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The demographic effects of international migration in Europe

David Coleman*

Abstract International migration is now the dominant factor determining the size, rate of change, and composition of most European countries. Migration is driving quite rapid population growth in some north-western countries, slowing or arresting decline in the South, accelerating decline in the East. Migration is difficult to analyse: the process is complex, the data poor, and the theory unsatisfactory. Its many factors include unpredictable policy change. But some conclusions can be reached. While immigration usually reduces the average age of the recipient populations, it cannot 'solve' population ageing except through very high and exponentially increasing inflows. Already it is changing the face of European countries. According to available projections, the proportion of the population of foreign origin in some European countries will increase from 5–15 per cent of the total today, to 15–30 per cent by mid-century. Such projections depend primarily on the assumptions about the level of international migration.

Key words: immigration, emigration, replacement migration, population growth, population ageing, ethnic change

JEL classification: J11, J61

I. Introduction

International migration to Europe is at its highest peacetime level for centuries, both in absolute numbers and in relation to population size. It is now the dominant factor determining the size, rate of change, and composition of most European populations, and also affects their age-structure. Its demographic impact is further accentuated by the close balance of births and deaths in modern societies. In some countries of western Europe immigration is driving up population growth. In the south it slows or reverses decline. Further east, in some countries emigration, not immigration predominates, and accelerates the reduction of numbers arising from natural decrease. Immigration and emigration co-exist and interact; in some western European countries emigration of citizens has reached levels not seen for decades. All this is new. Until recently migration has correctly been regarded as the 'weak sister' of modern demography; its demographic effects modest at the national level, although often pre-eminent on local populations. In recent historical times, peacetime immigrants in Europe usually

*Department of Social Policy and Social Work, University of Oxford, e-mail: david.coleman@socres.ox.ac.uk
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comprised a relatively small proportion of the total populations in most Western countries, although in the Austro-Hungarian, Russian, and Ottoman empires populations had become more mixed. Instead, the historical experience of most western European countries, and later on southern and eastern ones as well, has been emigration, not immigration. About 54m Europeans are believed to have crossed the Atlantic between 1815 and 1914. With brief exceptions in the 1930s and 1960s the net demographic effect of migration on UK population had been negative since at least the eighteenth century. In western Europe, France is the only major exception to this exodus, which continued for some time even after the Second World War.

This paper evaluates the effects of migration on the population dynamics of European countries, emphasizing the diversity of experience between different countries. It reviews the extent to which international migration can be regarded as a solution to the population ageing, and the prospective decline in numbers, that arises from persistent low levels of fertility. Looking to the future, it explores the prospects for immigration continuing at its current high level and the effects that would have on the composition of the populations concerned.

II. Data and definitions

The new demographic salience of migration clouds our understanding of European demography and obscures its future. Of the three components of demographic change, data on migration are far below the quality of those on birth and death. Of the three, its theory is the least satisfactory, its trend by far the most volatile, and its future by far the most difficult to forecast. It is the only demographic component, at least potentially, under substantial and direct policy influence, which adds to the difficulty of prediction. Even its definition is unsatisfactory. The United Nations definition of an 'international migrant' (United Nations, 1998) is a person who moves to a country other than his or her usual residence for a period of at least a year. That definition is independent of citizenship and in practice relies on intention. Of all countries in Europe, only the UK employs a modified version of it, in the International Passenger Survey (IPS), a small voluntary sample of international travellers whose serious deficiencies have recently been highlighted (House of Commons Treasury Committee, 2008). More generally, an immigrant is regarded as a long-term resident of any country who was born abroad. Most statistics on international migration are generated by the administration of immigration rules unique to each country, by no means comparable. Their slow harmonization has been an uphill struggle. Most continental data are not based on measuring flows in or out (the latter are especially deficient) but on the comparisons of annual registrations of foreign citizens in population registers, or on the difference between annual changes in registered population and the annual balance of births and deaths ('natural change').

Many of the data on stocks are not only deficient but also misleading. In many countries until recently, statistics were published regularly only on the number of resident foreign citizens, not the number of immigrants born in foreign countries. The two are not the same. With rapid naturalization, the number of immigrants (i.e. overseas-born persons, mostly originally of foreign citizenship) can be more than double the number of foreign citizens (Table 1). A depressingly large literature is devoted to the complexities and difficulties of migration data (for example, Salt *et al*., 1994; Lemaître, 2005; Poulain *et al*., 2006; Raymer and Willekens, 2008, chs 1–5).

