
PART 1: TOTAL MIGRATION PATTERNS

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A nation's population is redistributed through migration flows and counterflows between its constituent subnational areas, resulting in a geographical pattern of net migration gains or losses which may change from one time period to another. Migration effectiveness is the indicator commonly used to measure net migration as a proportion of gross migration turnover for any territorial unit. This paper explores the effect of net migration in two different countries, Australia and the United Kingdom, using measures of migration effectiveness computed from period-age migration data sets for a system of city regions assembled for four consecutive five-year periods in each country. While the evidence suggests that the overall effectiveness of net migration has declined over the 20-year period in both countries, marked similarities and contrasts are apparent in the spatial patterning of migration that together provide useful analytical insights into the changing space economies of the two countries.

The effects of internal migration in redistributing population between territorial units within a nation are normally measured by net migration balances or rates. While it is argued that the concept of net migration is limited because it is the component gross flows that are of primary importance in understanding migration behaviour, and that net migrants do not actually exist per se (Rogers 1990), net migration does, nevertheless, represent the outcome of the interaction between areas and is often the key variable explaining population change. However, when used in isolation, net migration fails to capture the size of the gross flows which determine its own magnitude. One set of measures that overcome this difficulty by relating net migration directly to its constituent flows is the family of ratios known collectively as the migration effectiveness index (MEI).

As Plane (1984) points out, the MEI has a number of properties which make it superior to the conventional net migration rate when used for the systematic analysis

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of migration patterns over space and time. Because it is calculated using the population of the area of interest as the denominator, the net migration rate is affected by the cumulative population history of that area. In contrast, the effectiveness measure is solely a function of movements to and from an area that occur in a defined period and is therefore more sensitive to temporal shifts and spatial variations in the pattern of migration flows. Thus, it is apparent that migration effectiveness does not measure the same thing as the net migration rate, although the two measures are often closely correlated (Plane 1984; Rogers and Raymer 1998). When used as a systemwide measure, the latter summarizes the extent to which migration is acting to transform the pattern of human habitation, whilst the former indicates the degree of balance or symmetry in the network of migration flows (Plane 1994). Both measures reflect the human response to spatial variations in opportunities and constraints, but migration effectiveness captures the extent of equilibrium or disequilibrium in the flows between geographical areas that constitute the migration system.

In this paper, we use migration effectiveness, whose measurement is specified in more detail in the next section, to provide new insights into the changing patterns of net migration over the 20-year period from 1976 to 1996 in Australia and the United Kingdom (UK), two countries very different not only in geographic area, but also in the size and distribution of their respective populations. A cross-national comparison of internal migration in these circumstances is very challenging. It raises several problems relating to data comparability and some demanding questions about the choice of geographical scale. Despite these difficulties, international comparisons of this type have a number of potential benefits: measures calculated for individual countries become more meaningful when placed in an international context; commonalities and differences help to differentiate unusual findings from those that have more general applicability; cross-national contexts provide a more rigorous test-bed for migration theory; and at a more fundamental level, they also encourage greater analytical rigour in empirical research.

This paper, which emanates from a wider project comparing migration in Australia and in the UK in an age-period-cohort framework (Bell et al. n.d.; Rees et al. forthcoming), focuses on the way net migration and migration effectiveness in the two countries have changed over time. We begin by discussing the concept of migration effectiveness, considering the factors that may influence its change, and outlining the data sets and geographical areas employed in the analysis. This is followed by a brief comparative review of patterns of population redistribution through net migration in the two countries over the past two decades. We then examine trends in migration effectiveness, first based on aggregate systemwide migration flows and subsequently focusing on individual regions and regional types, highlighting cross-national similarities and differences in the observed patterns, levels and trends. The research reported in Part 1 of the paper is confined to the analysis of aggregate migration data: we reserve consideration of age-specific patterns for Part 2.

