to identify what changes, if any, have occurred in migration within and between urban and rural areas for different age ranges. Particular attention is paid to London since it is the hub of the UK's national migration network, with almost one in every five migrants in 2010/11 moving to, from or within the capital.

Key Data Sources and Spatial Systems

The construction of consistent time-series data on migration within the UK is a difficult and time-consuming task. This is partly because the collection of internal migration data is undertaken by three separate agencies covering England and Wales, Scotland and Northern Ireland, as outlined in more detail below. Even more problematic are changes over time in the instruments for data capture and also in the boundaries of the geographical units that are used

for recording changes of residence between areas. This explains why there are a plethora of cross-sectional studies of migration in the UK (as elsewhere) but relatively few that examine trends and processes that extend beyond a time period of one decade at most.

Our understanding of internal migration and its temporal change is captured from a number of different sources that are either census, administrative or survey based. Censuses in the UK since 1961 have contained a one-year migration question that continues to provide the most reliable and comprehensive data, some of which has been released in aggregate statistics or origin-destination tables and some as microdata in either cross-sectional (i.e. Samples of Anonymised Records) or longitudinal (i.e. Longitudinal Studies) form. In this chapter, we summarise novel analysis reported by Champion and Shuttleworth (2016b) that uses data from the ONS-LS derived not for one-year but for 10-year periods for England and Wales from record linkage between censuses since 1971 and which also contains flows disaggregated by distance of move (<10 km, 10-50 km, 50-200 km; 200+ km) and by a range of personal characteristics.

Whilst UK census data are extremely valuable for their reliability, comprehensive coverage throughout the national territory (including all distances of address changing, unlike many other countries) and the relatively rich detail that they provide for small areas, they are somewhat limited by a number of factors including: the infrequency of their collection (once every ten years apart from a sample census in 1966); changes in the definition of migration flows (for example, including or excluding flows between students' parental domiciles and term-time places of residence); changes in the statistical disclosure control mechanisms that are required to ensure confidentiality; and changes in the boundaries of the geographical areas used for reporting migration statistics. It is these constraints that have prompted researchers to look for alternative sources of data on migration, one of the most popular of these being the National Health Service Central Register (NHSCR), which collates the changes of address of NHS patients recorded by their doctors. The NHSCR provides movement data on a mid-year to mid-year basis dating back to 1971 for inter-regional moves and to 1975 for intra-regional (between health service areas) moves. The NHSCR captures each migration event, with the result that studies comparing NHSCR data with census transition data, the latter counting migrants rather than moves, indicate higher levels of mobility for the former, although data from both sources illustrate very similar spatial

patterns for equivalent geographical areas (Ogilvy, 1980; Devis and Mills, 1986; Boden *et al.*, 1992; Stillwell *et al.*, 1995).

Amongst the disadvantages of the NHSCR data are the lack of data on shorter-distance flows within health areas and the changes that have taken place to the NHSCR geography over the 36 year time series constructed by Champion and Shuttleworth. Their approach has been to identify the lowest common denominator (LCD) areas, resulting in a set of 80 consistent polygons for the period from 1976 to 2011, which aggregate into 10 former Government Office Regions (GOR) in England and Wales and form the geographical basis for the analysis reviewed in the next section.

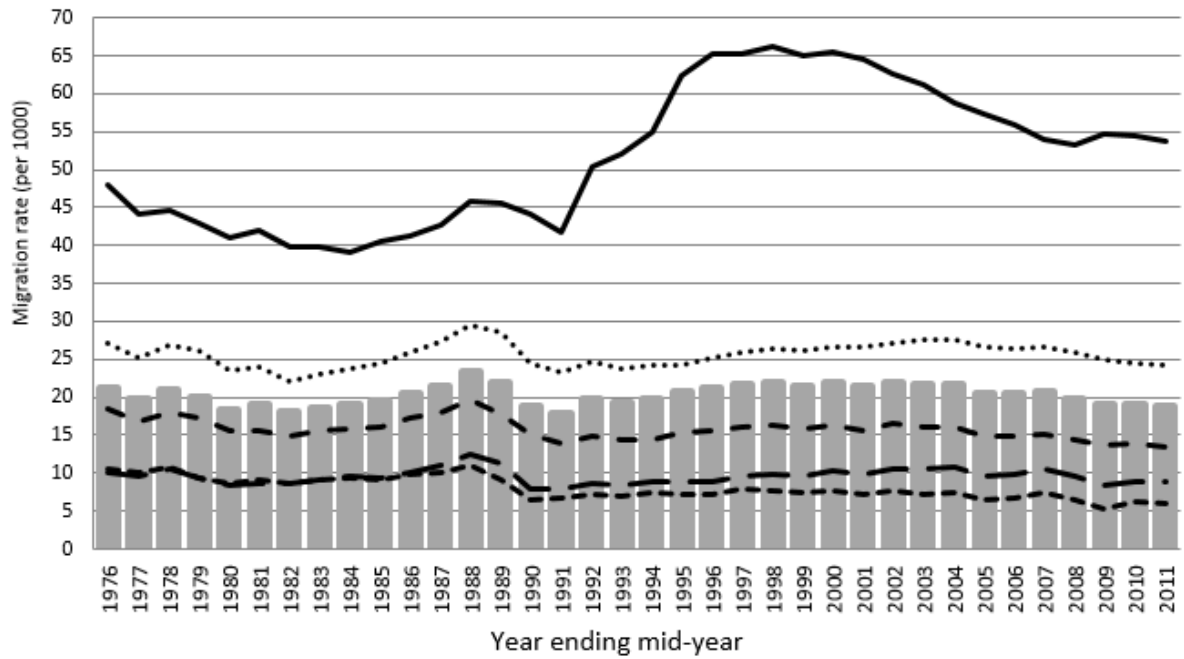
Another source of migration data, introduced in more recent times, is the Patient Register Data Service (PRDS), an annual download of home addresses of NHS patients which is compared with the download from the previous year to indicate where changes have occurred. These data are therefore transition data insofar as they capture migrants alive at both start and end points of each period and ONS provide annual estimates of flows between local authorities in England and Wales. Lomax *et al.* (2013) report how these data, together with administrative data on flows from National Records for Scotland (NRS) and the Northern Ireland Statistical Research Agency (NISRA), have been used to create a time series of flows disaggregated by age and sex between LADs across the whole of the UK, including flows between LADs in each of the four different UK nations. The estimated time series is used as the basis for some spatial analysis of time series change between 2001/02 and 2012/13 later in the chapter.

The third source of internal migration data are surveys such as the Labour Force Survey (LFS) and the General Household Survey (GHS) which have been running from 1973 and 1971 respectively. As outlined in Stillwell *et al.* (2010), these are often of great value when used for analysis at a national or regional level but sample size normally precludes their use for sub-regional analysis and in the case of the GHS, the origin of the migration flows is either the current region or elsewhere, preventing the distinction between an internal and an international move. We do not make use of any government survey data in what follows, although some results from a large consumer survey undertaken by Acxiom Ltd in the mid-2000s (Thomas *et al.*, 2014) are reported in the next section.

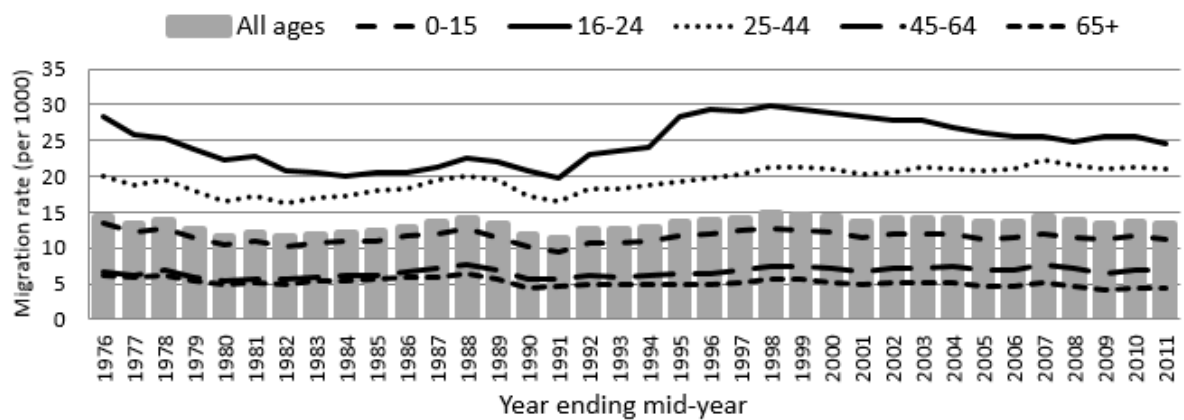
Long-term Fluctuations in Annual Migration Intensity

Amongst the earliest studies of internal migration in the UK, the most influential was Ravenstein (1885) which, using birthplace and enumeration data from the 1871 and 1881 Censuses, set out a series of generalisations about migration that have since become reference points for later researchers. Many studies have been conducted subsequently, but virtually all have used either census or NHSCR data, particularly in the last 50 years since a one-year census question was first asked in 1961, and have involved the analysis of migration over relatively short time spans. Examples include Ogilvy (1982), Devis (1984), Stillwell and Boden (1986), Champion (1989a), Rosenbaum and Bailey (1991), Stillwell (1994), Stillwell *et al.* (1995, 2015, 2016), ODPM (2002), Duke-Williams and Stillwell (2010), Fielding (2012), Lomax *et al.* (2013, 2014), although Stillwell *et al.* (1992) traced the fluctuation in migration intensities from 1960/61 to 1988/89 using a combination of census and NHSCR data.