Table 1: Numbers of foreign citizens and immigrants, enumerated in selected European countries, around 2000

	Immigrants (millions)	Immigrants (% of total population)	Foreigners (millions)	Foreigners (% of total population)	Foreigners (% of immigrants)
Austria	1.0	12.5	0.7	8.8	70.8
Belgium	1.1	10.7	0.8	8.2	77.0
Denmark	0.4	6.8	0.3	4.8	71.6
Finland	0.1	2.5	0.1	1.7	68.3
France	5.9	10.0	3.3	5.6	55.6
Netherlands	1.6	10.1	0.7	4.2	41.3
Portugal	0.7	6.3	0.2	2.2	35.6
Spain	2.2	5.3	1.6	3.8	72.4
Sweden	1.1	12.0	0.5	5.3	44.1
UK	4.9	8.3	2.6	4.4	53.2

Note: Persons of undeclared status excluded.
Source: Dumont and Lemaître (2005, Annex 2, p. 34), except UK citizenship data from Salt (2004, Table 4.1).

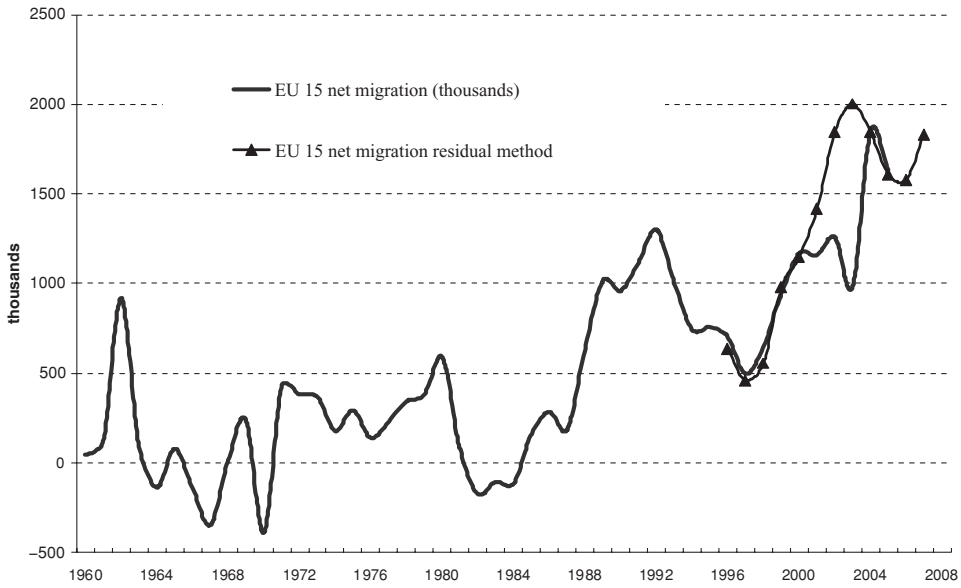
This paper cannot present detailed data on the migration patterns to individual countries or their geographical origin or motivation. The best available data and analyses have been presented in two annual series from the Council of Europe (now terminated; Salt, 2005) and from the OECD (2007), and from the publications and website of Eurostat.

III. Outline statistics on immigration to Europe

In recent years the net demographic effect of international migration has been to add between 1.4 and 1.9m persons per year to the total population of the EU15 countries (Figure 1). The totals therefore represent net movement from outside the EU15 into it. In 2006, international migration increased the EU25 population by 3.1 per thousand compared with a natural increase of 1.0 per thousand (Eurostat, 2007, Table 1). For reasons of space, not of interest, Central and Eastern Europe receives relatively little attention in this paper. Until 1989, the communist regimes in that area prevented large-scale legal migration to the West, and movement even between the Council for Mutual Economic Assistance (CMEA) countries was modest. Before that year the only substantial numbers of emigrants came from former Yugoslavia and to a limited extent from Poland. Since then, those countries have been making up for lost time, as it were, especially since the accession of the A8 countries to the EU in 2004. They have also started to acquire immigrants from the Ukraine and its neighbours in the Former Soviet Union and from low-income countries from outside Europe, the latter mostly illegally or as asylum claimants. Many enter as transit migrants heading West. Although Central and Eastern Europe is a patchwork of traditional minorities (Sellier and Sellier, 2002), immigrant populations from outside Europe are a novelty.

