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Is Internal Migration Slowing? An Analysis of Four Decades of NHSCR Records for England and Wales

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Abstract

This paper is prompted by the widespread acceptance that the rates of inter-county and inter-state migration have been falling in the USA and sets itself the task of examining whether this decline in migration intensities is also the case in the UK. It uses the inter-area migration matrices available for England and Wales from the National Health Service Central Register (NHSCR) which provides continuous monitoring since the 1970s by broad age group. The main methodological challenge, arising from changes in the geography of health areas for which the inter-area flows are given, is addressed by adopting the lowest common denominator of 80 areas. Care is also taken to allow for the effect of business cycles in producing short-term fluctuations on migration rates and to isolate the effect of a sharp rise in rates for 16-24 year olds in the 1990s, which is presumed to be related to the expansion of the university sector. The findings suggest that, unlike for the USA, there has not been a substantial decline in the intensity of internal migration between the first two decades of the study period and the second two. While there was a 3 per cent reduction in the overall rate of migration between the regions of England and Wales between 1975-1990 and 1996-2011 (omitting the 16-24s), the rate for within-region moves between areas was some 10 per cent higher in the latter period. The main evidence for decline relates to particular age groups of between-region migration, where the rate for those aged 65 and over shrank by a quarter and that for 0-15 year olds was down by a tenth. In general, however, if there has been any major decline in the intensity of address changing in England and Wales, it can only be for the shortest-distance (within area) moves that the NHSCR does not record.

Key words: Internal migration, Migration intensity, Between-area moves, Long-term trend, England and Wales.

JEL Classifications: J11, J61, O15, R23

Introduction

It appears to be conventional wisdom that the world is becoming increasingly mobile and that we are living in ‘the age of migration’, yet there is some evidence that the propensity to move home has begun to decline (see Cooke, 2013, for a review). So far this phenomenon has been most extensively documented for the USA where the decline in internal migration rates dates back to at least the 1980s, but research on a new repository of internal migration records from around the globe suggests that this is not an isolated case (Bell and Charles-Edwards, 2013; Bell et al, 2015). As yet, however, that project does not provide a time-series analysis of the situation in the UK. There the most recent study (Lomax et al, 2014) reveals a marked decline in the internal migration rate, but covers only the decade 2001-2011 and associates this change primarily with the latest in a series of recessions that have caused only temporary dips in migration intensity.

This paper sets itself the modest, essentially descriptive, goal of presenting the results of a study that has tracked internal migration for England and Wales, over a considerably longer period than the latest decade. The paper begins by briefly providing context in terms of theoretical and international perspectives and especially of the US experience. Then it reviews previous work on the intensity of internal migration in the UK and explains why the best starting point for studying long-term trends in this is the National Health Service Central Register (NHSCR). Even so, the NHSCR data are not straightforward to use for this purpose, so the paper sets out the steps taken to derive as consistent a time series as possible before using it to discover whether there has been a similar decline in internal migration rates there as in the USA.

Trends in migration rates: theoretical and international perspectives

There seems to be a widely-held belief that we are living in an increasingly mobile society, with talk of the ‘age of migration’, of a ‘world on the move’, of the emergence of a ‘hypermobility’ that is eroding attachment to place, and of a ‘liquid modernity’ that is associated the end of states as containers of societies (see, for instance, Bauman, 2000; Robbins, 2000; Urry, 2007; Castles and Millar, 2009; Adey,

2010). These ideas have a long currency in migration theory, most notably in Lee's (1966) refinement of Ravenstein's nineteenth-century 'laws of migration' and in Zelinsky's (1971) 'hypothesis of the mobility transition', but they have taken on even greater salience with the rise of the New Mobilities Paradigm and the 'mobilities turn' that is said to be transforming the social sciences (Cresswell, 2006; Hannan et al., 2006; Sheller and Urry, 2006). Additionally, much social theory assumes that migration and mobility will increase over the long term because of the shift in population composition towards the higher-skilled 'service class' groups that have a tradition of greater geographic mobility (see Fielding, 2012; Green, 1992, for reviews).

Yet there are now some indications that this idea of increasing mobility does not apply to all types of mobility nor perhaps to all geographical contexts. In particular, there is mounting evidence of a slowdown in the propensity of the US population to make permanent changes in home location (see next section). More widely, the most comprehensive intelligence is provided by the IMAGE (Internal Migration Around the Globe) project, which has established an inventory of internal migration data collections for a large number of countries (see Bell et al., 2014, 2015). So far the work of this project has been primarily cross sectional, but one output (Bell and Charles-Edwards, 2013) includes trend analysis for a sub-sample of countries. As regards countries of the more developed world, and focusing on five-year migration (which is more sensitive to recent changes than their alternative measure of lifetime migration), their analysis shows that between the 1990 and 2000 rounds of censuses the intensity of internal migration had declined for Australia, Canada, and Switzerland as well as the USA, but had risen in Greece and Portugal. For the three more developed countries for which data was then available for the 2010 census round, the five-year intensity had fallen further in Australia and Canada, this being for all three of the geographical scales examined for both, and it had also declined in New Zealand at the higher of the two scales examined but had not changed for the lower one.

The somewhat mixed picture emerging from the IMAGE project will no doubt become clearer as its sample expands, especially with the inclusion of more countries' results from the latest round of censuses. On the other hand, the results from the latter will need to be interpreted with some care, because – to the extent that they are

derived from the address-five-years-ago question relating to 2005-2010 – it can be expected that they will be affected by the damping down of migration by the so-called Great Recession and so are unlikely to be an accurate reflection of the longer-term trend. This is especially crucial in drawing comparisons with the results from the 2000 census round which relate to a period in the later 1990s that was characterized by economic boom for the majority of more developed countries, when migration rates might be expected to be higher than their long-term average. While five-year rates are definitely preferable to having one single-year rate per decade, they cannot fully smooth out shorter-term fluctuations arising from the business cycle, a point that we return to below.

The US experience

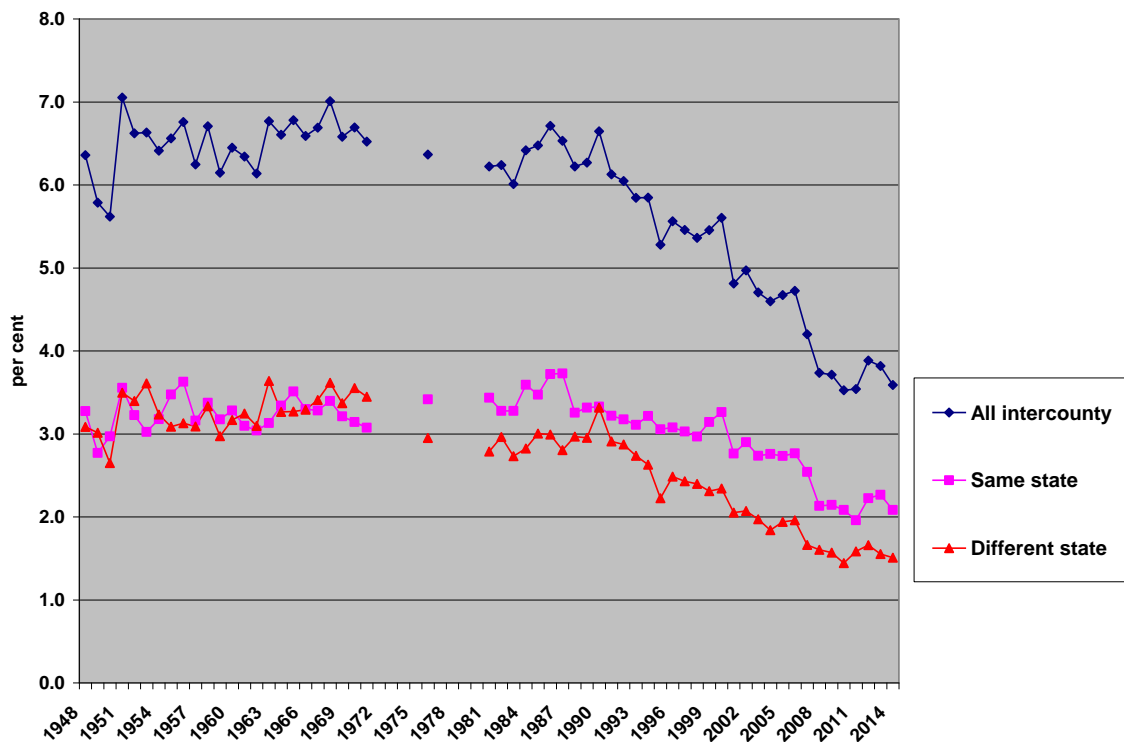
As it is the USA for which the long-term decline in internal migration rates has so far been examined most comprehensively, this section now gives more details of this case in order to provide an indication of the type of changes to be alert to in the UK. Cooke (2011) clearly revealed the marked drop in both inter-state and inter-county migration rates there, most notably in his chart (p.194) that used Current Population Survey (CPS) data to track annual rates for 1948-2009. The main decline was found to have set in after the early 1980s, at which point the rates were not substantially different from those prevailing in the 1950s, and was especially steep from 1999 onwards. The fact that the latter predated the Great Recession by several years prompted an analysis that suggested that ‘it is not just the economy’ behind this fall but also ‘the rise of secular rootedness’ (p.193). Even though it has subsequently been recognized that the CPS data for 1999-2005 had been overestimated (Cooke, 2013; Kaplan and Schulhofer-Wohl, 2012a), this did not undermine Cooke’s overall conclusion that migration rates were falling and it was due to more than an economic-cycle effect, not least when taken in conjunction with the fall starting in the 1980s.