Most recently, Champion and Shuttleworth (2016a) have constructed a longer time series that captures trends in intensities of migration between the former GOR and between health areas within each GOR in England and Wales from 1975/76 to 2010/11 using data supplied by ONS entirely from the NHSCR. These two types of flow allow a distinction to be drawn between longer-distance, inter-regional migration and shorter-distance, ‘intra-region, inter-health-area’ migration, but exclude the flows taking place within health areas. The time-series schedules of inter- and intra-regional migration intensities computed for each year based on start-of-period populations are shown in Figure 6.1 and demonstrate both the fluctuation year on year in the aggregate (all age) migration intensity and the variation in age-group intensities around the all age trend. In both cases, there is little evidence of a decline in the rates of migration since the 1970s equivalent to that observed for inter-county migration between and within states in the USA (see Chapter 5 of this book).



a. Inter-regional rates (between regions made up of consistent areas)



b. Intra-regional rates (between consistent areas within regions)

Figure 6.1. Rates of inter- and intra-regional migration per 1000 population for consistent areas in England and Wales, 1975/76-2010/11 (Source: adapted from Champion and Shuttleworth, 2016a, Figures 1, 3, 5 and 6)

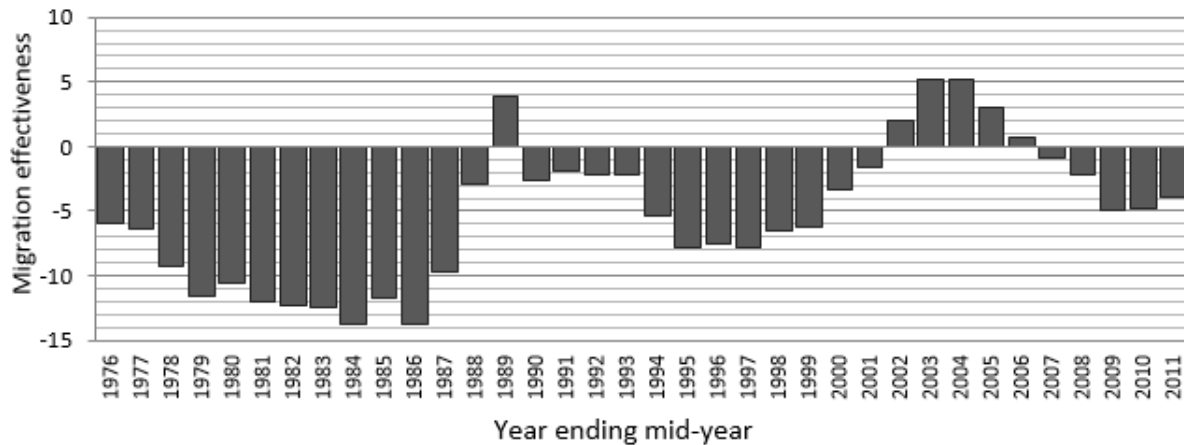
The trend for all age migration observed in both series begins in the mid-1970s with a continuation of a decline that Stillwell *et al.* (1992) suggest had been occurring since 1970/71. This is followed by a rise after 1980/81 as the country pulled out of recession to a peak of nearly 24 per thousand moves in the case of inter-regional migration at the height of the boom in 1987/88, before dropping rapidly to its lowest point across the whole time series in 1990/91, a time when the country was back in recession and experiencing civil unrest as a

result of unemployment and social discontent. Following the end of this recession, the British economy enjoyed a record run of unbroken economic growth lasting more than 15 years, until falling back into an economic downturn that was ultimately much worse than that of the early 1990s. Migration rates gradually increased throughout most of this period. Whilst it is possible to attribute the declining rates since 2007/08 to the onset of the Great Recession, the drop appears to have begun well beforehand. For inter-regional migration, the decline in rates began in the first half of the 2000s, perhaps due to the arrival of large numbers of migrants from the eight eastern European countries that joined the European Union in 2004 which, as Champion and Shuttleworth (2016a) suggest, may have reduced the need for longer-distance, inter-regional movements by the existing population. For migration between areas within regions, the turning point appears to have been earlier still, with the rate falling marginally after 1997/98 but not consistently from year to year.

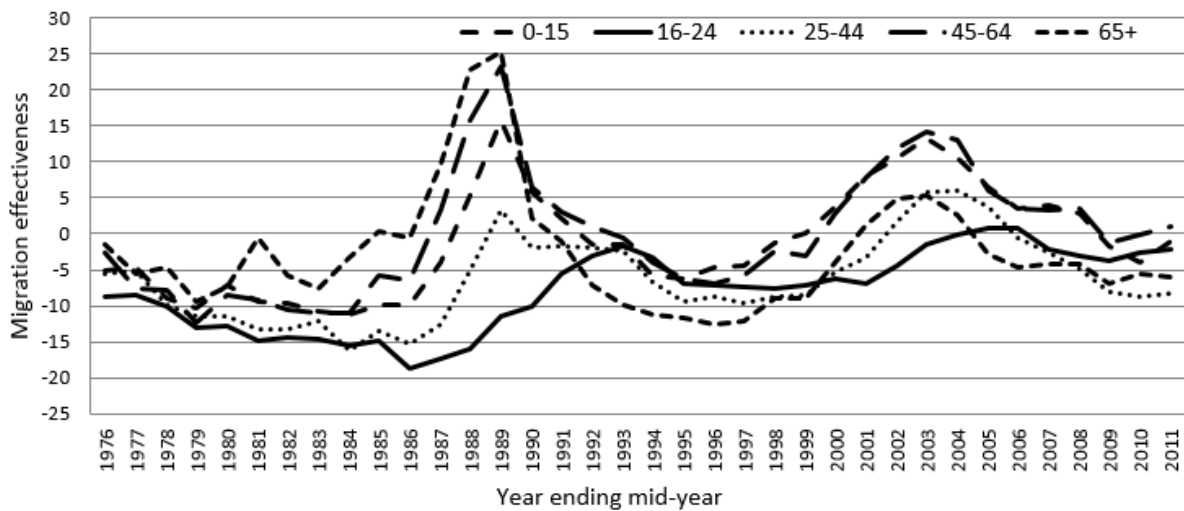
These aggregate rates of migration are essentially determined by the migration propensities of individuals in different demographic and socioeconomic subgroups of the population. Figure 6.1 also contains the migration intensity schedules over the same period for five age groups that reflect those in broad stages of the life course: children aged 0-15; students and young adults aged 16-24; labour force migrants aged 25-44; older workers and (pre-) retirement migrants aged 45-64; and post-retirement migrants aged 65 and over. There are clear variations in migration propensities between age groups which conform to familiar patterns observed in the UK by Champion (2005) and Dennett and Stillwell (2010), but the most significant feature of the time-series trends in age-specific migration is the dramatic increase in the intensity of migration exhibited by those aged 16-24. Rates of inter-regional migration in this age group increase from 40 per thousand in 1990/91 to 65 per thousand in 1995/96 before stabilising and then dropping back to around 53 per thousand by the end of the period, whereas intra-region movement followed a similar pattern but with rates of half that magnitude. The primary reason for this increase is likely to be the policy changes in the UK university sector (Wyness, 2010) that have resulted in the expansion of numbers participating in higher education, particularly during the 1990s following the introduction of the student loan system in 1990 and the Further Education and Higher Education Act in 1992 that granted university status to 48 polytechnics, making them more attractive to students beyond their own localities. Changes over time are less evident for the other age groups, with greatest stability in rates apparent for those aged 45-64 and 65 plus and decline over the last decade

being observed for inter-regional moves but not for moves between the health areas within regions.

Drawing on the same time-series data used by Champion and Shuttleworth (2016a) to establish the temporal trends in migration intensity, we have examined the spatial pattern of migration within the UK across the ‘North-South’ divide, a framework frequently used by politicians and social commentators concerned with highlighting spatial inequalities in social and health indicators. In this case, the West Midlands region is included in the ‘North’ together with the North West, Yorkshire and The Humber, the North East, Wales, Scotland and Northern Ireland. The time-series graphs presented in Figure 6.2 for persons of all ages and for those in the five-age groups used earlier show a migration effectiveness ratio (MER) indicator in which net migration for the North is computed as a percentage of the gross migration flows between the North and the South – a useful measure for monitoring migration impact (Bell *et al.*, 2002; Rees *et al.*, 2016). The time series for aggregate migration is one of cyclical fluctuation, with the North having a positive net migration balance in only six years of the time series. During the late 1970s and first half of the 1980s, the MER indicator shows increasing losses from the North to the South through net migration which reached over 50,000 at its peak in 1986, before falling sharply in the recession years of the late 1980s and becoming positive in 1989 before retreating back to modest losses of less than 5,000 in the early 1990s. Net losses from the North increased to over 15,000 per year in the mid-1990s as the country pulled out of recession and, after 1997, when economic growth reached 2-3 per cent per year, negative net migration dwindled and gains from the South were experienced in the early 2000s. By the onset of the Global Financial Crisis in 2007, the North was once again losing migrants to the South at an increasing rate, a trend which continued until the last year of the time series when a small upturn was evident. In terms of the long-term trend in migration between the North and the South, ‘the net drift to the latter is now but a pale shadow of its former self’ (Champion, 2016, p. 129).



a. All ages



b. Broad age groups

Figure 6.2. Migration effectiveness ratio for the North of the UK by broad age group, 1975/76-2010/11 (Source: authors' calculations based on NHSCR data supplied by Tony Champion)

Although the time series appears to be cyclical, there is no clear cut relationship between the North-South net migration divide and the trend in the rate of economic growth. Moreover, it is revealing to observe that the age groups with the most prominent fluctuations in MER as far as the North-South balance is concerned are the two oldest and the youngest age groups. This was particularly the case in the first period of net gain by the North in the late 1980s, whereas the effectiveness of net gains in the 2000s was much less apparent for those aged 65 and over. The MER time-series schedule for the 16-24 year olds, whose migration intensity is the highest of all the age groups, illustrates the relative attractiveness of the South across all years except 2004/05 and 2005/06.

The trends in net migration effectiveness ratio observed for the North in Figure 6.2 are a reflection of the changes in the difference between the flows in both directions, as shown for all-age migration in Figure 6.3. Migration in each direction during the time series fluctuates around 200,000 moves per year. Initially, in the first ten years of the series, moves from the North to the South were considerably higher than in the opposite direction, but in the late 1980s it was the migration from the South to the North that increased the more rapidly, creating the first incidence of net gain in the North in 1989. The 1990s, however, saw an increase in moves from the North which created the migration deficit throughout the decade, until migration from the South increased again in the first half of the 2000s causing the North's net balance to become positive. During and since the last recession, moves from North to the South have remained above 200,000, whereas those in the opposite direction have fallen below this threshold, bringing the North's balance back into deficit. These North/South fluctuations in MER reflect the relative rates of job creation in the two regions, higher in the South than the North. But, at the end of each boom, job growth in the South has raised housing prices so much that some commuters to London job centres seek cheaper residences in the southern fringes of the North, leading, briefly, to net internal migration outflow.