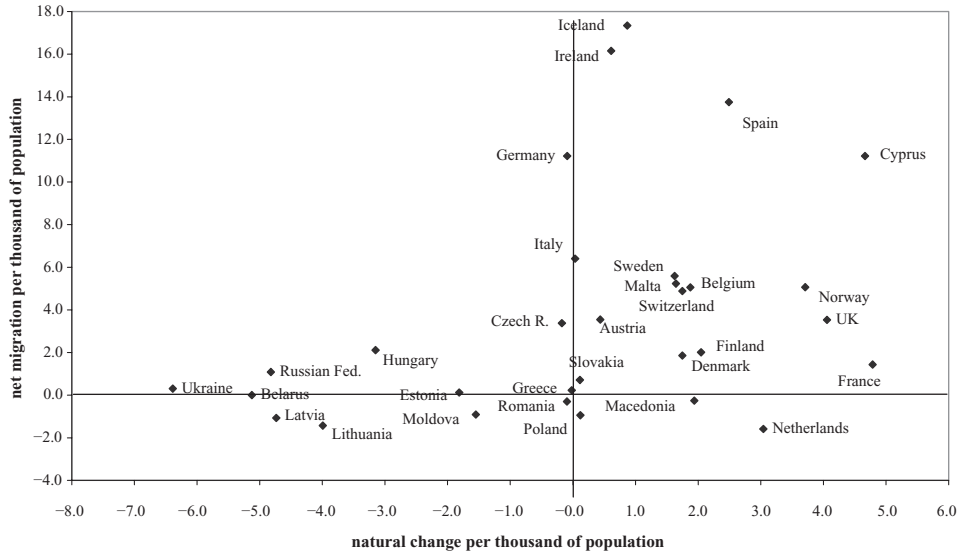
In many western European countries, population increase is driven primarily by international migration, not natural increase (the excess of births over deaths). In some cases immigration is driving population growth to levels not seen for decades. That is even more the case in the USA, Canada, and Australia. In the USA and Australia, fertility remains higher than the EU average. In Central and Eastern Europe, the effects of very low birth rates and high mortality still predominate (Figure 2). Where natural increase has ceased (e.g. in

Figure 1: Net foreign immigration to EU15, 1960–2007 (thousands)



Note: Net migration data based on flows are not available for most countries. The data above are based upon registrations of foreign citizens (smooth line) and estimates of annual population change from population registers, minus estimates of natural increase or decline (line with markers). The difference illustrates some of the difficulties of migration data.
Source: Eurostat, various years: *Statistics in Focus* (to 2005) and website table (to 2007).

Figure 2: Natural change and net migration, Europe 2006



Source: Eurostat.

Germany, Greece, and Italy), net immigration has prevented, or slowed, population decline (Figure 2, and Salt, 2005).

These inflows, generally increasing since the 1950s, have created new populations of immigrant origin in most Western countries and have now begun to do so in Central and Eastern Europe as well.

IV. Components of migration

This paper is concerned with the demographic consequences of migration, not its components or causes. However, the numerically unbalanced nature of recent migration needs some comment, not the least when considering its future level for population projections. Broadly, the post-war novelty of large-scale net migration into many European countries follows parallel global economic and demographic imbalances; the large income gap between the developed countries that were completing their demographic transition to low vital and low growth rates, and poor countries where the excess of birth over death rates generated rapid population growth. The exceptional economic growth from the 1950s to the 1970s promoted labour recruitment from the fringes of Europe and beyond, that latter facilitated by colonial and ex-colonial links. Until recently, Germany took the majority of immigrants to Europe.

After this migration of predominantly male guest-workers and other forms of labour migrants up to the 1970s, however, most migration into developed countries in recent decades has not been formally economic in origin. While labour migration has continued, mostly under the restrictions of work permits from non-EU countries, in recent decades up to three-quarters of net immigration flows have been of dependants, students, asylum-seekers, and spouses, among whom new spouses of both sexes through arranged marriage (as opposed to the re-unification of existing spouses) tend to predominate. Table 2 shows the distribution of migrants to France according to reason for migrating. Persons entering under non-labour provisions may work, of course, but their labour-force participation can be very low, a handicap extending into the second generation (OECD, 2007, pp. 62–95). Depending on national rules, students may stay to work, and in some countries graduates are now encouraged to do so.

To take two extreme examples from OECD data (OECD, 2006), in 2001 the proportion of non-EU immigrants to Sweden entering as labour migrants was 3 per cent (gross inflow), and to Denmark in 2005 1.6 per cent (net inflow). By contrast, labour migration to Germany has been substantial, especially since re-unification; 380,000 entered for work in 2004 out of a total gross inflow of 602,000 foreign citizens (63 per cent). Family migrants and dependants, mostly from outside Europe, are more likely to remain than are labour migrants (Rendall and Ball, 2004). The self-perpetuating networks promoting this chain migration from poor countries have created substantial and increasing transnational populations through the process described as ‘cumulative causation’ by Massey and Zenteno (1999). Most of that was neither inevitable nor planned; it followed more from the development, for humanitarian reasons, of systems of rights for family migration and other immigrant entitlements, in conjunction with the other post-war ‘revolutions’ of information and communication (Freeman, 1994; Martin, 1995, p. 222).