While the robustness of the CPS has been challenged on other grounds too, including the fact that its data on recent rates do not precisely match those calculated from other continuous sources such as the American Community Survey and the Internal Revenue Service (see, for instance, Kaplan and Schulhofer-Wohl, 2012a), the trend over time shown by the various datasets is similar. Moreover, there now appears to be

a much wider consensus on the downward trajectory in US migration intensities than a decade ago when Wolf and Longino (2005) were moved to write about ‘Our “increasingly mobile society”?’ The curious persistence of a false belief’. Since then the US’s declining rates have been confirmed by several other studies including Frey (2009), Kaplan and Schulhofer-Wuhl (2012b, 2012c), Molloy et al. (2011, 2013) and Partridge et al. (2012). It has also now been relayed by a number of media reports including Jaffe (2012) and Lowery (2013).

The latest available data provided by the CPS data on inter-county migration is plotted in Figure 1. This incorporates the revised data for 1999-2005 as estimated by Kaplan and Schulhofer-Wuhl (2012a), while it should also be noted that the CPS omitted the one-year address-change question eight times during the 1970s.

Figure 1. US inter-county migration rate, 1948-2014, by within same state and between state (Source: calculated from Current Population Survey data)



Despite the 1970s missing data, the trajectory for all inter-county moves in Figure 1 is clear, in that the annual rate for most of the 1980s fluctuated between 6 and 7 per cent, very much as it had done in the 1950s and 1960s after being somewhat lower at the end of the 1940s. The pattern then changes dramatically after the mid 1980s, with a

steep decline that is merely accentuated by the ‘dot com’ recession of 2001 and the Great Recession of 2008. The effect of the latter lingered on for another three years before a degree of rebound in 2012, after which the long-term decline seems to have set in again. This general trend is fairly similar for both elements of inter-county movement, with the main exception being that the inter-state rate looks as if it started its decline some two decades earlier. Since the 1980s both rates have dropped largely in parallel with each other, albeit with the economic recessions (including that of the late 1980s) seeming to impact less severely on the inter-state rate.

What lies behind this marked decline in between-area migration in the USA? With this long-term decline now accepted as fact, inspection of the US literature cited above now offers such a wide range of explanations that it seems strange that there has ever been any doubt about this in the way that Wolf and Longino lamented. One is that some elements of population composition have been shifting towards the traditionally less migratory groups such as the elderly, owner occupiers and dual-earner households. Secondly, in terms of the space economy, places are becoming less differentiated in some aspects of their industrial structures at the same time as certain types of jobs are becoming more concentrated in a small number of major cities, both somewhat paradoxically militating against the need to move for job reasons, as too does the filling of more vacancies by migrant labour from other countries. Changing terms of employment and increasing regulation in labour and housing markets have been raising the barriers to migration, while rising car ownership and more fuel-efficient engines means less need to move home when changing jobs. Home working, weekly commuting and FIFO (Fly In, Fly Out) may also substitute for home moving, while easier access to information on the web may reduce the number of moves that ‘fail’. Meanwhile, the combination of the trend towards an ever more materialistic society and the growing importance of local social capital make it both more costly and less attractive to move home. Taken together, all these factors make migration decline now seem like the most natural of developments. Given that most, if not all, of these economic, technical and societal developments are common to the UK, the intensity of internal migration would also have been expected to be in decline there too, so has it?

Studying trends in the intensity of internal migration for the UK

Migration research has been and continues to be an extremely vibrant element of the social sciences in Britain (see, most notably, Champion and Fielding, 1992; Stillwell et al, 1992a; Fielding, 2012; Smith et al, 2015). Interest in overall rates of migration appears to have been strongest in the earlier decades of migration recording, following the Census's introduction of the question on address one year ago in 1961 and the inception of the continuous monitoring of migration using the NHSCR in 1971. Most of these studies, however, focused on only a relatively short span of years; for instance, Ogilvy (1982) on 1971-79, Devis (1984) on 1971-82, Rosenbaum and Bailey (1991) on 1971-89 and ODPM (2002) on 1983-98. As a result, their main findings concerned the way in which the intensity of migration varied with the state of the economy. This was also the prevailing theme of the review of the 1960-89 trend by Stillwell et al (1992b), which documented a rise of 9 per cent in the migration rate in the 1960s, a fall of 21 per cent between the 1971 and 1981 censuses but then – as the country emerged from the 1980-81 recession – a steep rise in rate back up to the 1971 level by the end of the decade.

More recently, however, migration research has been dominated by qualitative research on migration behaviour and by quantitative studies focusing on the geography of migration flows, the latter most commonly in terms of the role of net migration in population redistribution (see reviews by Fielding, 2012; Smith et al, 2015). An honourable exception is the work of Lomax et al (2013, 2014), which estimated a consistent time series of data on migration flows between every local authority in the UK and every other one and calculated annual trends in national-level measures of migration intensity (see Lomax et al, 2014, p.30), but this work covered only the period 2001-2011 when the principal feature was the impact of the Great Recession in lowering the overall intensity of migration and in slowing the net redistribution of population during the second half of the decade. Also, Champion (2005) charted between-area migration rates for 1975-2004, but it was subsequently discovered that the ONS data used for this was not based on a consistent geography (see below).

A key reason for this dearth of studies on the long-term trend in overall migration intensity is that it is extremely difficult to monitor this in a meaningful and robust way. The chief problem with the decennial Census for this purpose is that, by definition, its one-year change-of-address question is asked only once every 10 years (apart from the extra observation from the 10% Census of 1966), with the respective years varying in relation to the timing of the business cycle, as noted above. Secondly, the comparability of its migration data over time has been compromised by a change in definition of usual residence for students living away from home in term time, this being for vacation address (normally parental home) up till 1991 but term-time address thereafter. As a result, the one-year change-of-address data from the 2001 and 2011 censuses includes education-related moves and in particular the longer-distance moves made by those either going up to or coming down from university in the pre-census year and also all the local accommodation changes for those in the middle of their courses then.

For present purposes, the NHSCR has several distinct advantages over the data from the censuses' one-year change-of-address question, despite suffering from some idiosyncrasies of its own. On the positive side, the NHSCR provides a continuous record dating from 1971 for inter-regional moves and from 1975 for intra-regional migration and has always included migration to and from educational establishments insofar as these have been recorded by the health services. Also, apart from 1975-83 when only 10 per cent of records were processed for migration monitoring, it has the benefit of almost 100 per cent coverage of the population, as even those with private-health insurance are almost all registered with the NHS as well. This degree of coverage also marks the NHSCR out from the household surveys and panel studies that have been conducted in the UK over various periods since the 1940s, as the latter sources invariably cover less than one per cent of the population and also differ both between and within themselves in their coverage of the so-called 'institutional population' (i.e. those not in households).

There are a number of downside features to the NHSCR, but most of them can either be deemed to have minimal impact for present purposes or can be worked around. One is that there will be a time lag between a person moving home and the information about this event being recorded in the NHSCR, but an allowance is made

for this in the dating of the records released. Related to this is that people vary in terms of the speed with which they register their change of address with the NHS, with the likelihood of some people making a second move before the first one has been registered, but ONS assumes that the proportion of address changes thereby missed remains constant over time. More problematic is that, while moves to and from university are included, the degree of coverage of these moves depends on whether or not a student registers with a doctor while at university, which depends in its turn partly on the extent to which a university enforces this precaution. While ONS has recently been getting a better handle on this issue by comparing NHS registrations with universities' student lists, there is no way in which the results of this work can be backdated to the 1970s, so this is an aspect that needs to be born in mind in interpreting the results of NHSCR-based analyses.

The biggest challenge of using the NHSCR migration data for time-series research is to ensure that the data relates to a consistent geography. This step is crucial, because unlike the Census the NHSCR has up till now released data on migration between health authority areas and excludes within-area moves. This is not a fundamental drawback in itself, in that the US data analysed by Cooke (2011, 2013) and updated in Figure 1 is also for between-area migration. However, it does become an issue if the geography of areas alters over time, which – unlike for the remarkably stable geographies of counties and states in the USA – has occurred rather often in the UK, partly as a result of sub-national government reorganisations and partly through additional bouts of administrative changes within the health services themselves. Spatial reorganisation was something that Lomax et al (2013, 2014) had to allow for, even though covering just the one decade 2001-2011, and it was also the cause of the problem with the analysis by Champion (2005) mentioned above, in that the annual data supplied by ONS turns out to have been based on the geography of health areas in place in the respective years. Just as the level of inter-regional migration will be lower than that for a finer-grained set of areas, so too will the level of the latter become higher if the number of areas is increased (e.g. by splitting the previous units) and vice versa (e.g. by amalgamation of areas).