**Measures of migration effectiveness**

Migration effectiveness can be computed at a number of levels. When first developed (Thomas 1941), it was conceived as the ratio \( MER_i \) of the net migration in area \( i \) to
the sum of its total inflows from all other areas ($D_j$), and outflows to all other areas ($O_j$):

$$MER_i = 100(D_i - O_i)/(D_i + O_i).$$ (1)

It has been used subsequently to indicate the degree to which in-migration and out-migration are non-cancelling in a number of studies of US migration including those by Galle and Williams (1972), Plane (1984), McHugh and Gober (1992), and Gober (1993). In several of these studies and in more recent work on migration in Germany by Kontuly et al. (1997), for example, the index has been referred to as the index of migration efficiency.

In addition to its use as a single area index, it is possible to compute the effectiveness of individual migration streams ($M_{ij}$) and counterstreams ($M_{ji}$) between pairs of origin and destination areas as a ratio:

$$MER_{ij} = 100(M_{ji} - M_{ij})/(M_{ji} + M_{ij}).$$ (2)

Moreover, the area-specific ratio becomes a systemwide index (Shryock and Siegel 1971) when the absolute values of the net migration balances for all areas are summed and divided by the sum of the gross inflows and outflows:

$$MEI = 100\left(\frac{\sum_i|D_i - O_i|}{\sum_i(D_i + O_i)}\right).$$ (3)

By convention, effectiveness ratios and indices are expressed as percentages. In the case of area- or stream-specific ratios, the MER will assume values between −100 and +100, while the use of absolute values constrains the systemwide MEI to bounds between zero and 100. In each case, high (negative or positive) values indicate that net migration is an efficient mechanism for population redistribution, generating a large net effect for the given volume of movement. Conversely, values closer to zero denote that interarea flows are more closely balanced leading to comparatively little redistribution. In the case of the MER, the sign of the ratio is consistent with the direction of the net migration balance.

Migration effectiveness essentially measures the degree of imbalance, or asymmetry, between a pair, set, or system of migration flows and counterflows. Symmetrical flows suggest that migration operates primarily as an exchange process which serves to maintain the settlement system in dynamic equilibrium (Rowland 1978a,b). Significant population exchanges take place because individual areas that perform specific roles within the settlement system (such as cities) attract migrants at certain life course stages or with particular motivations, from other areas. But these flows are often balanced, to a greater or lesser degree, by other migrants drawn in the reverse direction by a different set of needs, motives, opportunities or aspirations. In this situation, migration therefore acts as a mechanism for rejuvenation and renewal of population structures, and restores imbalances brought about by other demographic processes such as ageing and mortality, but may bring about little if any net redistribution of
population (Rowland 1979).

As areas develop, cement and entrench their roles within the space economy over time, aggregate migration effectiveness might be expected to decline. According to classical economic equilibrium models (Hirschman 1958), labour responds to inter-regional variations in economic opportunities, acting in turn to reduce regional disparities and hence dampen further net shifts of population. In the developed economies of the late twentieth century, however, a number of other structural forces and secular trends have come into play, some of which seem likely to further depress migration effectiveness while others will more probably act to increase it. These include the following.

**Demographic factors**

The declining rate of population growth and new household formation has reduced the pressure for new residential development. This has been accompanied, in both the UK and Australia, by the introduction of more stringent planning controls, environmental protection ordinances, and an emphasis on urban renewal and the use of ‘brownfield’ in place of ‘greenfield’ sites for new housing, all of which reduce the need, or opportunity, for interarea migration. Working in the opposite direction is the ageing of the population and the increase in premature retirement. There has been a rapid rise in the number of relatively affluent retirees, freed from the constraints of proximity to a fixed place of work and able to exercise a greater choice of residential environment, whose movements have started new, largely unidirectional, migration streams to amenity-rich locations.

**Economic factors**

Equally important has been the accelerating pace of structural change in the economy which has meant the effective demise of many older industrial towns and the corresponding expansion of new nodes of growth allied to expanding employment in the services sector, leading to major asymmetries in interarea migration. Regional economic initiatives, whether supported by central or local government, and negative equity in housing, may have stemmed but have rarely halted the emergence of new net flows of labour between areas.