The constant ebb and flow of labour migration specifically for jobs within the European Union has generally not been demographically important in terms of net contributions to the

Table 2: France 2005: immigration (gross inflow) according to reason for admission (%)

Group of nationalities	All	Minor	Student	Worker	Family	Inactive	Refugee	Other	Number	% from each nationality
EEA except A10	100	8	2	34	8	48	0	0	40,000	19
A10	100	7	18	38	23	5	0	9	2,876	1
All EEA	100	8	3	34	10	46	0	1	42,876	21
Turkey, Switzerland	100	12	15	11	39	2	18	3	24,404	12
Maghreb	100	10	14	2	65	3	1	6	59,853	29
French W. Africa	100	5	24	1	49	9	8	4	26,843	13
Other Africa	100	7	11	2	49	12	21	8	8,613	4
Total Africa	100	8	17	1	58	5	5	6	95,309	46
Indo-China	100	4	44	5	42	1	1	3	2,485	1
Other Asia	100	6	46	6	22	2	11	8	26,789	13
Total Asia	100	5	46	6	24	2	10	7	29,274	14
North America	100	6	40	14	18	0	0	22	5,924	3
Other America	100	6	40	5	36	3	4	7	9,017	4
Total Americas	100	6	40	9	29	2	2	13	14,941	7
Other countries	100	5	28	18	26	2	6	17	756	<1
All non-Europe	100	8	24	4	46	4	7	7	164,685	79
Grand total	**100**	**8**	**19**	**11**	**39**	**13**	**6**	**5**	**207,561**	**100**

Note: 'Inactive' is retired and other economically inactive.
Source: INED, 'Statistiques sur la flux d'immigration', available at http://statistiques_flux_immigration.site.ined.fr/fr/admissions/

population. Until 2004, these flows had usually been relatively numerically balanced. The removal of internal barriers to movement have not ironed out persistent regional disparities in labour shortage and surplus (Rees and Kupiszewski, 1999). But until the A8 accession, free labour movement was not conceded until new member states had approached the same order of economic performance as the established members.

The massive recent inflow of young people from Eastern Europe to the UK and a few other Western European countries is a recent major exception to the generalizations above (a cumulative total of 766,000 registrations have been approved up to December 2007 (Home Office, 2008)—a gross inflow figure). The economic and other criteria for entry of the A8 countries to the EU were set considerably lower than those imposed on the southern European countries in the 1980s. The UK government chose not to adopt the precautionary delay on free movement of labour after A8 accession that was imposed by the other major EU economies, in the belief that the net inflow to the UK would be of the order of 13,000. As the Polish and UK economies are now moving in opposite directions it may be that the flow will do likewise; return migration appears to be accelerating. There will be further inflows of dependants; but probably not on the same scale as from the low-income countries. Compared with non-European countries, economic and cultural disparities are modest. Except for gypsies and a few other minorities, Central and Eastern European societies are not strongly characterized by closed communities based on extended household, kin obligations, and arranged marriage that provide the networks that facilitate chain migration (a continuous migration process based on family and other networks linking origins and destinations often on a highly localized geographical pattern (see Mayhew, 2004). Its self-perpetuating tendency has been described as a kind of 'cumulative causation' (Massey and Zenteno, 1999). For these reasons, future migration from A8 countries, both for labour and non-labour purposes, may be modest.

V. Evaluating the demographic effects of post-war migration up to the present

How are we to evaluate the effect of past migration, in and out, on the size and structure of a population, taking into consideration birth and death rates? A projection of the present made from the past, omitting immigration and emigration with appropriate adjustment to vital rates, shows the effect of migration over that time on current population size and structure (Le Bras, 1991). As an example, to determine the effect of migration on the UK population from 1951 to 2001, the mid-year UK population estimate for 1951 was projected forwards without migration and compared with the actual outturn (by Compton, in Coleman *et al*., 2002). With adjustment for higher immigrant fertility, the net effect of migration from 1951 added an additional 2.89m people to the UK population over the period—that is, accounting for 30 per cent of total population growth. The overall net impact of migration was minor up to 1981: negative between 1951 and 1961, positive between 1961 and 1971, and again negative between 1971 and 1981, consistent with the history of migration. From that date onwards it was strongly positive.