The principal contribution of this paper is to put the NHSCR-derived data on between-area migration on a consistent geographical basis, so that like is compared

with like over the full time series and the trends in migration intensity are accurately depicted. This is done just for England and Wales, as Scotland and Northern Ireland have different recording systems maintained by their separate national agencies (see Lomax et al, 2013). The process draws on a suite of ONS spreadsheets containing the origin/destination matrix for each year ending June for 1976-2011 and thus revealing how the NHSCR geography altered over the 36 years of sub-regional migration data. As it was found that most of the changes involved the splitting or merger of areas, the approach was to identify the lowest common denominator (LCD) of areas. This was preferred to the use of modelling to estimate the migration flows missing in particular years from the most detailed geography, which would have required the assumption of stability over time in the within-larger-areas patterning of flows.

The main changes in health-area geography have been as follows. The greatest degree of discontinuity occurred in 1999-2000 with a major set of alterations in health-area geography, with many areas being combined (most for a short period, some more permanently) and others being split. Wales was especially affected at this time as the original 8 county-level units used for 1976-98 were reduced to 2 reporting units for 1999 and 2000 and then in 2001 became 5 new areas that did not respect the former boundaries, leaving just the two areas of 1999-2000 as the LCD. Cambridgeshire and Norfolk were separated just for the one year 1999, so in this case the flow between them has been estimated for the two adjacent years so that they could be kept separate in the LCD solution. Secondly, in 2001 a number of mainly county-level reporting units were split into two or more separate areas, though most of these reverted to the previous geography in 2008. The only substantial change before 1999 was the splitting of Middlesex into five groups of London Boroughs, this officially in 1986 but taking several years to become fully effective (when there was a separate area category called 'Middlesex not stated'), so the LCD approach keeps to the earlier geography for London.

The full schedule of reporting areas used over the period from July 1975 to June 2011 inclusive is shown in Annex 1, grouped by region and listing the changes that took place and their timing (i.e. when first used in the year ending June). The last line of each regional section shows the LCD set of areas that have been used across the 36 years of migration. A total of 80 areas in the final set is used for calculating migration

rates on a consistent geographical basis, as shown in Table 1. This compares with the 104 reporting units that were in place between 2001 and 2007 inclusive and the 98 areas for 1986-1998 (99 if 'Middlesex not stated' is considered separately). Finally, it should be noted that the annual migration-matrix spreadsheets supplied by ONS had already been adjusted for the change in regional geography that took place in 1996, when the Standard Statistical Regions (SSRs) were replaced by what are now the 'former Government Office Regions', which are the ones used to denote the regional level (along with Wales) in what follows.

Table 1. The areas comprising a consistent NHSCR-based geography for years ending June, 1976-2011, by former Government Office Region

North East (6)	East Midlands (5)	London (12)
Gateshead & South Tyneside	Derbyshire	Middlesex
Newcastle & North Tyneside	Leicestershire	Barking & Havering
Sunderland	Lincolnshire	Bexley & Greenwich
Cleveland/Tees	Northamptonshire	Bromley
Durham	Nottinghamshire	Camden & Islington
Northumberland		City & Newham & Tower Hamlets
	West Midlands (11)	Croydon
North West (12)	Birmingham	Kensington & Chelsea & Westminster
Liverpool	Coventry	Kingston & Richmond
Sefton	Dudley	Lambeth & Southwark & Lewisham
St Helens & Knowsley	Sandwell	Merton & Sutton & Wandsworth
Wirral	Solihull	Redbridge & Waltham Forest
Bury & Rochdale	Walsall	
Wigan & Bolton	Wolverhampton	South East (9)
West Pennine	Hereford & Worcester	Berkshire
Manchester	Shropshire	Buckinghamshire
Salford	Staffordshire	East Sussex
Stockport	Warwickshire	Hampshire
Cheshire		Isle of Wight
Cumbria & Lancashire	Wales (2)	Kent
	North Wales & Dyfed & Powys	Oxfordshire
Yorkshire & The Humber (10)	Morgan & Bro Taf & Gwent	Surrey
Barnsley		West Sussex
Doncaster	East of England (6)	
Rotherham	Bedfordshire	South West (7)
Sheffield	Cambridgeshire	Avon
Bradford	Essex	Cornwall
Calder & Kirklees	Hertfordshire	Devon
Leeds	Norfolk	Dorset
Wakefield	Suffolk	Gloucestershire
Humber		Somerset
North Yorkshire		Wiltshire

Source: see text.

The results

This section sets out the findings derived from collapsing the full migration matrix of between-area flows for each year to the consistent geography of 80 areas shown in Table 1. Before examining the picture for all flows, a separate look is taken at the trend for between-region flows and then at the flows between areas within regions, parallel to the distinction between ‘inter-state’ and ‘inter-county within-state’ flows made for the USA in Figure 1. When we come to combine these two types of flow, which can be broadly categorised as longer- and shorter-distance respectively, we can also compare them directly to see whether there are any major differences in their trajectories. Additionally, at each stage, the all-persons rates are disaggregated by the broad age groups available from 1975/76, as this enables the isolation of the main student age groups – a useful precaution given the concerns described above.

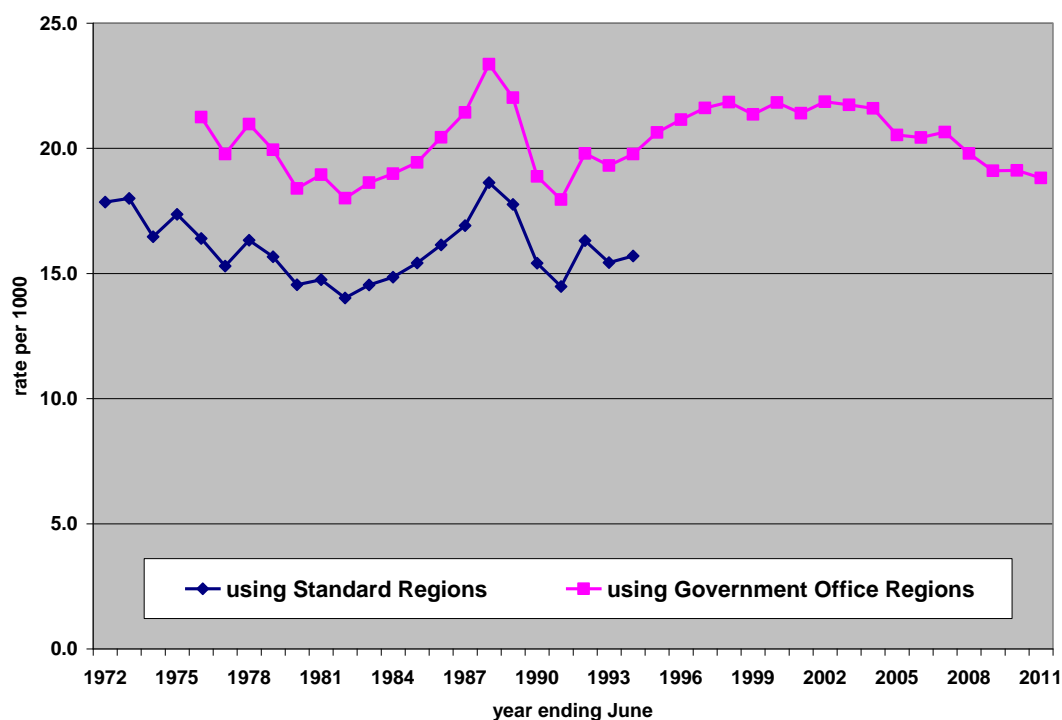
Migration between the regions of England and Wales

This section deals with the flows of people between the regions of England and across the border between England and Wales. The results of calculating rates per 1000 residents from the aggregate number of flows recorded in each year ending June are shown in Figure 2. Two series are shown that relate to two different sets of English regions, allowing the full coverage from 1971/72 through to 2010/11 and in the process also revealing the importance of keeping to a consistent geography.

The series that begins with the year ending June 1972 is based on the Standard Statistical Regions that were used for the reporting of English regional statistics until the mid 1990s. These underwent some alteration as a result of the local government changes that became effective in 1974, but their effect on overall between-region migration was deemed minor enough to be ignored by Ogilvie (1982) in her analysis of 1971-79 trends, so they are ignored here too. The general pattern is the one that is familiar from the previous studies reviewed above, most notably Stillwell et al (1992) who observed the substantial decline in migration rate from a high around 1970, followed by an even steeper rise after 1981 as the country moved out of recession. It then shows that the rate peaked in the year ending June 1988 before plunging even more steeply into the 1990/91 recession. In fact, ONS points out that the low point in 1991 may be somewhat exaggerated because this coincided with the computerisation

of the recording system when at least some moves may have been missed or entered late (perhaps helping to account for the out-of-line rate for 1992). Following the lead of ODPM (2002), we make no attempt to adjust for this.

Figure 2. Between-region migration rate, for years ending June, 1972-2011, using alternative regional geographies (Source: calculated from the NHSCR-based migration matrix supplied by ONS. Crown copyright.)