Figure 6.3. Migration flows between the North and South, 1975/76-2010/11 (Source: authors' calculations based on NHSCR data supplied by Tony Champion)

Until this point, our review and commentary has been concerned with migration over relatively long distances, but it is well known that the intensity of migration increases as the zones used for measuring migration reduce in size, a relationship measured using Courgeau's

k (Courgeau, 1973; Bell *et al.*, 2015b). In the UK, the crude intensity for inter-regional migration recorded by the 2011 Census was 18 per thousand in 2010/11, whilst the crude intensity for aggregate migration reached 108 per thousand, as mentioned at the start of the chapter. The effects of scale on migration distance have been observed in recent studies by Stillwell and Thomas (2016) using origin-destination postcode data for England from a large consumer survey undertaken by Acxiom Ltd, whilst changes in migration distance over time have been documented by Champion and Shuttleworth (2016b) using categorised microdata from ONS Longitudinal Studies for England and Wales. The former study highlights the advantage of having access to detailed geographic locations of origin and destination and thereby enabling precise measures of migration distance to be computed. The consumer survey data show that in the mid-2000s, whereas the mean distance of migration in England was around 25km, the median was just under 3km (Stillwell and Thomas, 2016, Table 2, p. 11), revealing the extent of skew in the distribution of migration flows towards short-distance residential mobility. The study by Champion and Shuttleworth (2016b) is particularly valuable because it provides time-series data over four decades by presenting the percentages of people who were living at an address at the end of each intercensal period that was different from that at the previous census date and cross-classifies these migrants according to how far they moved. The graph in Figure 6.4 illustrates how migration propensity declined consistently over the four decades from a rate of 55 per cent in the 1970s to 45 per cent in the 2000s. Moreover, the graph shows that the fall in the aggregate rate is almost entirely explained by the decline in the rate of moves taking place over less than 10km, which dropped from 36.9 per cent in the 1970s to 27.5 per cent in the 2000s, with the percentages of migration in the three longer-distance bands remaining relatively unchanged.

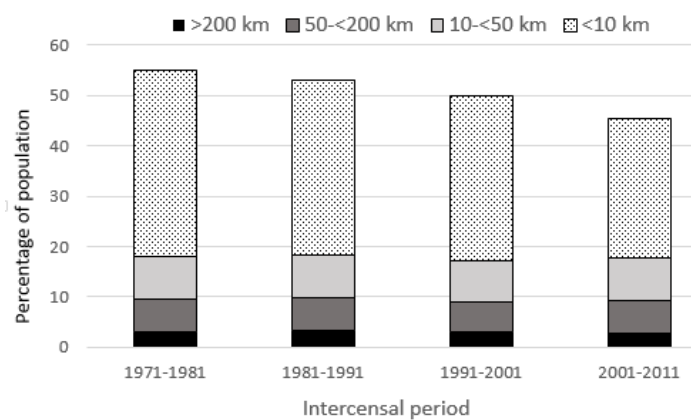


Figure 6.4. Percentage of the England and Wales population surviving from one census to the next but having a different address, by distance band (adapted from Champion and Shuttleworth, 2016b, Figure 1)

Despite the limitations of the use of ten-year data rehearsed by Champion and Shuttleworth (2016b) – including the less than perfect linkage of individuals between censuses, the possible undercounting of short-distance moves in the 1980s and, most importantly, the change in the census definition of the usual residence of students living away from home during term-time between 1991 and 2001 – the conclusion is that there has been a sustained decline in shorter-distance residential mobility over the last four decades. The authors go on to validate these findings and to identify the types of individual that experienced the highest migration intensities and the greatest declines in rates of migration over different distances between the first and last decades of the time series. Those in the older age groups (55 plus), together with those in the retired and widowed categories, for example, stand out as being the individuals whose rates have declined most in the less than 10km distance band and, thus, for all distances.

The analyses of longitudinal census data undertaken by Champion and Shuttleworth are particularly valuable for exposing the longer-term temporal changes in residential mobility at the national level that are so difficult to capture from cross-sectional census or administrative data sets. However, the results reported by Champion and Shuttleworth refer only to England and Wales rather than the UK, use only five rather broad age groups and provide no information about changes in the spatial patterns of migration over time. In the next two sections, we seek firstly to understand how recent intensities have changed within the UK as a whole, making use of estimated annual flows for 11 age groups between 404 LADs and examining changing spatial patterns for all age migration from 2001/02 to 2012/13, a period which has seen rapid population change and fluctuations in the economy on a scale not experienced since the inter-war years. Secondly, we recognise the importance of London's influence in the UK migration network and the key role which the capital plays at the core of south-eastern England, particularly as a social mobility escalator that attracts young adults at rates which are higher than elsewhere in the country but then experiences significant losses of migrants in all other age groups as they step off the escalator and move away from London (Fielding, 1992). We explore changes in MER for Greater London in both the short-term, by using data from the latest two censuses, and in the long term with data from the database compiled by Champion and Shuttleworth (2016a).

Recent Changes in Migration Intensities and Spatial Patterns

Our estimates show that between 2.8 and 3 million individuals, or around 5 per cent of the UK population, migrated between districts in the UK in any one year of the 12-year time series from 2001/02 to 2012/13. Overall, the average intensity declined from 48.4 migrants per thousand people in the first six years of the time series to 46.3 per thousand in the last five years, a relative change of only 4.3 per cent between two periods with very different national economic conditions. Figure 6.5 shows the year-on-year rates of migration for all ages represented as vertical bars, and the time series of 11 age-specific migration rates as individual lines. Up to mid-year 2007, the all-age migration rates remain fairly stable (between 47.7 and 48.9 migrants per thousand), while the rate in 2006/07 represents a peak in the time series (49.4 migrants per thousand). From this high point, total migration rates drop to between 45 and 47 migrants per thousand until 2011/12, with some recovery evident towards the end of the time series (to 46.7 per thousand in 2012/13). When age-specific rates are compared, the 20-24 age group consistently demonstrates the highest, with a peak of 142 migrants per thousand in 2008/09. This is the age group identified as ‘leaving university for work’ by Champion *et al.* (2003), with much of the mobility attributed to individuals who leave a university town or city to take up their first graduate job (or increasingly, it might be argued, return home to their parents’ address while they look for work). Inter-district migration rates for those aged 15-19 are lower because only those aged 18-19 will be making their first move away from home to study in higher education and those leaving school at 16, whose move may be prompted by a first job, are more likely to move over relatively shorter distances.

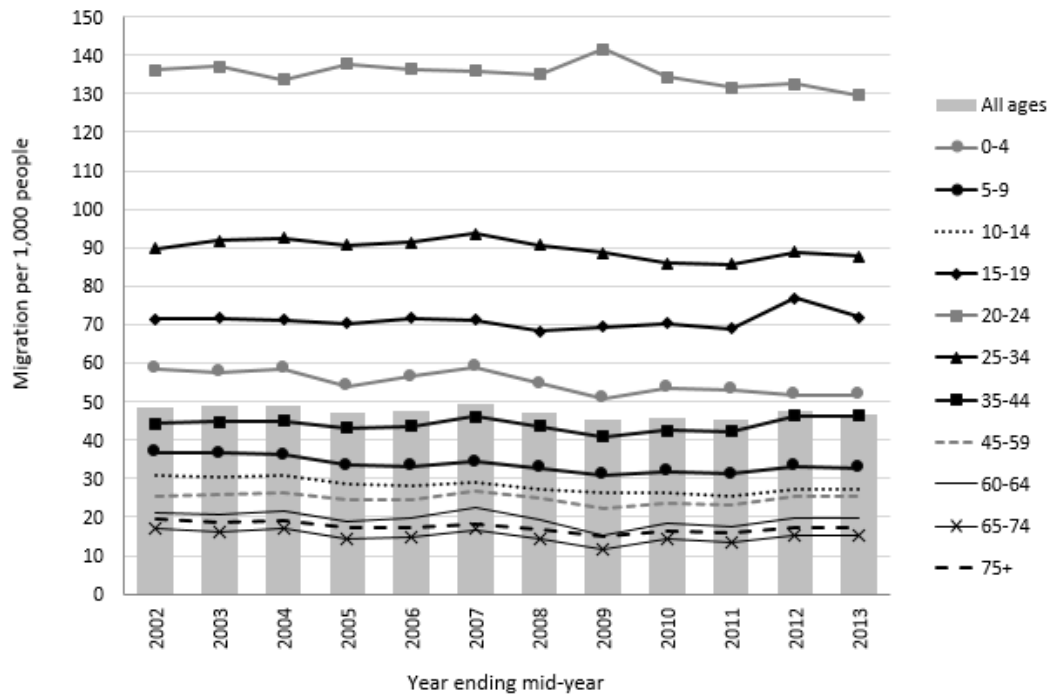


Figure 6.5. Rates of migration between 404 consistent local districts, 2001/02-2012/13, by age group (Source: authors' calculations based on their time series estimates of flows between districts)

The 25-34 group exhibits the second highest inter-district rate, but this is substantially lower (peaking at 94 migrants per thousand in 2006/07) than those in their early 20s. This age group encompasses a variety of life course events, including couple formation and family commencement, both of which drive migration for cohabitation and upsizing to accommodate children. The migration intensities of the four family age groups – children aged 0-4, 5-9 and 10-14, together with their parents aged 35-44 – are closest to the all-age intensity time series. Parents cannot be isolated from non-parents in the latter group but the time series schedules indicate higher rates for infants (aged 0-4) relative to their parental age group and lower rates for children aged 5-9 and 10-14 as education becomes increasingly important. Migrants aged 0-4 peak in intensity in 2006/07 at 59 per thousand, but the overall trend is for their intensities to fall during the period whereas those migrants in the parental age group show stability with a peak of 46 per thousand in 2012/13. The 10-14 age group is less mobile (perhaps a product of the need for stability in these important school years). Rates of inter-district migration are relatively low for those aged 45-59 and appear to remain relatively stable throughout the time series, whereas the least mobile age groups are those in the 60 plus categories. Amongst these, 60 to 64 year olds are slightly more mobile than those aged 65-74 and 75 plus. Certain older ages are associated with retirement migration (65 years for men

and 60 for women during the period), moves to areas of greater amenity and a desire to downsize; and ultimately with moves to areas which provide suitable care provision or to be closer to family.