Moving forward from the 2001 census to mid-2006, the natural-change projection from 2001 would lead to a UK population of 59.5m by 2006, compared with the Office for National Statistics (ONS) mid-2006 population estimate of 60.6m—a difference of 1.1m, or a net annual increment of about 200,000 per year, arising from the direct and indirect effects of migration. That estimate is approximate only, given the uncertainly of the 2001 population census total (and all other official estimates of UK population at present). Also any effect of the absence of migration on fertility from 2001 to 2006 has not been taken into account in the natural-change projection.

These calculations for other populations can reveal more significant contributions to population growth. France has sent few emigrants abroad since the nineteenth century. Instead, perennial concerns over population encouraged a favourable approach to immigration. Partly as a consequence, the contribution of immigration to French twentieth century population growth has been considerable: in 1986, while 3.5m of the French population were themselves born abroad, without the net immigration of the previous century the national population of 55m would have been 10–11m smaller. In 1986 about 20 per cent of residents born in France had at least one parent or grand-parent born abroad (Tribalat *et al*., 1991).

VI. The demographic effects of migration on European countries projected to 2055

Figure 1 showed the substantial, often predominant contribution around the year 2005 made by international migration to the population dynamics of European countries. With the residual effects of population momentum running out of steam (Lutz *et al*., 2003), the contribution of migration to population will increase further. The contrast between the projected populations of selected European countries assuming current migration levels, and without migration in or out, is shown in Table 3. These scenarios assume a long-term convergence in European demographic rates by 2150. At 2055, however, the cut-off point in the table above, migration and fertility are still assumed to be similar to the various national levels in 2008, with a progressive improvement in survival.

Table 3: European countries projected to 2055, with and without migration, Eurostat 2008 convergence scenario (selected western and southern European countries)

		Population (millions)		Percentage change	
	2008	Migration 2055	No migration 2055	Migration 2055	No migration 2055
France	61.9	71.4	65.2	15.5	5.3
UK	61.3	75.6	61.4	23.5	0.3
Netherlands	16.4	16.7	15.5	2.0	−5.5
Spain	45.3	52.7	38.6	16.4	−14.8
Italy	59.5	60.4	46.2	1.5	−22.4
Germany	82.2	72.6	61.1	−11.6	−25.7
Scandinavia					
Norway	4.7	6.0	5.0	26.0	4.7
Sweden	9.2	10.8	9.0	17.4	−2.3
Denmark	5.5	5.9	5.3	7.8	−3.5
Finland	5.3	5.4	5.0	2.3	−5.5
Selected central and eastern European countries					
Poland	38.1	32.2	31.6	−15.4	−17.1
Romania	21.4	17.6	17.2	−17.9	−19.9
Czech Rep.	10.3	9.7	8.2	−6.0	−20.4
Slovenia	2.0	1.8	1.6	−9.5	−22.0
Hungary	10.0	8.9	7.8	−11.4	−22.5
Latvia	2.3	1.7	1.7	−23.0	−23.4
Bulgaria	7.6	5.7	5.6	−25.3	−27.0

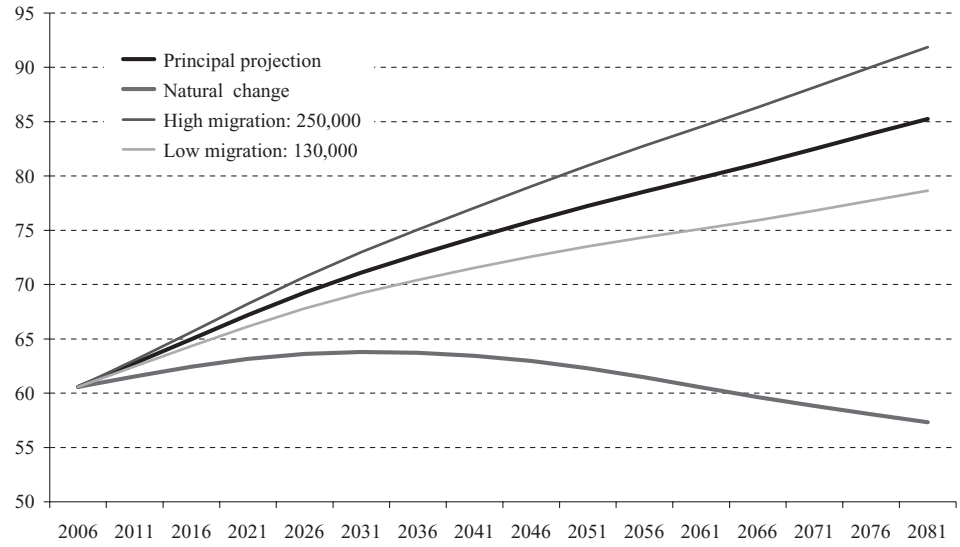
Note: Ranked by order of population decline in the absence of migration.