Clearly, the patterning of this 23-year SSR-based series is dominated by the effects of the business cycle and, by itself, does not provide a firm basis for detecting any longer-term trend in the intensity of between-region migration. The other series shown in Figure 2 uses the former Government Office Regions (GORs) and extends the record for a further 17 years to 2011, when there was a major discontinuity in methodology, prompting us to stop at this point. This shows that, after the blip of 1992, there was a steady increase in rate till 1997, followed by a plateauing for the next 7 years at around 22 per 1000. In 2005 it dropped by a point and then between 2007 and 2009 it dropped by another 1.5 points. The main conclusion from this series is that the trend since the early 1990s has been much less volatile than before then, but this could also be seen to have its roots in the economy, given the ‘long boom’ that occurred after the 1990-91 recession (hardly dented by the ‘dot-com recession’ of 2001) and prompted the assertion by the then Chancellor of the Exchequer Gordon

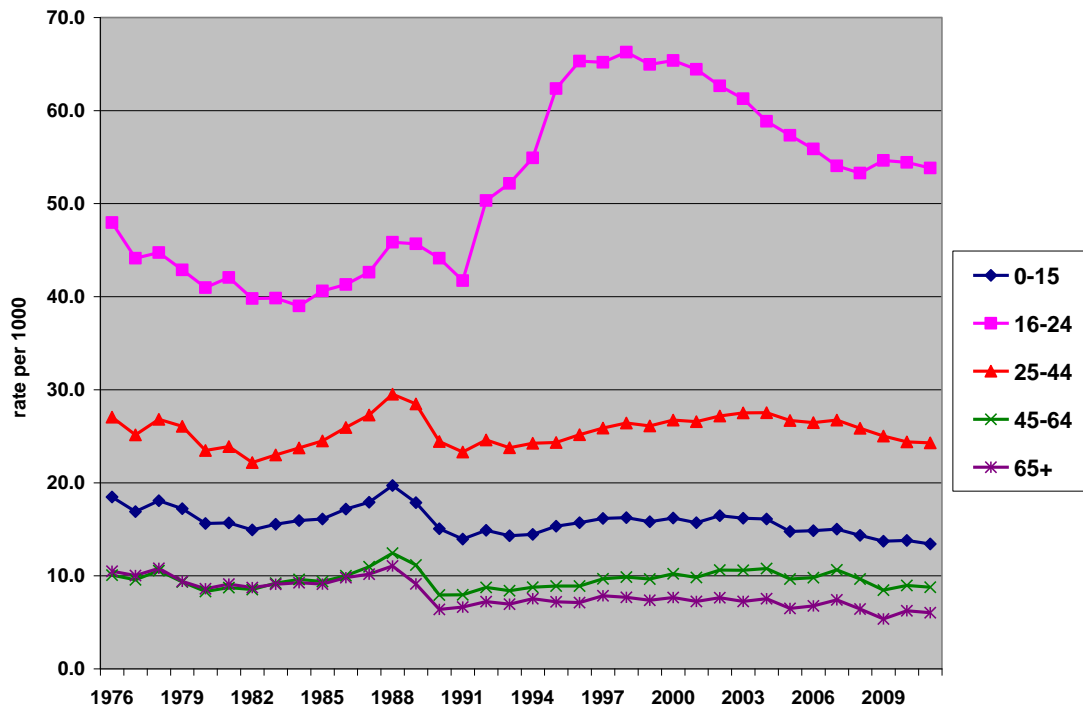
Brown that the ‘boom and bust’ cycle had been abolished. It is notable that the first dip in migration rate then predates the 2008-09 recession by three years, but this would be consistent with the surge in labour migration arrivals from the EU Accession (A8) countries in 2004-05 reducing the need for and/or opportunity of inter-regional migration by the native population in search of work.

The fact that the GOR-based rate is substantially higher than the SSR-based rate, even while following its ups and downs closely over their common period of 1975-1994, is testament to the major effect that a changing geography can have on between-area flows. The key change between the two geographies relates to south-eastern England, which in the SSR system was split into two regions – East Anglia with just three counties and the 13 counties of the South East SSR including Greater London – but now comprises three GORs, of which the county of Greater London is one by itself, with the South East and East GORs splitting the remainder between them. As Greater London substantially underbounds the London urban area and even more so its labour and housing market areas, it is strongly linked to its surrounding counties by migration flows in both directions. Indeed, more detailed analysis (not shown here) reveals that in most years from 1975 onwards at least one-fifth of the between-region migration shown for the GOR-based system in Figure 2 is made up of just the flows between London and its two adjacent GORs.

Before attempting any formal test of the long-term trend in the between-region migration rate, it turns out to be instructive to disaggregate the overall rate into the five broad age groups that ONS provides for all years from that ending in June 1976 (age was not collected before 1975). The most impressive feature revealed by Figure 3 is the way in which the rate for 16-24 year olds shoots up from just over 40 per thousand in 1991 to 65 in 1996 and stays at around this level for another 5 years before steadily falling back and stabilising at around 53-54 per thousand for the last 5 years of the study period. While it is not surprising that the rate for 16-24s is much higher than for the other age groups, as the high propensity of young adults to move home over longer distances is well attested by previous research, the scale of the post-1991 increase is completely out of line with the trend for the other four age groups. The primary explanation lies in the expansion of the university sector at this time and the drive to increase participation in higher education, given that there is a stronger

tradition of attending a non-local university than in most other countries. The fact that the rate then subsided in the final decade covered is likely to be associated with the introduction of tuition fees and the associated switching of higher-education costs from the state towards the students and their families, not markedly affecting participation but encouraging more to attend the university in their home area. What, however, cannot be known is whether a portion of this fluctuation may have arisen from any change in the proportion of students registering with health services while away at a non-local university.

Figure 3. Migration rate between the former Government Office Regions of England and Wales for years ending June, 1976-2011, by age (Source: see Figure 2)



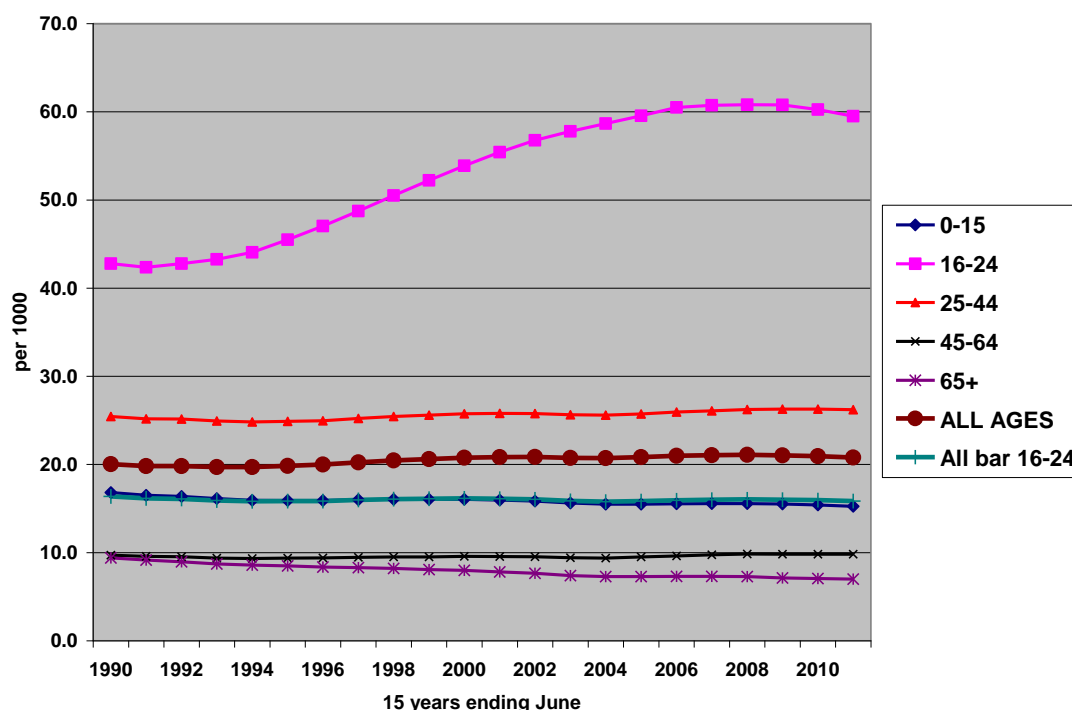
It is unfortunate that this special feature affects the age group that is anyway the most mobile one in migration terms and where any long-term trend in migration rate would, all other things being equal, be expected to have the greatest absolute effect on the all-age rate. Looking at the other four age groups, the long-term trend for one of them certainly seems to be downward: for those aged 65 and over, the rate is always lower after 1990 than during the previous 15 years. There would also appear to be something of a downward trend for those aged 0-15 years, but by contrast the post-

1990 rates for both the 25-44 and the 45-64 year olds lie within the range recorded for them in the previous 15 years.

A more precise test of such longer-term tendencies can be undertaken by averaging out rates over periods that try and span economic cycles. An obvious starting point is to divide the 40 years of data shown in Figure 2 into four separate decades. This requires the estimation of the pre-1975 SSR-based rate for the GOR-based rate for which the longer series is available (done here simply by applying the mid-1970s ratio of the two to the earlier years' data for the former base). The result yields an average annual rate of 21.0 per 1000 for 1971-81, which compares with 19.9 for 1981-91, 20.9 for 1991-2001 and 20.4 for 2001-2011. The overall impression from this calculation is of relatively little long-term change in the intensity of between-region migration, with the latest decade's rate being only some 3 per cent below that of the 1970s. on the other hand, it must be born in mind that the overall rate for the 1990s is boosted by the sharp rise in the 16-24s' rate, which might be considered a special feature in the wider scheme of things (see above). To allow for that, one needs to focus on the age-specific series that is available from 1975. Also, given the 'long boom' that preceded the recession of 2008-09, a minimum of 15 years is really needed to neutralise the cyclical effect.