**Technological factors**

Less predictable in its effects is the increasing ease of travel and communications. Reductions in the frictional effect of distance have played a key role in the emergence of new industries, such as tourism, and have facilitated counter-urbanization by enabling a significant segment of the population to exercise their preference for a rural or small-town lifestyle. At the same time, long distance commuting and ‘teleworking’ have become a viable alternative for others, thereby eliminating the need for a residential relocation and reducing the development of asymmetric migration flows caused by differential employment growth.

While the net effect of these opposing forces on aggregate, systemwide migration effectiveness is unclear, it is at the level of individual areas that their effects are played
out. Systemwide trends may obscure radical shifts in the impact of demographic, economic and technological change on the symmetry of migration flows to and from individual territorial units and types of area, or between origin-destination pairs. To borrow from the terminology coined by Plane (1984), 'steady-state flows' which involve more or less equal streams and opposing counterstreams of migrants (and hence low migration effectiveness) may be disrupted to 'non-steady states' (and high effectiveness) through shocks induced either by structural forces or localized events. At the same time, it is important to recognize that asymmetric flows between some pairs of areas may be a persistent feature of the migration landscape. Population movements occur among networks of areas which are often related hierarchically in terms of the opportunities they provide (Jarvie 1985). Individual areas may thus gain consistently from some parts of the migration system while losing to others, but remain in dynamic equilibrium and hence display a steady state overall.

In a similar way, the balance between total inflows and outflows may conceal marked variations in the level of migration effectiveness for different subgroups in the population. Young single adults, family groups, and the aged, for example, respond to different mixes of migration-inducing and migration-inhibiting forces, and therefore seem unlikely to display similar patterns of effectiveness behaviour (Jarvie 1989). If migration effectiveness is to be examined, then attention needs to be paid to each of the three measures set out above. Equally important, as a prelude to any cross-national comparisons, is a clear understanding of the nature of the migration data and of the underlying frameworks of geographical areas.

Migration data sets and frameworks of geographical areas

Apart from surveys, there are two major sources of data on internal migration (Nam, Serow and Sly 1990). The first source consists of censuses in which migration is measured as a transition between two points in time; the second source involves registration systems, where migration events are recorded as they occur and published annually or quarterly. The two types of data differ conceptually and in the way they are measured (Rees 1977). In order to compare migration in Australia and the UK over a 20-year period, it has been necessary to extract data from both types of source, to make adjustments to each so as to improve consistency and accuracy, and to build a time series database in which migration flows in each country are classified similarly by age, by time period and by cohort of birth (Bell et al. 1999).

In Australia, the only comprehensive source of migration data is the quinquennial population census which collects information on place of usual residence at the census and five years previously. Origin-destination files containing migration flows between 69 regions with consistent boundaries (Temporal Statistical Divisions or TSDs — see Bell et al. 1999) were acquired from the Australian Bureau of Statistics (ABS) from the 1981, 1986, 1991 and 1996 censuses, giving a consecutive sequence of flows over four five-year periods from 1976-81 to 1991-96. Census data have been used to provide a detailed analysis of internal migration in Australia over each of these periods (Maher and McKay 1986; Bell 1992, 1995; Bell and Hugo forthcoming), and specific problems associated with the 1996 migration data have been discussed by Bell and Stratton (1998).
In the UK, although censuses have been taken on a regular basis, they have been decennial since 1971 rather than quinquennial and the last two, conducted in 1981 and 1991, asked one-year rather than five-year migration questions, providing data only for discrete single-year periods. In order to assemble a continuous time series, it was therefore necessary to use movement data from the National Health Service Central Register (NHSCR), a registration system that records the transfer of NHS patients between Family Health Service Authorities, geographical units equivalent to administrative counties and districts in England. The data were supplied by the Office of National Statistics as quarterly files which were subsequently aggregated into mid-year to mid-year flows and, thereafter, to five-year period totals. The NHSCR data do not give information on intrazonal movements but do provide a consistent time series which has been used in previous research to monitor migration in the UK (Devis 1984; Rosenbaum and Bailey 1991; Stillwell, Rees and Boden 1992; Stillwell 1994).