While it is clear from the schedules presented in Figure 6.5 that migration intensities have shown some degree of fluctuation from year to year, Figure 6.6 summarises changes over the whole period by illustrating the percentage change between average rates in the first (2001-2007) and second (2007-2013) ‘halves’ of the period and revealing that all age groups experienced a fall in migration rates. At younger ages (0-14), change is between 8 and 10 per cent, while for ages 15 through 44 the change is lower (between 0.4 and 5 per cent). Thereafter, from age group 45-49 through age group 70-74, the negative percentage change gets progressively larger, with the most pronounced being for those aged 65 to 74, where migration rates are 12.7 per cent lower in the second half of the decade than the first. The oldest age group, those aged over 75 show a fall of 10.5 per cent. Many individuals in the middle age groups (25-34, 35-44 and 45-59) will be parents of those in the childhood age groups (0-4, 5-9 and 10-14), but the percentage decline in migration rates for the middle age groups is far lower than that of the childhood ages. Because not all persons in the middle age groups are parents, this difference implies that middle aged parents have experienced a greater decline in migration rates than non-parents.

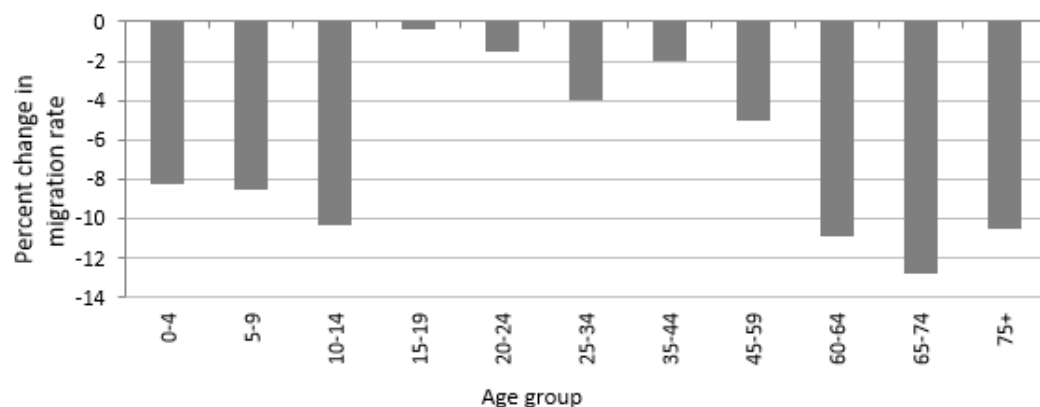


Figure 6.6. Percentage change in inter-district migration rates by age group between 2001/02-2006/07 and 2007/08-2012/13 (Source: authors’ calculations based on their time series estimates of flows between districts)

So, whilst these results suggest that there has been an overall reduction in mobility over the time period for all age groups, it is important to bear in mind that the rates reported are a

product of the number of people moving between LADs *and* the size of the population in each group. The former fluctuates throughout the time series but, overall, total flows are larger in 2012/13 than in 2001/02 (2.99 million compared with 2.88 million), with all ages except 5-14 and 35-44 showing an increase in the total number of migrants. The population is larger at the end of the time series than the beginning in all age groups, except for those aged 10-14 and 35-44 (although the population in age group 5-9 only surpasses the 2001/02 total in 2012/13, with other years being lower).

The aggregate migration intensity is a composite measure of migration in different age groups as indicated in Figure 6.5, but it also conceals spatial variations in migration propensity that reflect different processes taking place in various parts of the country at different spatial scales. One key feature of sub-national migration in the UK at the district scale is that of counterurbanisation (Champion, 1989b), characterised by losses from the major metropolitan areas and gains in the smaller towns and rural areas, as illustrated by the spatial variation in MER for the 404 LADs in the UK in 2001/02 (Figure 6.7a) and juxtaposed against the equivalent indicator for the same areas in the last year of the time series (Figure 6.7b).

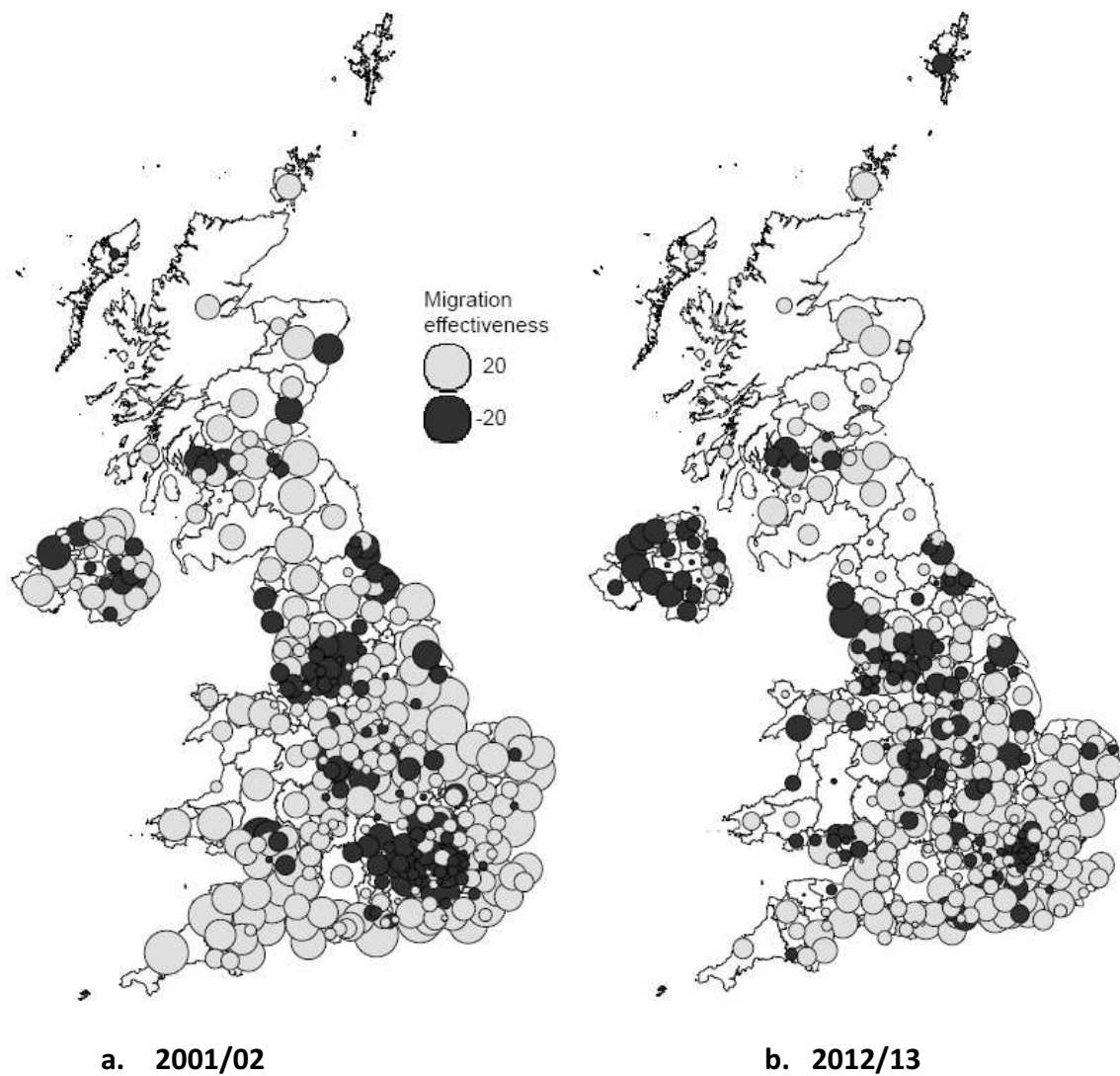


Figure 6.7. Migration effectiveness ratio for districts, all ages, 2001/02 and 2012/13 (Source: authors' calculations based on their time series estimates of flows between districts).

Note: light grey circles represent positive MER, dark grey represent negative MER. The size of the symbol represents the MER value.

When comparing the spatial patterns of MER at the start and end of the period, two striking differences are apparent. First, there is a general decline in MER across most LADs, as reflected in the general reduction in the size of the circles; the net gains and losses have tended to decrease in magnitude, suggesting a weakening of the counterurbanisation process. Second, and related to the previous observation, the London region has undergone a substantial shift in MER pattern; while London boroughs almost uniformly had negative MER scores in 2001/02, by 2012/13 the losses were limited to central London, with Outer London boroughs showing a positive MER score.

In order to get a better handle on the interaction between areas over time, by age group, we will use a classification which enables us to assess moves between aggregate ‘metro’ and ‘non-metro’ areas, broken down into seven broad age groups. These area categories are aggregations of LADs where metro areas comprise 13 core urban areas of the UK (Aberdeen, Belfast, Birmingham, Bristol, Cardiff, Edinburgh, Glasgow, Leeds, Liverpool, London, Manchester, Newcastle and Sheffield) and their immediate peripheries, while the non-metro areas comprise areas that are more distant from these urban centres. This city region classification was first used by Stillwell *et al.* (2000; 2001) and is further explained in Stillwell *et al.* (2015). Other city region classifications have been developed (e.g. Marvin *et al.* 2006) but the one used here has the advantage of extension beyond England and Wales to incorporate Scotland and Northern Ireland. Moves within the 13 metro areas and moves within associated non-metro areas (i.e. all intra-area moves) are excluded, so we are dealing with approximately 27 per cent of all UK migration (e.g. 1.8 million of the 6.8 million individuals identified in the 2011 Census) which occurs between different metro or non-metro areas.