On these assumptions, without migration in or out, only a few countries are expected to maintain, or to increase, their population size by 2055 compared with 2008. These include France, the UK, and Norway, with the rest of Scandinavia and the Netherlands showing only a small percentage decline. With migration, they would grow by up to 26 per cent. These increases, mostly driven by immigration, contrast with the almost stationary future numbers projected in the 1980s. The western and southern countries all decline substantially without the projected migration. Germany, alone, is projected to decline even with migration. Its long-term low fertility—the last generation of Germans to replace themselves was born around 1933—has given profound negative momentum to the age-structure. Further east, a few of the more prosperous Central European countries, for example the Czech Republic and Slovenia, have attracted immigration at a level expected to moderate what would otherwise be a large projected decline in numbers. In most of the others, emigration and immigration are more or less balanced, so the imagined absence of all migration makes little difference to projected population size. On these assumptions, countries such as Poland, Latvia, Bulgaria, and Romania will lose between 15 and 27 per cent of their population by 2055 with or without migration, thanks to their low birth rates.

VII. The contribution of immigration to current and projected population growth in the UK

These effects cannot be discussed in detail in respect of all countries. The UK is chosen as an example because it is most familiar. In net terms, net international migration to the UK

Figure 3: UK population projected to 2081, GAD principal projection, natural change, and high- and low-migration variants (millions)



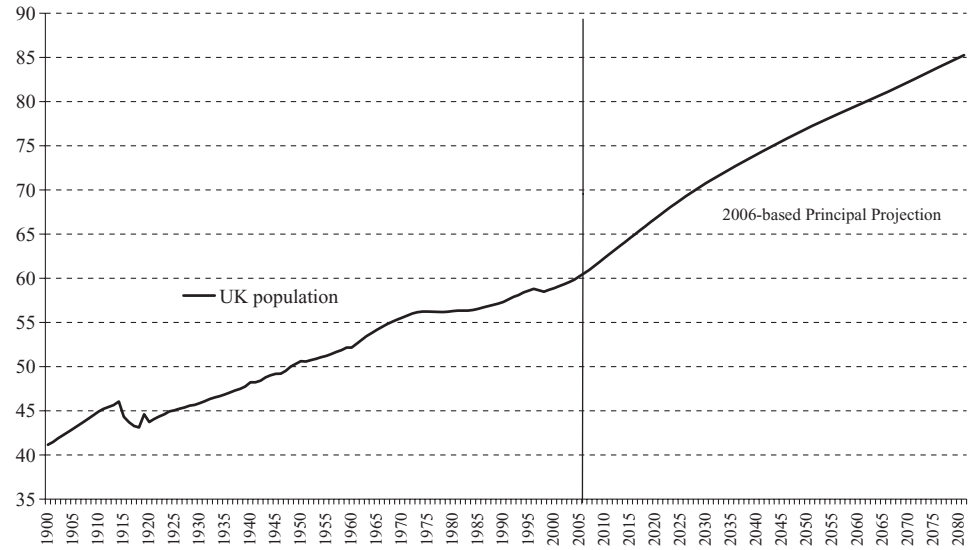
Source: GAD, 2007.

increased the population by 191,000 or 3.2 per thousand in 2006 according to ONS figures. Eurostat (2007, Table 1) gives a slightly lower figure of 2.6 per thousand—about the same as Italy and France, in relation to population, and slightly less than the EU25 average of 3.1 per thousand. A sharp increase in the component of annual population growth due to migration is evident from the late 1990s onward, peaking around 65 per cent in the early 2000s.

Looking to the future, most projected UK population growth is expected to arise from the direct and indirect effects of international migration. In the most recent official population projections based on 2006, the 'principal projection' assumes a progressive improvement in survival of about 2 per cent per year, declining to 1 per cent per year after 2031, a constant total fertility of 1.84, and a constant annual net immigration of 190,000 (GAD, 2007). The latter two figures are those observed in 2006. In these 2006-based projections the Government Actuary's Department (GAD) has abandoned its much criticized previous policy of assuming future long-term migration trends to be substantially lower than the actual levels of the most recent years. These figures make no allowance for illegal immigration or illegal overstaying. There are no official estimates of illegal inflows, but the stock of illegally resident persons in 2001 has been estimated indirectly to be 430,000. That can only be regarded an order of magnitude figure in the absence of any direct evidence (Pinkerton *et al*., 2004; Woodbridge, 2005).