There are two crucial differences between the transition data from the Australian census and the movement data from the UK’s NHSCR. The first is that the latter capture all migrations that occur within the observation period whereas the former record only a single change of address and exclude any multiple or return moves: hence, the census counts movers, whereas the NHSCR counts moves (Long and Bortlein 1990; Bulusu 1991). The second point of contrast between the two datasets is that they adopt different age-time observation plans. Censuses record age at the end of the observation period whereas population registers record the age at which migration occurred. Transition data from the census therefore represent a period-cohort observation plan (a diamond-shaped parallelogram in the Lexis diagram indicated in Figure 1) while event data from population registers reflect a period-age plan (a square in the Lexis diagram). Age-specific migration data recorded in the two types of dataset are therefore not directly comparable. In order to compare migration in the two systems, it is necessary to disaggregate the period-cohort and period-age spaces into two component parts, referred to as age-period-cohort (APC) spaces in Figure 1, and then to reaggregate the APC components into period-cohort (older and younger) or period-age (earlier and later) spaces, as required. The complex estimation routines required to effect this and also to estimate the relevant populations at risk with which to compute migration intensities are described in detail in Bell et al. (1999). The results of this processing are two equivalent databases of interregional migration flows for the UK and Australia classified by sex, 15 age groups (0-4 to 75+), four five-year periods and 19 birth cohorts (pre-1901 to 1991-96). The analysis reported in this paper uses these data in a period-age framework.

The other problematic dimension associated with cross-national comparison and the construction of the databases is the choice of a framework of geographical units that have some equivalence in two countries that are very dissimilar in aggregate area, population size and settlement pattern. This choice is constrained by the nature of the spatial units to which the original movements are coded, by changes in spatial boundaries over time, and by the need for an origin-destination matrix of manageable size. In this paper, we have adopted a system of ‘city regions’ in each country, of which there are 38 in Australia (Figure 2) and 35 in the UK (Figure 3), each of which is based on a single TSD or FHSA, or aggregations thereof (see Bell et al. 1999; Blake, Bell and
Rees forthcoming). These functional frameworks are designed to provide a manageable set of regions that enable flows to and from different types of region to be distinguished and compared cross-nationally. The regions are based on a set of metropolitan cores and their 'tributary' hinterland areas (rest, near, coast, far and remote), which organize the spatial economic systems in both countries. To overcome the problems of distinguishing small areas on the maps, circular cartograms constructed following Dorling (1996) are used for representation. The size of each circle is representative of its population in 1991 and codes are used to assist in region identification.

There are four comparable types of region in the two countries but each also has a number of distinctive regional types. 'Metro Core' regions are the major metropolitan areas in each country; there are eight of these in Australia and nine in the UK. 'Metro Rest' regions are the surrounding or adjacent areas that have close functional linkages with the cores while 'Near' areas are generally more distant from the cores but may be contiguous when their areas are extensive. In Australia, six 'Coastal' regions are identified with attachments to Sydney and Brisbane, whereas in the UK, 'Coast and Country' regions have been distinguished which are essentially the most non-metropolitan parts of the country. Extra categories of 'Far' and 'Remote' regions are defined for Australia whilst Scotland and Northern Ireland are treated as separate regions in the categorization for the UK.
Figure 2  Australian regions and 1991 population cartograms
Figure 3  UK regions and 1991 population cartograms
The level of interregional migration in Australia and the UK

Previous work on the migration of all persons changing usual residence suggests that during their lifetimes, people in Australia migrate nearly twice as often as people in the UK (Long 1991; Rees et al. forthcoming). The higher migration propensity among Australians is evident from aggregate statistics for our two city-region systems: approximately 14.7 per cent of the Australian population of 16.8 million in 1991 migrated at least once between regions during 1991-96 whilst the number of moves between city regions in the UK recorded by the NHSCR, which includes multiple moves made by the same individual, involved around 12.5 per cent of the 1991 population of 58.4 million. In Australia, the number of transitions increased in each of the four five-year periods from 2.25 million in 1976-81 to 2.49 million in 1991-96 although the percentage increase slowed from 5.5 per cent between 1976-81 and 1981-86 to 1 per cent between 1986-91 and 1991-96. In the UK, the number of moves fluctuated over the four periods, falling 4.2 per cent between 1976-81 and 1981-86, rising by 9.6 per cent between the first and second halves of the 1980s and slowing down again by 1.6 per cent from 1986-91 to 1991-96 when 7.35 million moves were registered.