Figure 6.8 provides an overview of the absolute number of people moving between the two area types for each year between 2001/02 and 2012/13. Some clear trends can be seen in these overall numbers. Moves from metro to non-metro declined overall, with 526,000 people making the move in 2001/02 compared with 476,000 in 2012/13. At the same time, the number of moves occurring in each year in the other direction, from non-metro to metro, increased from 405,000 in 2001/02 to 426,000 in 2012/13. Moves between non-metro areas declined in the period from 445,000 to 395,000, while the number of people moving between metro areas increased from 474,000 in 2001/02 to 520,000 in 2012/13. Thus, moves which are often categorised as counterurbanisation declined in the first decade of the 2000s, while the volume of moves in the other direction increased.

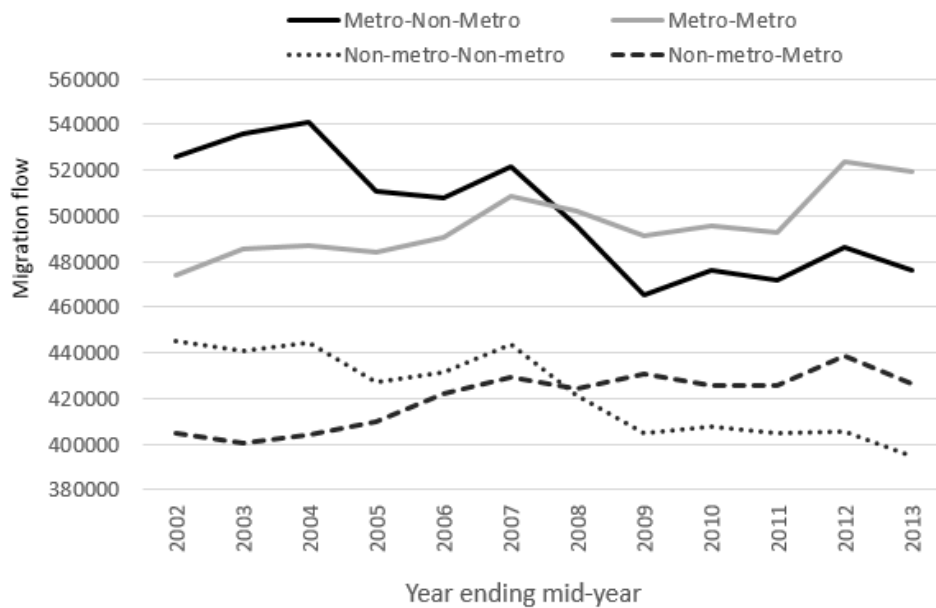
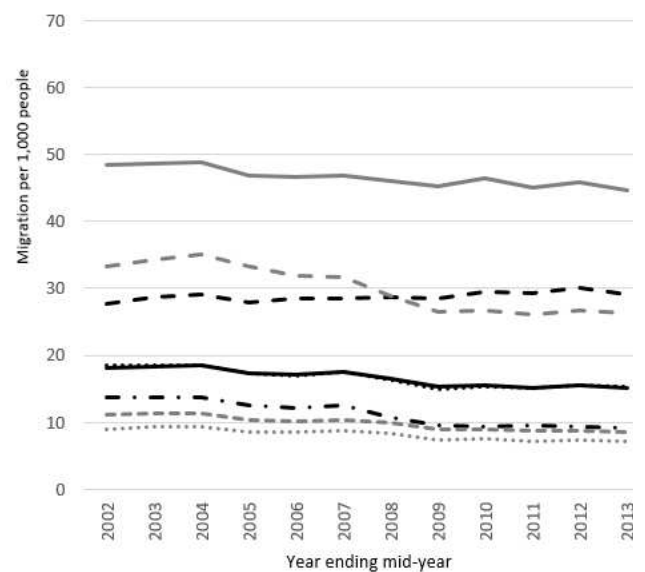
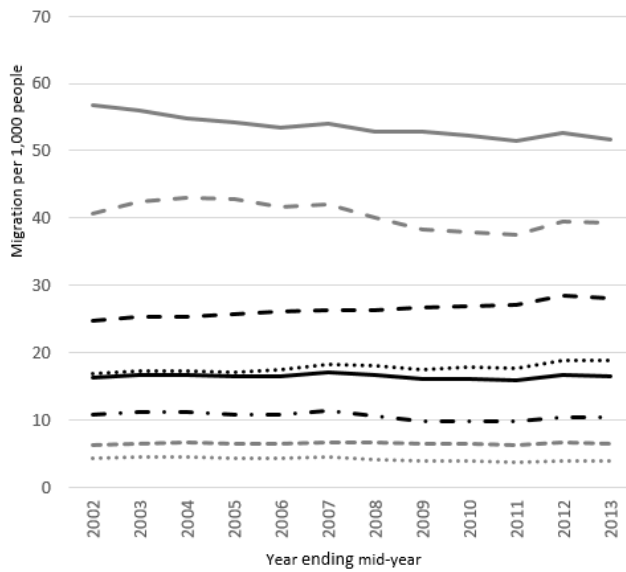


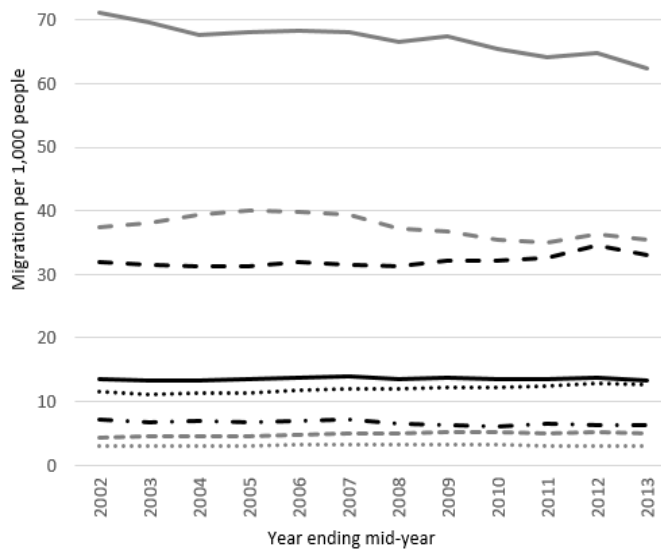
Figure 6.8. The total number of people moving between metro and non-metro areas, 2001/02-2012/13 (Source: authors' calculations based on their time series estimates of flows between districts)

Of course, metro and non-metro populations during the time series also increased, and Figure 6.9 reveals that there are some distinct differences when the time series of all-age and age-group specific rates are compared for moves between the metro and non-metro areas. Rates here have been computed using the number of people moving between metro or non-metro areas as the numerator and the total population at the origin in that age group as the denominator.

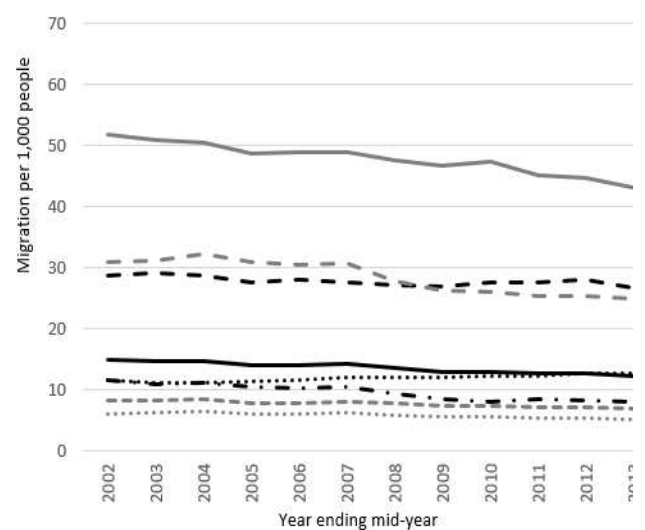


- · 0-14 - - 15-19 — 20-24 - - 25-29
 ····· 30-34 - - 45-59 ····· 60+ — All ages

a. Metro to metro areas



b. Metro to non-metro areas



c. Non-metro to metro areas

d. Non-metro to non-metro areas

Figure 6.9. Rates of migration between metro and non-metro areas, 2001/02-2012/13, by age group (Source: authors' calculations based on their time series estimates of flows between districts)

All-age total migration rates are shown by the solid black lines in on each graph in Figure 6.9. A small increase can be seen in the rate of migration between different metro areas, from 16.3 to 16.4 per thousand in 2001/02 and 2012/13 respectively (Figure 6.9a); while a small

decrease can be seen for moves from non-metro to metro areas, from 13.5 per thousand at the beginning of the time series to 13.3 per thousand at the end (Figure 6.9c). A larger decline in migration rate is evident for moves between different non-metropolitan areas (Figure 6.9d), where the rate drops from 14.8 per thousand in 2001/02 to 12.3 per thousand in 2012/13. The most notable change in total rates is for moves from metro to non-metro areas (Figure 6.9b), with a drop from 18.1 per thousand in 2001/02 to 15.1 per thousand in 2012/13.

Disaggregation by age reveals that the patterns seen for overall rates are not uniform for all origin/destination combinations. The most consistent trend across all age groups can be seen for moves between different non-metro areas (Figure 6.9d) with a notable decline at age 0-14, down from 11.6 per thousand in 2001/02 to 8.0 in 2012/13 (a fall of 32 per cent). At age 25-29, the fall in rate is around 19 per cent, from 30.9 to 25.0 per thousand. The slight increase seen in the overall rate of migration for moves between metro areas (Figure 6.9a) is mirrored at ages 45-59, 30-44 and notably at age 15-19, for whom the rate increases from 24.8 per thousand at the beginning of the time series to 28.1 at the end. It is moves by those aged 60 and over which most notably buck the trend, with their rate falling from 4.3 to 3.9 per thousand. The slight decrease in rate for moves from non-metro to metro areas (Figure 6.9c) is most apparent at age 0-14 (7.1 per thousand drops to 6.2) and at age 20-24 (71.3 per thousand to 62.5). Those at ages 30-44 and 45-59 counter the general downward trajectory, where migration rates rise from 11.6 to 12.7 and 4.4 to 5.0 per thousand respectively. The drop in migration rate for moves from metro to non-metro areas (Figure 6.9b) is evident at all ages, except 15-19 where it rises from 27.7 to 29.2 per thousand at the end of the time series. The largest declines are at ages 0-14 (from 13.7 to 9.1 per thousand), 25-29 (33.4 to 26.4 per thousand), 45-59 (11.1 to 8.5 per thousand) and 60 plus (8.9 to 7.1 per thousand).