Immigration at the current rate would produce startling increases in the total population size of the United Kingdom (Figure 3). According to the principal projection, UK population would increase from just over 60m in 2006 to 69m by 2026, 77m by 2051, and 84m by 2081, growing at 0.71 per cent per annum between 2006 and 2011 (about the current rate), and still by 0.33 per cent at the end of the projection in 2081. The former rate, not seen in the UK since the 1960s, is about the same as that of some middle-income countries, such as Thailand.

Figure 4: UK population 1900–2081 (millions), actual and projected



Source: ONS, GAD.

Table 4: GAD/ONS projections of the UK population, 2006-based (millions)

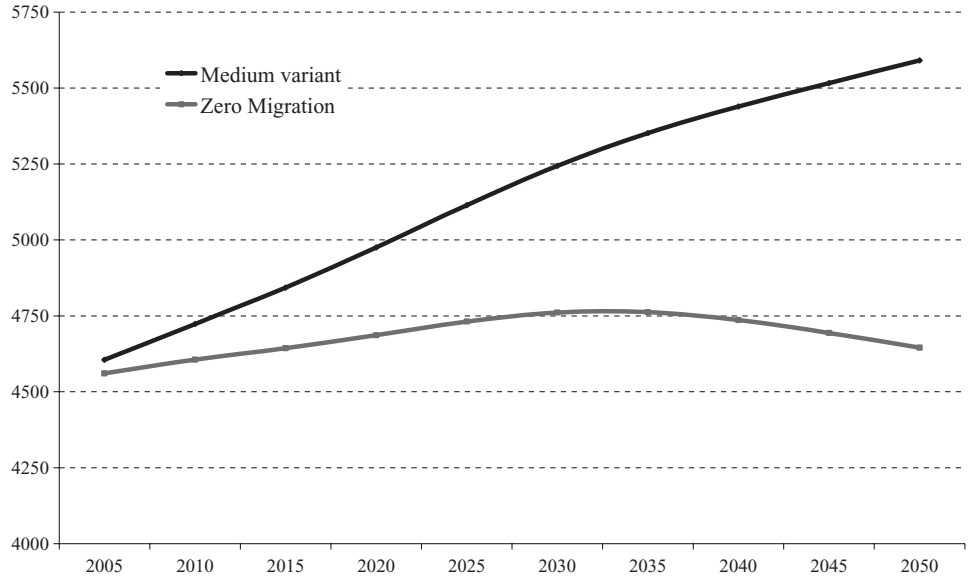
Year	Principal projection	Natural change	Difference (millions)	Population increase from 2006 (millions)		Percentage of increase in PP owing to migration
				With migration	Without migration	
2006	60.6	60.6	0.0	0.0	0.0	—
2026	69.3	63.6	5.6	8.7	3.0	65.1
2031	71.1	63.8	7.3	10.5	3.2	69.4
2051	77.3	62.3	15.0	16.7	1.7	89.8
2081	85.3	57.3	27.9	24.7	−3.3	(all)

Source: Data from GAD website derived from a comparison between the principal projection (PP) and the 'natural change' projection. In the latter, no migration into or out of the country is assumed.

In 1969 the UK population was projected to be 66m by the year 2000, driven by the then relatively high birth rate. Whether the current projection, driven now by immigration, will prove to be as erroneous remains to be seen. UK population growth was levelling out by the late 1970s, when fertility had declined to below the replacement level and net migration was negative. It has resumed an upward growth (Figure 4) owing primarily to net international migration and, towards the end of the projection period, entirely due to it (Table 4) according to GAD assumptions.

With migration at the assumed level, 15m people would be added to the national total by 2051 and 28m by 2081. Without migration, a further 3.2m people would be added to a population which would peak in around 2031. That growth arises from residual demographic momentum, the relatively elevated though still sub-replacement total fertility of 1.84, and to the assumed improvement in survival. GAD provides two alternative migration assumptions

Figure 5: Norway, 2005–50: population projections, medium variant and zero migration (thousands)



Source: Statistics Norway, 2004.