Regional net migration balances in Australia and the UK

The redistribution of population through internal migration has a number of distinctive features in both countries that can be summarized using histograms of regional net migration arranged in subsets according to region type (Figure 4 for Australia and Figure 5 for the UK). In both countries, net migration patterns in the metro core regions are dominated by significant net losses from the primary cities of Sydney and London in each of the four periods. Average losses from London during the entire 20-year period were nearly 50,000 per year compared with 22,000 per year from Sydney. In the UK, the core regions of the main provincial metropolitan areas — Birmingham, Manchester, Liverpool, Leeds, Sheffield and Newcastle — continued to lose through net migration although their losses declined over time, like those of Melbourne and Brisbane in Australia. Adelaide and Perth also experienced losses in each period but these were marginally higher in the first half of the 1990s than in the second half of the 1980s. The metro core regions of Bristol and Cardiff equate with the former counties of Avon and South Glamorgan respectively whose balances were marginally positive in each of the last three periods like those of Hobart, Canberra and Darwin, although the latter had a negative balance in 1986-91.

In the UK, the regions immediately surrounding the main provincial cores also have negative net migration with losses declining over time in most cases. However, in the South East, the area defined as London Metro Rest gained in net terms in three out of the four periods, losing only in 1986-91. In Australia, regions surrounding the major cores (which generally comprise the postwar suburbs and outer parts of the mainland state capital city SDs) all experienced reduced gains when compared with 1976-81 and, in Sydney in 1986-91 and Melbourne in 1986-91 and 1991-96, balances became negative. Regions categorized as ‘near’ experienced net migration gains in most periods in both countries. In the UK, London Near gained large numbers of net migrants although the volume declined over time as losses from London Metro Core and London Metro Rest reduced, and in Newcastle Near and Cardiff Near, the net
flows have been mostly negative. In Australia, Melbourne Near (defined to include most of central Victoria outside the Melbourne SD) experienced net migration losses in 1991-96 after two periods of increasing gain.

The coastal regions in Australia all have positive balances: indeed, consistent migration gains have been a defining feature of the central coast of eastern Australia
since the mid-1980s. The most rural areas in England and Wales, with the exception of Leeds Coast and Country (Humberside) in 1981-86, have experienced net gains in migration with the three counties of the South West that constitute Bristol Coast and Country having by far the most significant gains. In contrast, the Australian far regions have tended to lose population through net migration, with the exception of Melbourne Far East (East Gippsland, Gippsland and Ovens-Murray) and Brisbane Far (Darling Downs) in the 1980s. Net losses have also been recorded from most of the remote regions of Australia with the exception of Darwin Remote where small gains occurred in the late 1970s and early 1980s. Finally, Scotland managed to reverse its previous negative balance in 1991-96 but Northern Ireland’s net migration loss continued in the 1990s though at a reduced level.

The overall patterns of net migration resulting from exchanges between each of these regions and, expressed in terms of average annual volumes of net migration gain or loss in the first and second halves of the 20-year period, have been mapped using cartograms in Figure 6. In the UK, there is a regional contrast between southern England, which has experienced the largest gains, and the northern regions, where gains are smaller or losses have occurred. The contrast in Australia is between the coastal regions, particularly in the east where growth through net in-migration has taken place, and the regions of the interior where net migration losses have been recorded. These broad regional patterns have been accompanied by similar patterns of
loss from the main metro core regions in both countries.

The net migration gains and losses that we have considered above reflect only a small proportion of the aggregate gross flows between the regions. In the last period, for example, the sum of the absolute net migration balances represented 22 per cent of total migration in Australia and only 12 per cent in the UK.