Overall, there is variation by age but the most compelling patterns can be seen in the declining rates of migration between non-metro areas and the fall in migration rates for moves from metro to non-metro areas. Urban renaissance is a term that has been used to reflect the demographic fortunes of UK cities in the last decade (ODPM, 2006). Champion (2015) has used ONS mid-year population estimates which confirm the extent to which counterurbanisation has diminished as major cities and large towns across England have grown at significantly higher rates than in the previous two decades. Whilst international migration has been a key component of urban growth during the 2000s and increasing rates of natural change have bolstered the uplift, the reduction in the numbers of people leaving

cities for rural areas has also been a critical driver of change, together with the increase in those moving into cities, particularly more central areas where ‘city living’ has become a prominent feature of most provincial capitals. The larger scale trends reported by Champion (2015) are supported by the inter-LAD and metro/non-metro analyses reported here, but moves at a finer spatial scale are not available from the above dataset, as mentioned earlier.

London’s Migration Trends and Patterns

The capital city, when defined as equivalent to the former London GOR which is identical to the area administered by the Greater London Authority, is the hub of the UK migration system, thereby exercising a great influence over the intensity of migration across the whole country. According to the 2011 Census Special Migration Statistics (SMS), flows to and from London in 2010/11 represented nearly 15 per cent of the total migration flows between LADs in the UK, with London losing around 36,000 in this exchange. The regional MER scores shown in Figure 6.10 indicate London’s role as a net exporter of migrants alongside Northern Ireland, the North West and the West Midlands in both one-year periods, although the impact of net migration is less in 2010/11 than it was in 2000/01. Net migration is negative for all age groups apart from those in the twenties. The fall in negative effectiveness is apparent across all age groups except those aged 15-19 and 85-89, and is most emphatic in the ages from 55 to 74 (Figure 6.11). The impact of net gains of those aged 20-24 dropped between the two periods, whereas the MER value increased for those aged 25-29.

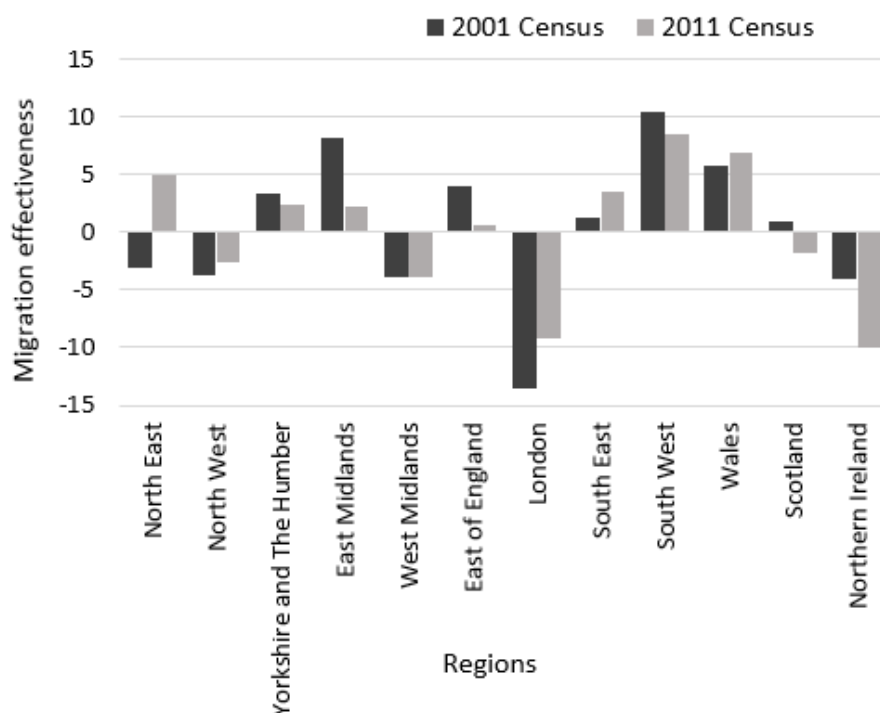


Figure 6.10. Migration effectiveness ratio for the regions, 2000/01 and 2010/11 (Source: 2001 and 2011 Census Special Migration Statistics; 2001 Census data have not been adjusted to include count of those with origin not stated)

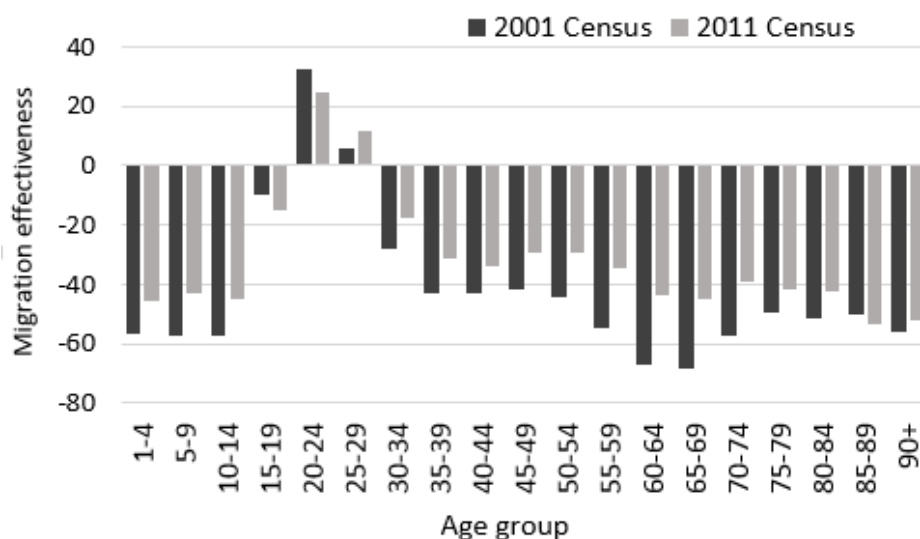
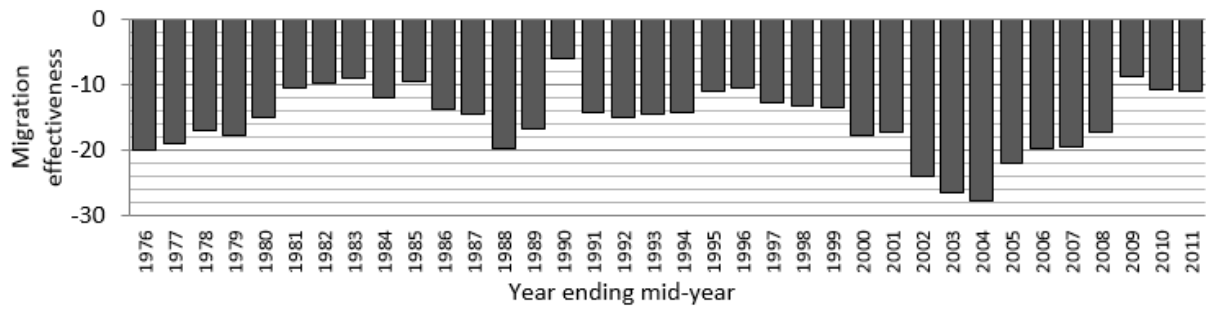


Figure 6.11. Migration effectiveness ratio by five-year age group, London, 2000/01 and 2010/11 (Source: 2001 and 2011 Census Special Migration Statistics; 2001 Census data have not been adjusted to include count of those with origin not stated)

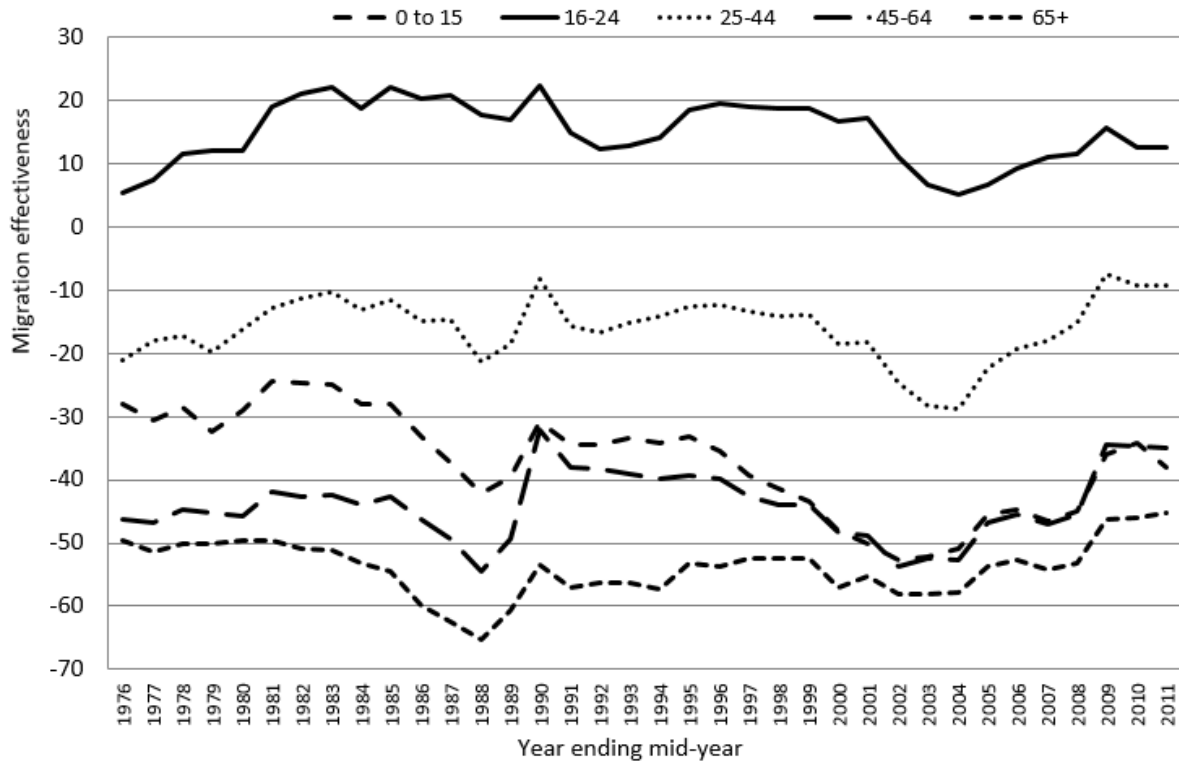
In terms of the longer year-on-year NHSCR time series, London’s negative migration with the rest of the UK can be seen to have ebbed and flowed over the last four decades with the