Figure 4 takes account of these two latter points by showing the 15-year running averages for each of the five age groups, as well as for all ages and also for all ages bar the 16-24s, with the series running from the 15 years ending 1990 (i.e. July 1975 to June 1990) to the 15 years ending 2011 (i.e. July 1996 to June 2011). On this basis, the all-ages running average starts at 20.0 per 1000 and ends up a little higher at 20.8 (an index of 103.7 if the initial observation is set at 100) but this is primarily due to the boost given by the 16-24s whose average rate rises from 45.2 to 58.9 (an index of 139.1). Excluding the 16-24s, the running average rate drops somewhat from 16.4 to 15.9 per 1000 (an index of 96.9, i.e. a decline of around 3 per cent). As regards the other four age groups, the index of the endpoint of the series is 90.7 for the 0-15s, 103.1 for the 25-44s, 100.9 for the 45-64s and 74.4 for those aged 65 and over. In case the 15-year averages are deemed inadequate for allowing for the business-cycle effect, the indices for the 20-year running averages for these four age groups are, respectively, 93.4, 102.7, 101.2 and 79.8.

Figure 4. 15-year running averages of migration between the former Government Office Regions of England and Wales, by age (Source: see Figure 2)



The conclusion from this set of calculations, therefore, is that since the 1970s there has been a marked decline in the propensity of the elderly to make a between-region move and also a reduction for children. The 25-44s and 45-64s have not shared this tendency, with small increases in rate that do not wholly offset the declines at the age extremes. By contrast, the step rise in rate for the 16-24s shifts the overall rate from the 2-3 per cent overall decrease averaged across the other four age groups combined to a 3-4 per cent increase.

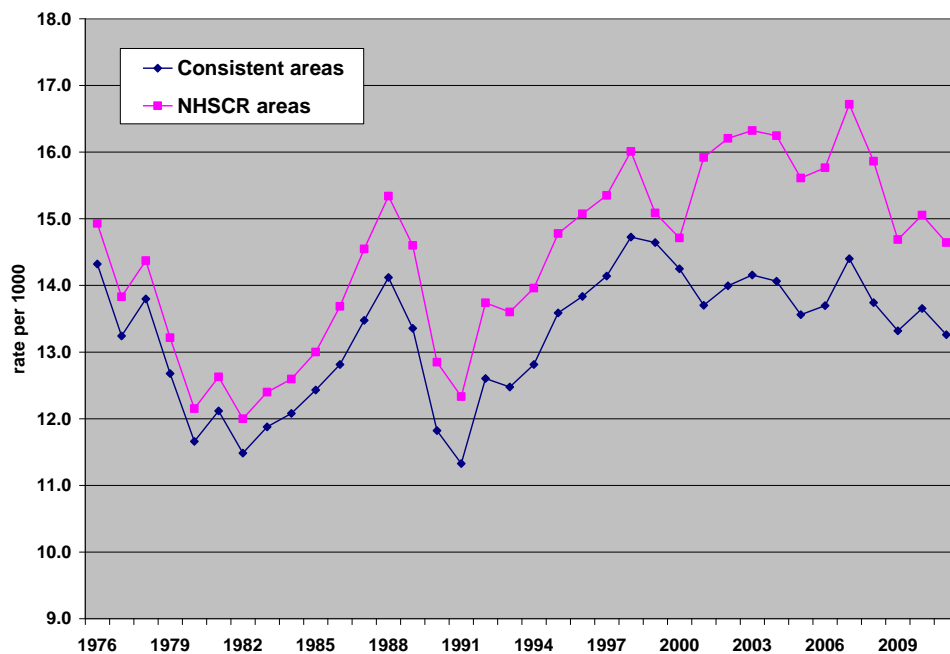
Migration between areas within the regions of England and Wales

How does the long-term trend for within-region migration differ from that for between-regional migration? Does it follow the latter in the same way as the USA's between-state and between-county migration rates run largely in parallel with each other? This section answers these questions by reference to the sub-regional migration dataset that, as described previously, has been put on a geographical basis that is consistent over the full-time period from 1975/76 onwards. As for the 'between-

county within state' record in Figure 1, the data refers to migration between areas but not crossing a regional boundary.

Figure 5 shows the trend in within-region migration rate for all ages combined and compares this with the unadjusted series so as to demonstrate the importance of allowing for the changing geography of health areas.

Figure 5. Within-region migration rate, for years ending June, 1976-2011, all ages, for a consistent geography compared with those recorded using contemporary NHSCR areas (Source: See Figure 2)



The two series are quite similar over the first decade of the study period (when the main difference is the need to collapse Wales into just two areas for the consistent series), but widens in the late 1980s when an increasing proportion of the Middlesex records were being allocated to the five areas that this former county was then split into. The gap narrows markedly in 1999 and 2000 during the period of substantial health-service reorganisation that subsequently led to a proliferation of health areas before returning to something close to the previous geography in 2009. The adjustment for 2001-2008 is especially crucial because the unadjusted series gives the impression of the acceleration of intra-regional migration in the longer term, while also suggesting a sharp decline around the time of the Great Recession. The reality is that the rate peaked in 1998 and then subsided somewhat, with the impact of recession

in 2008-09 being relatively muted. Indeed, remarkably the rate then was much higher than in the two previous recessions at the start of the 1980s and 1990s and, in fact, the decadal average rate for 2001-11 was the highest of the period at 13.8 per 1000 compared with 13.7 for 1991-2001, 12.5 for 1981-91 and 13.0 for the six years 1975-81.

Is this observation of accelerating intra-regional migration found for all age groups, or is there a ‘student effect’ operating here like for between-region migration? Figure 6 displays the annual rates for the five age groups and does indeed reveal an acceleration in rate for the 16-24s between 1992 and 1996 that in relative terms is not much smaller than that in Figure 3 (though with a much large jump in 1994). Just as for between-region migration, the 16-24 rate then drops away in the 2000s and ends up in 2011 at around the same level as at the start of the study period in the mid 1970s. But there is also evidence of buoyancy in the rates for the 25-44s and 45-64s, which both end up higher than at the start, and it is only for the oldest age group that the rate would appear to be running at a lower level in more recent years.

Figure 6. Rate of migration between areas within regions for years ending June, 1976-2011, by age (Source: see Figure 2)

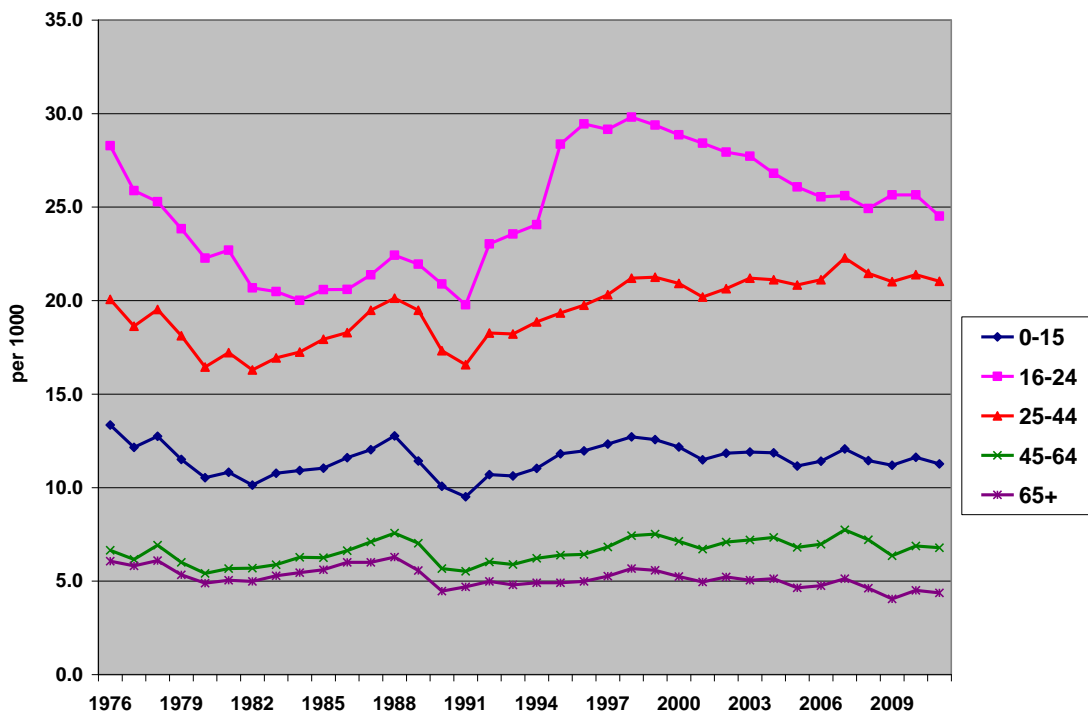
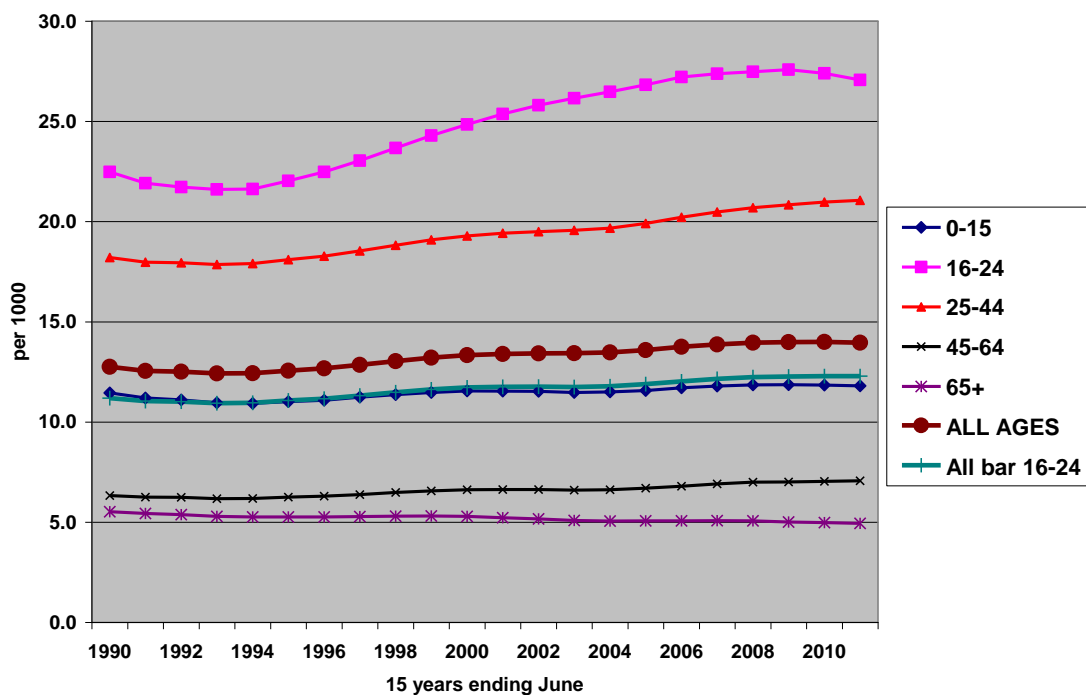