**Migration effectiveness**

Whilst the previous analysis has revealed how longer-distance migration flows in each country have generated regions of gain and loss, we can use the effectiveness index to establish the efficiency of population redistribution through net migration. High migration effectiveness for the whole system of flows suggests that net migration is an efficient mechanism for redistributing the migrating population within a country whilst low values of the effectiveness index indicate that outflows counterbalance inflows in most regions leading to low levels of redistribution overall. Migration effectiveness is higher in Australia than in the UK for the city region frameworks but in both countries the evidence (Figure 7) suggests that migration has become less influential as a mechanism for population redistribution over time. In fact, the effectiveness index declines by 34 per cent in the UK from 9.2 to 6.0 per cent between the first and last periods and by

*Figure 6* Average annual net migration, Australian and UK regions, 1976-86 and 1986-96

*Figure 7* Aggregate migration effectiveness in Australia and the UK, 1976-96
28 per cent in Australia from 15.5 to 11.1 per cent.

The apparent decline in migration effectiveness in both countries provides empirical evidence to support the theoretical proposition that the demographic, economic and technological drivers underpinning development have operated to increase the symmetry in the migration flows to and from the functional regions. However, the major decline in effectiveness in Australia takes place between 1976-81 and 1981-86 and the index increases between 1981-86 and 1986-91 before falling again in the final period. Given the relative magnitude of the net migration losses from Sydney Metro Core, it is likely that an explanation for changes in the systemwide index in each period is at least partly found in the large fall in net losses from the capital between the first period and the second, followed by increased losses in the third period, before a further reduction in net losses in the final period. We use the first and last of these five-year periods in the analysis which follows.

The higher migration effectiveness in Australia as a whole reflects a more extensive range of region-specific indices than in the UK. The comparison is facilitated by graphing ranked negative and positive indices for the regions in each country and presenting them against one another (Figures 8 and 9). At the extreme of the distribution of Australian regions losing by net migration in 1976-81 (Figure 8), Sydney Metro Core has a value of 31 per cent, whilst in the UK, the extreme negative values in 1976-81 (between 15 and 20 per cent) are found in the metro core regions of Liverpool, Birmingham and London as well as Northern Ireland. At the other end of the spectrum, the efficiency of net migration gain is over 30 per cent for the North Coast of Sydney and the Sunshine and Gold Coasts of Brisbane (Figure 9) whilst the largest positive effectiveness ratios in the UK occur in the most rural areas of London Coast and Country, Bristol Coast and Country and Birmingham Coast and Country, although these latter regions have values less than half the Australian equivalents.

The spatial patterns of migration effectiveness are illustrated in Figure 10 using chloropleth mapping, and the origin-destination flows with the highest pairwise effectiveness scores (where there is a net migration exchange greater than 250 persons) are also plotted as arrows. In Australia, the attraction of the Brisbane coastal regions and Sydney Coast South is a dominant feature of both regional and directional patterns of effectiveness in 1976-81. The UK system is more complex with westward links being most effective away from the rest regions of Liverpool, Birmingham and Manchester and out of Northern Ireland to metro cores and coast and country regions in 1976-81.

However, changes in the effectiveness scores shown in Figures 8-10 indicate that not all regions in either country have followed the general trend of decline. Moreover, whilst the range of values in the UK contracts, in Australia it expands, with Brisbane Remote losing almost 32 per cent of its migration turnover and the Sunshine Coast gaining 35 per cent during 1991-96. The overall decline in Australia shown by the national index has been driven by falls in the effectiveness of migration losses from the major city core regions and declines in the gains by the metro rest and near areas associated with Sydney, Adelaide, Brisbane and Perth. Net migration gains to Darwin Metro Core and to Sydney Coast North have also become less effective in 1991-96. However, net migration has been more effective in Australia for moving people away
from the remote regions attached to Brisbane, Adelaide, Sydney and Perth, and the far regions of Melbourne, Adelaide and Hobart, and in redistributing people to the Brisbane Sunshine and Gold Coast regions and to Perth Near. In four regions, the index has moved from positive to negative between the late 1970s and the early 1990s. Declines in net migration effectiveness in the UK system occur across most regions.
with the exception of Sheffield Coast and Country, where net migration gains become more effective, and Sheffield Metro Rest where net losses are more effective in 1991-96. The major reductions have taken place in Liverpool Metro Core and Northern Ireland where net losses have been reduced and in Liverpool Near and London Coast and Country, where net gains have fallen. Only in Scotland and Leeds Coast and Country has net migration changed sign from negative to positive.