greatest losses tending to occur during periods of greatest national prosperity and lowest net outflows to the rest of the UK evident when economic conditions are less buoyant. The time-series MER schedule shown in Figure 6.12a for London *vis a vis* the rest of the UK indicates, in particular, the extent to which the impact of all age net migration losses increased in the first half of the 2000s and declined rapidly between 2004 and 2009 before dropping back in the last two years. All the constituent age groups follow the same trend more or less but there are distinct differences in the levels of effectiveness by age group, as shown in Figure 6.12b. At one end of the spectrum, migration associated with the oldest age group has the greatest negative MER with net migration loss from Greater London reaching a peak in 1988 at over 60 per cent of gross turnover and reducing to its lowest level, under 50 per cent, by the end of the time series. The MER schedules for those aged 45-64 and 0-15 appear to have converged during the period, having changed in parallel in the 1970s and 1980s. Whilst those in the 25-44 age group experience net migration losses throughout the time series with an impact that is lower than for the other age groups, the MER for the 16-24 year olds remains positive in each year and shows greater stability than all the other broad age groups, reflecting how the London escalator (Fielding, 1992) has continued to attract young adults from across the rest of the country.

An important conclusion from the analysis reported for London and its relationship with the rest of the country is that the 2000s were characterised by a slowdown in net losses driven by fewer out-migrants to the rest of the UK and more incoming migrants, as confirmed by Champion (2015) who uses mid-year population estimates to indicate that growth in Inner London outpaced the rest of the London primary urban area in both 2001-08 and 2008-14.



a. All ages



b. Broad age groups

Figure 6.12. Migration effectiveness ratio for London with respect to the rest of the UK, all ages and age groups, 1975/76-2010/11 (Source: authors' calculations based on NHSCR data supplied by Tony Champion)

Conclusions

The two headline conclusions that can be drawn from recent literature about the changing intensity of migration in the UK can be summarised as follows. First, there is little evidence to support a long-term decline in the relatively long-distance migration either between regions or between health areas within regions in England and Wales. There is evidence of fluctuations in the time series of migration at both scales, but these are accounted for partly by cyclical changes in national economic prosperity as well as varying conditions in labour

and housing markets and changing locational preferences amongst certain groups rather than any pronounced fall in the underlying propensity to move home. Second, analysis of longitudinal data over five censuses reported by Champion and Shuttleworth has indicated that shorter-distance migration (under 10km) has declined in each decade since the 1970s. This decline has been particularly evident in the most recent decade and those sub-groups of the population for whom the fall has been most apparent between the 1970s and the 2000s include the elderly (especially those in their sixties), the widowed and the retired. When we consider an intermediate geography of local authority districts, there is some evidence of a decline in migration rates (and effectiveness) over the 12 years since 2001/02, especially when we contrast our estimated intensities in the first half of this period with those in the second half.

The scale at which migration is taking place is therefore a critical dimension when assessing changing migration intensity in the UK because different sub-groups of the population will be involved in varying proportions at different scales and the range of motivations that determine migration behaviour will vary accordingly. We have observed how longer-distance internal migration intensities vary by age across the life course and, using the migration effectiveness ratio, we have demonstrated how the changes over time translate into spatial impacts on the population with particular reference to movements across the North-South divide and between London and the rest of the UK.

Given that the majority of migration is residential mobility taking place over short distances (i.e. mainly within LADs) and that moves of less than 10km have declined progressively whereas longer distance migration has moved up and down on a cyclical basis, it would be logical to surmise that the overall crude migration intensity in the UK has been in decline. However, with censuses in the UK only recording migration for one year per decade and NHS data only recording migration between health areas (in the long term), there are no data available which allows us to track aggregate migration intensities and provide reliable authentication of this trend. One of the key questions is why, at a time when the conventional paradigm suggests that mobility is increasing, residential mobility should have been in long-term decline in the UK, at least over relatively short distances.

We are conscious of the range of determinants of migration intensities and patterns in the UK (Champion *et al.*, 1998) at different spatial and temporal scales, together with the underlying

theoretical perspectives outlined by Fielding (2012), but we have not reported any explanatory model-based analysis of the intensities or patterns in this chapter. Neither have we considered in any detail the conventional arguments about living in an ‘age of migration’ (Castles and Miller, 2009) in which increased migration is seen as one component of the emergence of hypermobility, a feature of the ‘new mobilities’ paradigm (Sheller and Urry, 2006), whilst simultaneously, technological change is spearheading the death of distance (Cairncross, 1998) which may be having a negative effect of migration rates.

These arguments, which provide a theoretical context for temporal analysis in the UK, are covered elsewhere in this volume more thoroughly, but one possible explanation may be derived from the relationship between commuting and migration. As people have become more mobile as far as commuting to work is concerned, they may well be less concerned to move short distances to be nearer their place of work. The idea of a ‘job for life’ no longer exists, with a proportion of people shifting employer (and potentially employment location) every few years without necessarily involving a change of home. At the same time, the costs of buying and selling homes, together with the costs of moving, have increased substantially over the last 40 years. This potential shift in attitude towards commuting, combined with the increased cost of moving, may have dampened the enthusiasm to migrate unless it is really ‘necessary’ to do so (i.e. over longer distances). In some places, the availability of properties to move to in the locality has reduced, which further intensifies the disincentive to move over shorter distances.

In addition to reviewing trends in the intensity of migration at different spatial scales, the chapter has also provided insights into the spatial imbalance in flows between the North and the South and between London and the rest of the UK. We have seen how the historic North-South drift has been reversed temporarily on a couple of occasions over the last 40 years and that the cyclical pattern of net migration has been a function of changes in the gross migration taking place in both directions. The evidence in the case of London is of a slowdown in the capital’s net migration outflow to the rest of the UK, particularly during 2008/09. The analysis of time series data at LAD scale reveals a rise in the number of people moving between different metro areas between 2001/02 and 2012/13, coupled with an increase in the number of moves from non-metro to metro areas. The number of moves in the other direction, from metro to non-metro areas, has declined, as has the number of moves occurring between different non-metro areas. The most consistent patterns across different age groups

is the decline in migration rates for moves out of the most urban metro areas to the less urban non-metro areas and the decline in rates seen for moves occurring between different non-metro areas.

The slowdown in the urban exodus and decline in migration intensity in the latter part of the 2001/02-2012/13 period are likely to be due to demographic changes, primarily an increase in urban populations driven by international migration, predominantly post-accession, who live and work in the UK's core cities. This hypothesis is supported by declining rates at key ages: for example, 25-29 year olds (who move for employment) have experienced decline in migration rate when moves from metro to non-metro areas are assessed. At the same time, it is likely that urban redevelopment is having the effect of retaining populations within cities. Other researchers have referred to a process of re-urbanization taking place in parts of inner London (e.g. Docklands) and in central areas of other British cities (e.g. Butler, 2007).

These conclusions beg a series of questions about that the future may hold. Will short-distance migration intensities continue to fall? What will be the spatial impacts of changing migration intensities at different scales and what will be the cumulative impact on the aggregate migration intensity? Will migration across the north-south divide continue its dampening cyclical pattern? Will varying intensities of movement into and out of cities result in net internal migration balances that, when combined with the dynamics of natural change and international migration, produce a slowdown in city growth, as implied by Champion (2015), and mimic what Frey (2015) suggests is happening in the USA? What exactly is the relationship between the economic cycle (including fluctuations in house prices) and the national migration intensity and are the cyclical effects lagged according to geographical location? Can we contemplate a new regime of migration intensity born out of increasing housing shortages, new household-formation behaviour and new working practices or will aggregate migration rates over longer distances continue to exhibit the same stability as they have done over the past 40 years?

These are all critical questions but are difficult to answer because of the uncertainty surrounding the multitude of factors that impact on the components of change at national and local levels as well as the relative paucity of data on short-distance migration for the years between censuses. Aggregate migration intensities in the UK in the long term do not fluctuate widely over time, despite fluctuating trends for different age groups such as the 16-24 year

olds. The evidence of the past decade suggests that the impact of the Great Recession on the national internal migration intensity has been less than might have been anticipated; it was children and the elderly that experienced the largest falls in migration rates. Unless there is an upturn in the supply of appropriate housing, it is likely that migration intensities for the elderly, whose numbers are growing rapidly, will decline further.

Recognition of the shortcomings of census data in the UK has encouraged ONS, as part of the Census Transformation Programme (Teague *et al.*, 2016), to explore the potential of administrative data to produce more frequent population statistics. Since internal migration is a key component of population change at small area scales, one area of research might involve the estimation of flows within local authorities from the range of sources available. Moreover, whilst migration intensity is an important social indicator (and is the focus of this book), it is the impact of migration on population settlement which is a critical as far as planning and policy making is concerned. The primary indicator of migration impact is the aggregate net migration rate, which is determined as a function of the crude migration intensity multiplied by the migration effectiveness index (Rees *et al.*, 2016). Despite the difficulties observed in creating consistent historical time series of migration data, further work on quantifying the relationship between these three variables (net migration rate, intensity and effectiveness) at the national level would further enhance our understanding of migration within the UK. Similarly, further work is required to clarify the relationship between internal and international migration intensities and impacts over time both nationally and sub-nationally.