Figure 7 attempts to allow for the effect of the business cycle by showing 15-year running averages for the five age groups, all ages combined and all ages bar the 16-24s. It confirms the generally upward trajectory of the 16-24s, for whom the average rate at the outset (July 1975 to June 1990) was 22.5 per 1000 and at the end (July 1996 to June 2011) was 27.1, an increase of 20.4 per cent. But even excluding the 16-24s the average rate was higher at the end than at the start, with equivalent figures of 11.2 and 12.3 per 1000 and a relative rise of 9.4 per cent. The only age group where the long-term trend declined was for those aged 65 and over, down by 10.5 per cent from an average of 5.5 to 4.9 per 1000 between 1975-90 and 1996-2011. The other three all registered long-term gains, though not as large as for the 16-24s: for 25-44s, up by 15.7 per cent from 18.2 to 21.1 per 1000; for 45-64s, up by 11.7 per cent from 6.3 to 7.1 per 1000; and for 0-15s, up by 3.0 per cent from 11.5 to 11.8 per 1000.

Figure 7. 15-year running averages of migration between areas within regions, by age (Source: see Figure 2)

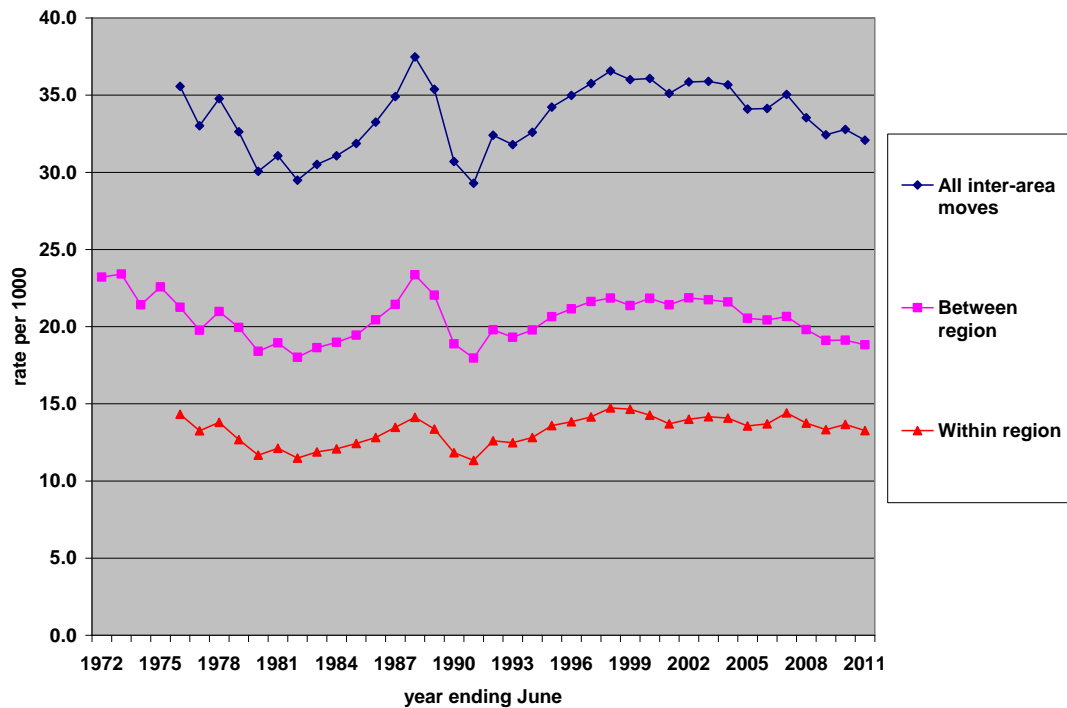


All between-area migration

This third and final section of empirical results examines the two series combined as well as comparing them. Figure 8 shows the full between-region series from June 1971, as well as the within-region and combined series from the start of the sub-

regional data in 1975. The within-region rate is consistently lower than the between-region one, which is due primarily to the former excluding within-area moves but is also affected by having to reduce the number of sub-regional units in order to achieve a consistent geography over time and by the between-region series being swelled by the flows taking place between an under-bounded London and its adjacent regions. As regards their patterns over time, there appears to be a relatively close fit between the two, both experiencing the three recessionary lows, though with the between-region rate being the somewhat more sensitive to these business cycles.

Figure 8. Migration rate, 1971-2011, all ages, for between-region, within-region and all between-area moves



As regards the key question of the long-term trend, Figure 8 does not indicate any strong decline in migration intensity along the lines of that observed for the USA in Figure 1. Instead, the rates for the second half of the study period generally fall within the range of observations found for up to the early 1990s. Certainly the between-region rate in the latest recession was no lower than it had been at the time of the two previous ones. While the extension of this series back to the early 1970s might seem to suggest a longer-term decline from the 1960s, the evidence provided by the Census for then (see above) disproves this, as the 1960s was a decade of accelerating

migration that presumably peaked around 1970. The within-region rate seems to have been generally higher in the second half of the period, but it would probably have been below that of the early 1970s if data had been available for then (or if the series were to be estimated back on the basis of a fixed relationship with the between-region rate).

Before checking on the long-term trend more precisely, however, there is the question of how much this resilience of overall migration rates is the result of the post-1990 increase in higher-education participation. Figure 9 shows the result when the 16-24s are omitted from the rates calculation, this chart running from 1975-76 as this was the first year for which age was recorded in the NHSCR (see above). The omission of the 16-24s does lower the rate for the post-1992 period compared to the trajectory in Figure 8, but the overall conclusion is broadly the same. While the last three years of the between-region rate are now amongst the lowest recorded, the combined rate of inter-area moves for the second half of the study period is consistently within the range found for the first half.

Figure 9. Migration rate, 1971-2011, all ages bar 16-24, for between-region, within-region and all between-area moves