Changes in net migration flows and in migration effectiveness according to type of region are summarized in Table 1. This table provides a rich synthesis of both the simi-
larities and the differences between Australian and UK interregional migration. Here we interpret what the table and the previous analyses suggest about the factors at work. First, there is a close similarity in patterns for three types of zone.

1. Metro Cores lose heavily in both periods, but effectiveness declines over time. Metro Cores are the most densely populated areas in both countries, and the net outflows reflect an emerging preference in both countries for lower-density living. Where industrial restructuring has been fiercest — in Sydney, Melbourne and Adelaide in Australia, and in Liverpool, Birmingham, London and Manchester in the UK —
Table 1  Net migration and effectiveness by type of region, 1976-81 and 1991-96

| Type of region | Australia | | UK | |
|---------------|-----------|---------------------|---------------------|---------------------|---------------------|---------------------|
|               | NM 1000s  | MER %               | NM 1000s  | MER %               | NM 1000s  | MER %               |
| Metro Core    | -283      | -19.5               | -135      | -9.2                | -431      | -12.7               |
| Metro Rest    | 188       | 14.3                | 56        | 4.0                 | -15       | -0.4                |
| Near          | 37        | 7.5                 | 35        | 5.7                 | 343       | 6.9                 |
| Coast         | 109       | 21.1                | 150       | 20.3                | 156       | 10.3                |
| Far           | -27       | -5.5                | -60       | -12.2               | -53       | -8.5                |
| Remote        | -26       | -11.2               | -46       | -18.8               | -        | -                   |

Note:  NM = net migration; MER = migration effectiveness ratio.

net out-migration has been highest. For most Australian metro core regions, especially Sydney, but only for London in the UK to a marked extent (Champion and Congdon 1992), the net migration losses of both periods have been counter-balanced by large net gains of migrants from abroad. The decrease in redistribution represented by declining negative effectiveness in core regions in the two countries can be seen as reflecting a slowing down of the industrial restructuring and inner-city emptying processes. There have been successful efforts in both countries, often through public-private partnerships, to renew the economic base of inner-city zones. Derelict or vacant land near metropolitan centres has the precious attribute of high regional accessibility, which can be exploited anew.

2. Near regions gain in both periods, but effectiveness declines. Near regions take their migration gains from city region metro cores. However, the residential and employment development that has attracted such gains, after probably seven decades of operation, are beginning to reach maturity. The epicentre of growth has moved to more attractive settlements in Coast and Coast and Country regions beyond.

3. Coast (Australia) and Coast and Country (UK) regions gain heavily in both periods but effectiveness declines a little overall. The migration gains of such regions reflect the shift to a services-led economy, to migration for consumption rather than production reasons, particularly among migrants anticipating retirement and retirees themselves, and to the attraction of climate, beaches and scenery. This drive to sun and sea is more pronounced in the Coast regions of Australia, especially Sydney North and the Brisbane Gold and Sunshine Coasts than in their counterparts in the UK (Bristol Coast and Country — the South West peninsula; Birmingham Coast and Country — Mid-Wales; and London Coast and Country — the Norfolk Coast), but the underlying forces are the same.

Differences in pattern are apparent for three types of zone.

1. Metro Rest regions in Australia gain migrants in both periods but effectiveness declines substantially, while the Metro Rest regions in the UK experience net migration losses in both periods and negative effectiveness gets stronger. So, although these region types have different gain-loss positions in the two countries, they experience the same direction of change. The difference in migration
experience for this type of region between Australia and the UK reflects the maturity of settlement in these regions in the two countries. In the UK, this regional type contains old industrial towns experiencing restructuring and a lack of replacement economic activities. In Australia, Metro Rest regions include the postwar metropolitan suburbs and fringe areas, which have more viable local economies and offer new housing opportunities to migrants, although they are themselves losing migrants to the more attractive newer settlement regions of the Coast type.