References

- Bell, M., Blake, M., Boyle, P., Duke-Williams, O, Rees, P., Stillwell, J. and Hugo, G. (2002) Cross-national comparison of internal migration: issues and measures, *Journal of the Royal Statistical Society A*, 165(2): 1-30
- Bell, M., Charles-Edwards, E., Kupiszewska, D, Kupiszewski, M., Stillwell, J. and Zhu, Y. (2015a) Internal migration data around the world: Assessing contemporary practice, *Population, Space and Place*, 21(1): 1-17.

- Bell, M., Charles-Edwards, E., Ueffing, P., Stillwell, J., Kupiszewski, M. and Kupiszewska, D. (2015b) Internal migration and development: Comparing migration intensities around the world, *Population and Development Review*, 41(1): 33-58.
- Boden, P., Stillwell, J. and Rees, P. (1992) How good are the NHSCR data?, In Stillwell, J., Rees, P. and Boden, P. (eds.) *Migration Processes & Patterns Volume 2 Population Redistribution in the United Kingdom*, Belhaven Press, London, pp.13-27
- Butler, T. (2007) Re-urbanising London Docklands: gentrification, suburbanization or new urbanism? *International Journal of Urban and Regional Research*, 31(4): 759-781
- Cairncross, F. (1998) *The Death of Distance: Communications Revolution and its Implications*, Orion Business, London
- Cooke, T.J. (2013) Internal migration in decline, *The Professional Geographer*, 65(4): 664-675
- Castles, S. and Millar, M.J. (2009) *The Age of Migration*, Fourth edition, Palgrave Macmillan, Basingstoke
- Champion, A.G. (1989a) Internal migration and the spatial distribution of the population, in Joshi, H. (ed.) *The Changing Population of Britain*, Blackwell, Oxford, pp. 110-132
- Champion, A.G. (ed.) (1989b) *Counterurbanisation: The Changing Pace and Nature of Population Deconcentration*, Routledge, New York
- Champion, A.G. (2005) Population movement within the UK, in Chappell, R. (ed.) *Focus on People and Migration 2005 Edition*, Palgrave Macmillan, Basingstoke, pp. 91-113
- Champion, A.G. (2015) Urban population – can recovery last? *Town and Country Planning*, August, 338-343
- Champion, A.G. (2016) Internal migration and the spatial distribution of population, in Champion, A.G. and Falkingham, J. (eds.) *Population Change in the United Kingdom*, Rowman and Littlefield, London, pp. 125-142
- Champion, A.G., Fotheringham, A.S., Rees, P., Boyle, P. and Stillwell, J. (1998) *The Determinants of Migration Flows in England: A Review of Existing Data and Evidence*, Report for the Department of the Environment, Transport and the Regions, University of Newcastle upon Tyne
- Champion, A.G., Bramley, G., Fotheringham, A. S., Macgill, J. and Rees, P. (2003) A migration modelling system to support government decision-making. In Geertman, S. and Stillwell, J., (eds.) *Planning Support Systems in Practice*. Berlin: Springer, pp. 269-290

- Champion, A.G. and Shuttleworth, I. (2016a) Is longer-distance migration slowing? An analysis of the annual record for England and Wales, *Population, Space and Place*, Published online in Wiley Online Library DOI: 10.1002/psp.2024
- Champion, A.G. and Shuttleworth, I. (2016b) Are people moving address less? An analysis of migration within England and Wales, 1971-2011, by distance of move, *Population, Space and Place*, Published online in Wiley Online Library DOI: 10.1002/psp.2026
- Courgeau, D. (1973) Migrants and migrations, *Population* 28: 95-128
- Devis, T. (1984) Population movements measured by the NHSCR, *Population Trends*, 36: 18-24
- Devis, T. and Mills, I. (1986) A comparison of migration data from the National Health Central Register and the 1981 Census, *OPCS Occasional Paper 35*, OPCS, London
- Duke-Williams, O. and Stillwell, J. (2010) Temporal and spatial consistency, in Stillwell, J., Duke-Williams, O. and Dennett, A. (eds.) *Technologies for Migration and Commuting Analysis: Spatial Interaction Data Applications*, IGI Global, Hershey, pp. 89-110
- Fielding, A.J. (1992) Migration and social mobility: South East England as an escalator region, *Regional Studies*, 26(1): 1-15
- Fielding, A.J. (2012) *Migration in Britain*, Paradoxes of the Present, Prospects for the Future, Edward Elgar, Cheltenham
- Frey, W. (2015) *Diversity Explosion: How New Racial Demographics are Remaking America*. Brookings Institution Press, Washington DC
- Kaplan, G. and Schulhofer-Wohl, S. (2012) Understanding the long-term decline in interstate migration, *Working Paper 18507*, Cambridge, MA
- Lomax, N., Norman, P., Rees, P. and Stillwell, J. (2013) Subnational migration in the United Kingdom: producing a consistent time series using a combination of available data and estimates, *Journal of Population Research*, 30: 265-288
- Lomax, N., Stillwell, J., Norman, P. and Rees, P. (2014) Internal migration in the United Kingdom: analysis of an estimated inter-district time series, 2001-2011, *Applied Spatial Analysis and Policy*, 7(1): 25-45
- Marvin, S., Harding, A. and Robson, B. (2006) *A framework for city-regions*. Office of the Deputy Prime Minister, London
- Sheller, M. and Urry, J. (2006) The new mobilities paradigm, *Environment and Planning A*, 38(2): 207-226
- ODPM (2002) *Development of a Migration Model*. Office of the Deputy Prime Minister, London

- ODPM (2006) *State of the English Cities Volumes 1 and 2*, Office of the Deputy Prime Minister, London
- Ogilvy, A. (1980) Inter-regional migration since 1971: an appraisal of data from the National Health Service Central Register and Labour Force Surveys, OPCS *Occasional Paper 16*, OPCS, London
- Ogilvy, A. (1982) Population migration between the regions of Great Britain, 1971-9, *Regional Studies*, 16(1): 65-73
- Ravenstein, E. (1885). The laws of migration. *Journal of the Statistical Society of London*, 48(2), 167-235
- Rees, P., Bell, M., Kupiszewski, M., Kupiszewska, D, Ueffing, P., Bernard, A., Charles-Edwards, E. and Stillwell, J. (2016) The impact of internal migration on population redistribution: an international comparison, *Population, Space and Place*, Published online in Wiley Online Library. DOI: 10.1002/psp.2036
- Rosenbaum, M. and Bailey, J. (1991) Movement within England and Wales during the 1980s, as measured by the NHS Central Register, *Population Trends*, 65: 24-34
- Stillwell, J. (1994) Monitoring intercensal migration in the United Kingdom, *Environment and Planning A*, 26: 1711-1730
- Stillwell, J., Bell, M., Blake, M., Duke-Williams, O., & Rees, P. (2000) A comparison of net migration flows and migration effectiveness in Australia and Britain: Part 1, Total migration patterns. *Journal of Population Research*, 17(1), 17–41.
- Stillwell, J., Bell, M., Blake, M., Duke-Williams, O., & Rees, P. (2001) A comparison of net migration flows and migration effectiveness in Australia and Britain: Part 2, Age-related migration patterns. *Journal of Population Research*, 18(1), 19-39.
- Stillwell, J. and Boden, P. (1989) Internal migration: The United Kingdom, in Stillwell, J. and Scholten, H. (eds.) *Population Geography – A Comparison of the United Kingdom and the Netherlands*, Kluwer, Dordrecht, pp. 64-75
- Stillwell, J., Rees, P. and Boden, P. (1992) Internal migration trends: an overview, in Stillwell, J., Rees, P. and Boden, P. (eds.) *Migration Processes and Patterns Volume 2: Population Distribution in the United Kingdom*, Belhaven Press, London, pp. 28-55
- Stillwell, J., Dennett, A. and Duke-Williams, O. (2010) Definitions, concepts and interaction data sources, Chapter 1 in Stillwell, J., Duke-Williams, O. and Dennett, A. (eds.) *Technologies for Migration and Commuting Analysis: Spatial Interaction Data Applications*, IGI Global, Hershey, pp.1-30

- Stillwell, J., Duke-Williams, O. and Rees, P. (1995) Time series migration in Britain: the context for 1991 Census analysis, *Papers in Regional Science: Journal of the Regional Science Association*, 74(4): 341-359
- Stillwell, J., Rees, P. and Boden, P. (1992) Internal migration trends: an overview, in Stillwell, J., Rees, P. and Boden, P. (eds.), *Migration Processes and Patterns Volume 2: Population Redistribution in the United Kingdom*, Belhaven Press, London, pp. 28-55
- Stillwell, J., Lomax, N. and Chatagnier, S. (2016) Changing intensities and spatial patterns of internal migration in the United Kingdom, in Stillwell, J. (ed.) *A Handbook of Census Resources, Methods and Applications: Unlocking the UK 2011 Census*, Routledge, London, pp. xx-xx
- Stillwell, J., Lomax, N. and Sander, N. (2015) Monitoring and visualising sub-national migration trends in the United Kingdom, in Geertman, S., Ferreira, J. Godspeed, R. and Stillwell, J. (eds.) *Planning Support Systems Smart Cities*, Springer, Dordrecht, pp. 427-445
- Stillwell, J. and Thomas, M. (2016) How far to internal migrants really move? Demonstrating a new method for the estimation of intra-zonal distance, *Regional Studies, Regional Science*, 3(1): 28-47
- Teague, A., Phelan, L. Elkin, M. and Compton, G. (2016) Towards 2021 and beyond, in Stillwell, J. (ed.) *A Handbook of Census Resources, Methods and Applications: Unlocking the UK 2011 Census*, Routledge, London, pp. xx-xx
- Thomas, M., Stillwell, J. and Gould, M. (2014) Exploring and validating a commercial lifestyle survey for its use in the analysis of population migration, *Applied Spatial Analysis and Policy*, 7(1): 71-95
- Wyness, G. (2010) Policy changes in UK higher education funding, 1963-2009, *Working Paper No. 10-15*, Department of Quantitative Social Science, Institute of Education, London