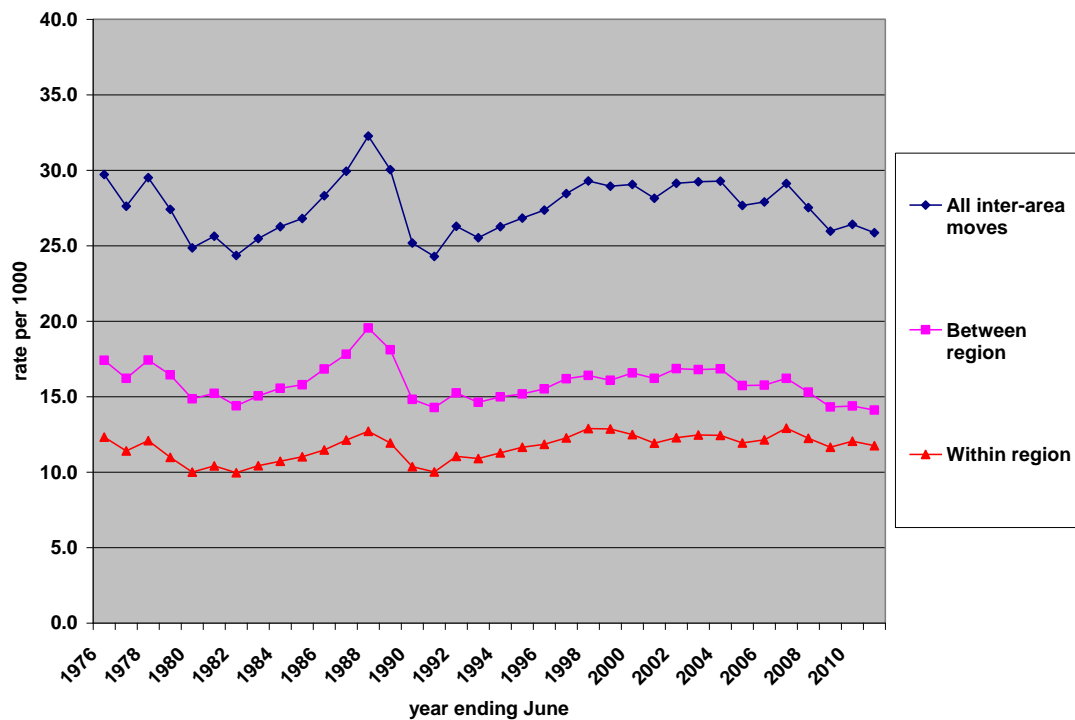


Table 2 undertakes the more precise test by comparing the average annual rates of the first and last 15 years of the period for which the full data is available. On this basis, the overall rate of migration is found to have been higher in the later years than the earlier ones on average, up by 3.7 per cent for between-region moves and by 9.4 per cent for within-region ones, with a 6 per cent increase for the two combined. Omitting the 16-24s (see bottom row) reduces the latter to a 2.1 per cent increase, caused by the between-region rate for the aggregate of the other four age groups switching to a 3.1 per cent decline. Clearly, the record for the 16-24s is very much out of line for between-area migration, with its 39 per cent increase in rate between the two periods, far higher than the next highest increase of just 3.1 per cent for the 25-44s.

Table 2. Comparison of average annual migration rates for 1975-1990 and 1996-2011, by type of move and age

Age group	Between-region moves			Within-region moves			All between-area moves		
	1975-1990	1996-2011	% change	1975-1990	1996-2011	% change	1975-1990	1996-2011	% change
All ages	20.0	20.8	+3.7	12.8	14.0	+9.4	32.8	34.7	+6.0
0-15	16.8	15.3	-9.3	11.5	11.8	+3.0	28.3	27.1	-4.3
16-24	42.8	59.5	+39.1	22.5	27.1	+20.4	65.3	86.6	+32.7
25-44	25.4	26.2	+3.1	18.2	21.1	+15.7	43.6	47.3	+8.4
45-64	9.7	9.8	+0.9	6.3	7.1	+11.7	16.0	16.9	+5.2
65+	9.4	7.0	-25.6	5.5	4.9	-10.5	14.9	11.9	-20.0
All bar 16-24	16.4	15.9	-3.1	11.2	12.3	+9.7	27.6	28.1	+2.1

Note: Rates of between-region moves and within-region moves may not sum exactly to rates of all between-area moves due to rounding.

The picture is rather different for within-region migration, where the 20 per cent increase in rate for the 16-24s is not so far removed from the 16 per cent increase for the 25-44s. This reinforces the conclusion that there is a real ‘student effect’ operating, given that address changing due to the move to university is predominantly between-region. Nevertheless, it also confirms that within-region (but between-area) migration has been generally more buoyant than between-region migration. This conclusion is also supported by the youngest and oldest ages shown, with the average rate for 0-15s decreasing for between-region moves but increasing somewhat for within-region moves and with the rate for those aged 65 and over declining in both cases but by far more for between-region moves. Finally, lest these 15-year averages

are deemed too short to remove the economic-cycle effect completely, it is worth mentioning that checks using 20-year averages were also run (for the slightly overlapping periods 1975-1995 and 1991-2011), with results (not shown here) that are very similar to those in Table 2.

Summary and concluding comments

The aim of the analyses reported above has been to see whether there has been any significant decline in migration rates in England and Wales since the 1970s like that observed in the USA. This has proved a challenging task. In the first place, the change-of-address data available from Population Censuses derives from a question asked just once every ten years about where people were living 12 months before, with the timing of the reference periods occurring at different points in the business cycle. Secondly, the continuous record provided by the NHSCR used for this study counts only between-area moves, so some other source would be needed to complete the picture of address changing. Thirdly and most problematically for this study is the fact that the NHSCR geography has changed rather frequently, rendering invalid the results of any attempt to monitor between-area migration rates that does not allow for this, with the choice of approach here being to adopt the Lowest Common Denominator of areas.

The headline finding from this representation of internal migration for England and Wales is that there has been no long-term decline in the intensity of inter-area migration since the 1970s, clearly unlike the findings of research on the USA described above and the trajectories shown in Figure 1. This is the case for both the rate of between-region migration and also the rate of migration between areas within these regions. As expected, over the four decades covered by the NHSCR dataset there have been fluctuations in both between-region and within-region migration rates that generally parallel the timing of the business cycle, including lower rates during the most recent recession.

At the same time, there are some differences in the patterning of the time series. One is that the amplitude of the fluctuations through economic cycles has been smaller since the early 1990s, which raises the question as to whether this arises from a

change in the nature of the economy compared to before then or from a change in reaction to a given level of economic stimulus. Another difference is that the dip in migration rate associated with the latest recession has been less marked for within-region than between-region migration, with the former running as strongly in recent years as before 1990. A third difference is the between-region rate had already seen a drop as early as 2004/05, i.e. well before the latest recession but coinciding with the upsurge in labour migration from the A8 countries.

All these findings are still supported by the evidence after excluding the 16-24 age group. This step was taken when the age-specific rates showed that the 16-24s' rate underwent a substantial jump in the early 1990s that might have disguised a decline in migration rates for the rest of the population, and then a less marked subsidence after 2000 which will also have fed into the all-age trend. While this test generally confirmed this not to be case, the question remains as to what lies behind this surge in young adult mobility, most notably whether it actually did occur or is a statistical artefact arising from variation in the accuracy and thoroughness with which the residential mobility of this age group has been recorded. While it has been assumed that this pattern is primarily due to changes in the number and migration behaviour of university students, it would be very helpful to have concrete proof of this effect.

In therefore being able to say with confidence that overall inter-area migration rates have not altered substantially over the past four decades, unlike in the USA, it is tempting to conclude that there is nothing to explain. Yet this is far from the case. In the first place, given that many of the reasons for the decline in US rates listed in the review above would seem to apply as much to the UK context as there, why has this decline apparently not occurred in parallel in the UK? Perhaps there are rigidities that have not allowed rates to fall as much as in the USA or other developments which have offset the effects of the factors behind the declining rates. Secondly, using the one population disaggregation that is possible from the NHSCR-based dataset provided by ONS, it has been found that not all age groups (even discounting 16-24s) have followed an identical trajectory, most notably with the marked reduction in rate for the elderly. While the latter may have its roots in an increasing life expectancy that allows people to stay in their family homes for longer, there is clearly scope for the more systematic analysis of age-related variations and indeed of differences between

people classified on other characteristics like health status, income group, economic position and ethnicity. Thirdly, given that several of the factors cited in the US research could be considered to apply even more to shorter-distance residential mobility than the inter-area moves studied in this paper, a strong case can be made for research on all distances of address changing and with a particular focus on the most localised moves.

In conclusion, as mentioned at the outset, this paper set itself the modest, essentially descriptive, task of identifying the long-term trend in the intensity of internal migration in the UK context, prompted by the observations of decline in the USA. While this proved more challenging than originally envisaged, the main issues were resolved, providing a potential basis for some further analysis that could include following Lomax et al's (2014) example of disaggregating inter-area migration flows into key dimensions like north/south and urban/rural. Nevertheless, it is also the case that the main avenues for follow-up research lie beyond the scope of the NHSCR dataset, with its restriction to between-area migration and its very limited information on personal characteristics. What is needed now is the more systematic interrogation of other potentially relevant data sets that might initially be used for triangulating with these NHSCR-based findings and then form the basis for the better understanding of long-term change in the migration behaviour of different sections of the population. One option is a data set that adds value to Population Census data by linking individual people's census records across enumerations, which while by definition being restricted to the identification of 10-year address changes has the great advantage over the NHSCR in covering all distances of such moves. The results of an exploratory analysis of this alternative source are reported in Champion and Shuttleworth (2015).

References

- Adey P 2010, *Mobility*, Routledge, Abingdon, Oxon.
- Bauman Z 2000, *Liquid Modernity*, Polity Press, Cambridge.
- Bell M and Charles-Edwards E 2013, *Cross-national Comparisons of Internal Migration: An Update on Global Patterns and Trends*. Technical Paper No. 2013/1. United Nations Department of Economic and Social Affairs, New York.