2. *Far* and *Remote* regions in Australia have no equivalents in the UK. Both types of region experienced increasing net losses between the two periods and an associated rise in effectiveness. Out-migration of young adults from the limited job opportunities available in rural areas and small towns has been a persistent feature of the Australian outback. Since the late 1980s the outflow has accelerated as a result of deteriorating prices for farm produce, farm amalgamation, recurrent drought, the widespread withdrawal of services, the progressive decline of older mining and industrial towns, and the substitution of long-distance commuting in place of permanent settlements to operate new mines (Bell 1995).

3. The *Other* region type in Britain is simply the sum of Scotland and Northern Ireland. In each of these regions, migration systems focused on Glasgow and Belfast respectively are likely to be well developed but unfortunately the data do not enable detailed analysis of migration within Scotland and Northern Ireland. The turnaround experienced between the later 1970s and early 1990s in these macro-regions reflects the end of industrial restructuring, some new industrial development such as foreign capital-supported IT developments, and new resource exploitation such as the onshore support facilities for the offshore oil industry in Scotland.

**Conclusions**

Despite the significant underlying differences in the physical geographies and patterns of human settlement of the two countries, there are clear commonalities in the trends and patterns of net migration and migration effectiveness in Australia and the UK. This paper has shown how the efficiency with which net migration redistributes the population across space declined in both Australia and the UK from the second half of the 1970s to the first half of the 1990s. By the use of migration effectiveness indices that standardize net migration according to the volume of gross migration, it has been possible to undertake a more consistent comparative analysis between countries with different volumes of migration and different levels of net migration. The research has shown that net migration plays a more influential role in population redistribution in Australia than in the UK, with regions in Australia at both the most negative and positive ends of the effectiveness spectrum having higher values than their UK counterparts. Moreover, the changing levels of regional migration effectiveness between 1976-81 and 1991-96 have been less unidirectional in Australia with significant increases in the effectiveness of net losses from several far and remote regions occurring against the overall trend of declining effectiveness. On balance, the evidence demonstrates that the demographic, economic and technological forces considered earlier in this paper have combined to reduce, rather than increase,
migration effectiveness. As anticipated, however, these forces have delivered quite different outcomes and temporal trends in particular types of region.

The systems of city regions we have adopted have not been used previously in either country but, from the evidence presented here, they seem to capture fundamental similarities and differences in the structure of the two space economies. In both countries, the metro core regions play a pivotal role as the hubs of economic activity but it is the amenity-rich near and coastal regions that represent the main focus of internal migration gains. However, while falling migration losses from the cores over the past two decades can be traced to similar processes of slower industrial restructuring, coupled with urban renewal, the effects of this fall in outflows have been manifest somewhat differently in the two countries. In the UK, the impact has been most pronounced in near regions whereas in Australia it was the metro rest regions which absorbed the brunt of the slowdown. Moreover, coastal growth in Australia, particularly in the northeast, has proved more resilient than in the UK where coastal and country regions registered a marked slowdown in gains and effectiveness between the two periods. Similarly, the roles performed by the far and remote regions in the Australian space economy differ radically from those of Scotland and Northern Ireland in the UK context, and these variations are mirrored in quite different migration performance.

These results lend considerable support to the definition and adoption of city regions as a general framework for analysing aggregate flows of interregional migration. They also underline the pervasive nature of the contemporary forces influencing migration: the underlying trends and patterns of redistribution in the UK and Australia are remarkably similar, despite their quite different physical geographies and patterns of settlement. What is now required, however, if the dynamics of these exchanges are to be fully understood, is a more detailed assessment of the way in which different influences affect the migration flows and counterflows of particular groups. As in all studies of migration, demographic variables such as age and sex will inevitably be important in accounting for variations in migration propensities and net migration balances for certain regions or region pairs. Age differentials are likely to be particularly important as Rogers and Castro (1986) demonstrated in their international comparative study in the 1980s. The harmonized databases assembled for this project provide a unique opportunity to pursue this dimension and examine the way in which the intensity and patterns of migration effectiveness vary by age in the two systems of city regions. This age-disaggregated analysis cannot be encompassed here, however, and must be postponed to a subsequent paper.

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References