- Bell M, Charles-Edwards E, Ueffing P, Stillwell J, Kupiszewski M and Kupiszewska D 2015, Internal migration and development: comparing migration intensities around the world, *Population and Development Review* 41 (1) 33-58.
- Bell M, Charles-Edwards E, Kupiszewska D, Kupiszewski M, Stillwell J and Zhu Y 2015, Internal migration data around the world: assessing contemporary practice, *Population, Space and Place* 21 (1), 1-17.
- Castles S and Millar MJ 2009, *The Age of Migration*, Palgrave Macmillan, Basingstoke, 4th edition.
- Champion T 2005, Population movement within the UK, in Chappell (ed) *Focus on People and Migration*, Palgrave Macmillan, Basingstoke, 91-113.
- Champion T and Shuttleworth I 2015, Are people moving home less? An analysis of address changing in England and Wales, 1971-2011, using the ONS Longitudinal Study, Spatial Economics Research Centre Discussion Paper 177, London School of Economics, London.
- Cooke TJ 2011, It is not just the economy: declining migration and the rise of secular rootedness, *Population, Space and Place* 17 (3), 193-203.
- Cooke TJ 2013, Internal migration in decline, *The Professional Geographer* 65 (4) 664-675.
- Cresswell T 2006, *On the Move: Mobility in the Modern Western World*, Taylor and Francis, London.
- Devis T 1984, Population movements measured by the NHSCR, *Population Trends* 36 18-24.
- Fielding T 2012, *Migration in Britain*, Edward Elgar, Cheltenham.
- Fischer CS 2002, Ever-more rooted Americans, *City & Community* 1 (2), 177-198.
- Frey WH 2009, *The Great American Slowdown: Regional and Metropolitan Dimensions*, Metropolitan Policy Program, Brookings Institution, Washington DC.
- Green AE 1992, Changing labour market processes and internal migration, in Champion T and Fielding T (eds) *Migration Processes and Patterns Volume 1: Research Progress and Prospects*, Belhaven Press, London, 105-118.
- Hannam K, Sheller M and Urry J 2006, Editorial: Mobilities, immobilities and moorings, *Mobilities* 1 (1), 1-22.
- Jaffe E 2012, The mystery of declining mobility, *The Atlantic Cities*, December 17.
- Kaplan G and Schulhofer-Wuhl S 2012a, Interstate migration has fallen less than you think: Consequences of hot desk imputation in the Current Population Survey, *Demography* 49, 1061-1074.
- Kaplan G and Schulhofer-Wuhl S 2012b, *Understanding the Long-Run Decline in Interstate Migration*, National Bureau of Economic Research Working Paper 18507, NBER, Cambridge MA.
- Kaplan G and Schulhofer-Wuhl S 2012c, *Understanding the Long-Run Decline in Interstate Migration*, Federal Reserve Bank of Minneapolis Working Paper 697, Minneapolis.
- Lee ES 1966, A theory of migration, *Demography* 3 47-57.

- 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.
- Lowery A 2013, Why are Americans staying put? *New York Times* December 10.
- Molloy R, Smith CL and Wozniak A 2011, Internal migration in the United States, *Journal of Economic Perspectives* 25 (3) 173-196.
- Molloy R, Smith CL and Wozniak A 2013, *Declining Migration within the US: The Role of the Labor Market*, Federal Reserve Board of Governors, Washington DC.
- ODPM 2002, Development of a Migration Model. Office of the Deputy Prime Minister: London.
- Ogilvie AA 1982, Population migration between the regions of Great Britain, 1971-9, *Regional Studies* 16 (1), 65-73.
- Partridge MD, Rickman DS, Olfert MR and Ali K 2012, Dwindling US internal migration: Evidence of spatial equilibrium or structural shifts in local labor markets? *Regional Science and Urban Economics* 42 (1) 375-388.
- Robins K 2000, Encountering globalization, in Held D and McGrew AG (eds) *The Global Transformation Reader*, Polity Press, Cambridge.
- 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.
- Sheller M and Urry J 2006, The new mobilities paradigm, *Environment and Planning A* 38 80-93.
- Smith D, Finney N, Halfacree K and Walford N (eds) 2015, *Internal Migration: Geographical Perspectives and Processes*, Ashgate, Farnham, Surrey.
- 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, 28-55.
- Urry J 2007, *Mobilities*. Polity: Oxford.
- Wolf DA and Longino CF 2005, Our 'increasingly mobile society'? The curious persistence of a false belief, *The Gerontologist* 45 (1) 5-11.
- Zelinsky W 1971, The hypothesis of the mobility transition, *Geographical Review* 61 (2) 219-249.

Annex 1. Full schedule of NHSCR migration-reporting areas, 1976-2011 (for year ending June), by former Government Office Region

Note: year shown indicates the first time that the change in geography applied in June. LCD = Lowest Common Denominator. & = areas combined.

North East

1976: Gateshead, Newcastle, North Tyneside, South Tyneside, Sunderland, Cleveland, Durham, Northumberland (8)

1999: Gateshead & South Tyneside, Newcastle & North Tyneside, others same except Cleveland renamed Tees (6)

LCD: Gateshead & South Tyneside, Newcastle & North Tyneside, Sunderland, Cleveland/Tees, Durham, Northumberland (6)

North West

1976: Liverpool, Sefton, St Helens & Knowsley, Wirral, Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Wigan, Cheshire, Cumbria, Lancashire (16)

1999: Bury & Rochdale, Wigan & Bolton, West Pennine (=Oldham and Tameside), Cumbria & Lancashire, others same (12)

2001: East Lancashire, Morecambe Bay, North Cheshire, North Cumbria, North West Lancashire & South Cumbria, South Cheshire, South Lancashire, no further change for Greater Manchester and Merseyside (17)

LCD: Liverpool, Sefton, St Helens & Knowsley, Wirral, Bury & Rochdale, Wigan & Bolton, West Pennine, Manchester, Salford, Stockport, Cheshire, Cumbria & Lancashire (12)

Yorkshire & The Humber

1976: Barnsley, Doncaster, Rotherham, Sheffield, Bradford, Calder, Kirklees, Leeds, Wakefield, Humber, North Yorkshire (11)

2001: Calder & Kirklees, East Riding, South Humberside, others same (11 but somewhat different from 1976)

LCD: Barnsley, Doncaster, Rotherham, Sheffield, Bradford, Calder & Kirklees, Leeds, Wakefield, Humber, North Yorkshire (10)

East Midlands

1976: Derbyshire, Leicestershire, Lincolnshire, Northamptonshire, Nottinghamshire (5)

2001: North Derbyshire, South Derbyshire, North Nottinghamshire, Nottingham, plus the other 3 counties (7)

2008: Nottinghamshire reinstated (6)

LCD: Derbyshire, Leicestershire, Lincolnshire, Northamptonshire, Nottinghamshire (5)

West Midlands

1976: Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall, Wolverhampton, Hereford & Worcester, Shropshire, Staffordshire, Warwickshire (11)

2001: Herefordshire, Worcestershire, North Staffs, South Staffs, others same (13)

LCD: Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall, Wolverhampton, Hereford & Worcester, Shropshire, Staffordshire, Warwickshire (11)

Wales

1976: Clwyd, Dyfed, Gwent, Gwynedd, Mid Glamorgan, Powys, South Glamorgan, West Glamorgan (8)

1999: North Wales & Dyfed & Powys, Morgan (=West Glamorgan & part of Mid Glamorgan) & Bro Taf (=South Glamorgan & part of Mid Glamorgan) & Gwent (=Gwent & part of Mid Glamorgan) (2)

2001: North Wales, Dyfed & Powys, Morgan, Bro Taf, (new) Gwent (5)

LCD: North Wales & Dyfed & Powys, Morgan & Bro Taf & (new) Gwent (2)

East of England

1976: Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk, Suffolk (6)

1999: Cambridgeshire & Norfolk, plus the other 4 counties (5)

2000: Cambridgeshire, Norfolk separate again (6)

2001: North Essex, South Essex, East & North Hertfordshire, West Hertfordshire, plus the other 4 counties (8)

2008: Hertfordshire reinstated (7)

LCD: Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk, Suffolk (6, with flows between Cambridgeshire and Norfolk estimated for 1999)

London

1976: Middlesex, Barking & Havering, Bexley & Greenwich, Bromley, Camden & Islington, City & Newham & Tower Hamlets, Croydon, Kensington & Chelsea & City of Westminster, Kingston & Richmond, Lambeth & Southwark & Lewisham, Merton & Sutton & Wandsworth, Redbridge & Waltham Forest (12)

1986: Middlesex separated into Barnet, Brent & Harrow, Ealing & Hammersmith & Hounslow, Enfield & Haringey, Hillingdon, Middlesex Not stated, plus the other 11 (16 real areas, Middlesex Not stated still contained some counts until 1993)

LCD: as for 1976 (12)

South East

1976: Berkshire, Buckinghamshire, East Sussex, Hampshire, Isle of Wight, Kent, Oxfordshire, Surrey, West Sussex (9)

2001: East Kent, West Kent, East Surrey, West Surrey, North & Mid Hampshire, South & East Hampshire, South West Hampshire, plus other 6 counties (13)

2008: back to pre-2001 (9)

LCD: Berkshire, Buckinghamshire, East Sussex, Hampshire, Isle of Wight, Kent, Oxfordshire, Surrey, West Sussex (9)

South West

1976: Avon, Cornwall, Devon, Dorset, Gloucestershire, Somerset, Wiltshire (7)

2001: North & East Devon, South & West Devon, plus 6 other counties (8)

2008: Back to pre-2001 (7)

LCD: Avon, Cornwall, Devon, Dorset, Gloucestershire, Somerset, Wiltshire (7)

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