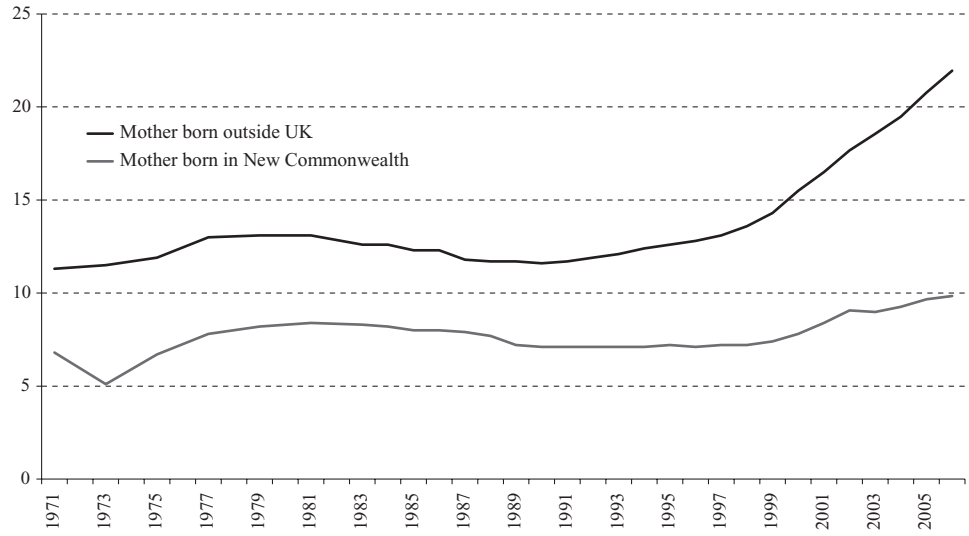
of plus or minus 60,000. The 'high' assumption of 250,000 would add another 20m (33 per cent) to UK population by mid-century and take it to 92m by 2081, an increase of 50 per cent. That would rival the projected rate of increase of the US population, currently the fastest growing of all major industrial countries. In fact, net immigration in 2007 was 237,000.

Other northern European populations face similar levels of population growth, primarily as a result of net immigration. Norway is one example (Figure 5). As with the UK, residual natural increase without migration would keep the population above its present level until about 2035. With immigration at the current and forecast levels, 20 per cent population growth is expected by mid-century.

VIII. The indirect demographic effects of migration

When evaluating the demographic effects of international migration on populations, it is necessary to include both the migrants themselves and their descendants in the country to which they have moved. Usually, as in the GAD projections noted above, it is assumed that the age-specific fertility rates of the immigrant populations are the same as those of the native population (their crude birth rate per thousand population is higher because immigrant populations tend to be more youthful). However, if the age-specific birth and death rates of the immigrant populations are different from those of the indigenous population, then the vital rates of the aggregate population will be altered commensurate with the volume of migration. Although important from a welfare point of view, differences in death rates are only of slight demographic significance, especially as most immigrant populations in Europe are concentrated at ages where death rates are low. Immigrants from non-Western countries

Figure 6: England and Wales, percentage of births to immigrant mothers, 1971–2007



Source: ONS Series FMI, Table 9.1 (various years).

tend to acquire survival patterns in line with local hygienic conditions and health services. In fact many immigrant populations enjoy better health and longer life than the natives (e.g. Chinese in England and Wales, Moroccans in France), others are less fortunate (e.g. Africans in England and Wales, second-generation Pakistanis in Norway) (Courbage and Khlat, 1996; Østby, 2002; Wild *et al*., 2007). In the past, migration (for example of Europeans to the Americas) provoked major population crashes by introducing new diseases (McNeill, 1977). Migration to or in Europe has had no such effects in modern times, with the possible exception of the great influenza pandemic of 1918–19 (Langford, 2005).

Turning to the effects upon the birth rate, immigration has tended to enhance overall fertility. The total fertility of many countries in Western Europe is elevated by about 0.1 or more thanks to the higher average fertility of immigrants. In this there is much diversity. Immigrants from Pakistan, Bangladesh, Turkey, Morocco, Tunisia and sub-Saharan Africa have elevated total fertility. Others—most Europeans, Indians, and, especially, Chinese—have the same or lower fertility rates compared with the indigenous population (Sobotka, 2008*a*; Westoff and Frejka, 2007).

Increases in immigration can therefore increase birth rates. For example, from 2001 to 2006, total fertility in England and Wales increased from 1.63 to 1.86, and births from 594,634 to 669,601. Part of this increase is due to recuperation of fertility as older women produce in later life some of the births that were postponed earlier. However, 65 per cent of that increase (74,967) is attributable to the increase in births to immigrant mothers (49,051). Births to immigrants comprise a growing proportion of the total in many European countries. Relatively constant from the 1960s up to the mid-1990s in England and Wales at about 12 per cent, the proportion has since grown to 24 per cent (Figure 6), about the same as in France and a number of other countries. In the past, a high proportion of such births were to mothers born in the New Commonwealth, but since the mid-1990s the number of births to mothers born elsewhere has increased rapidly.

Note, however, that the fertility of immigrant groups can be inflated by the distortion of the timing of births associated with the migration process itself (Toulemon, 2004).

IX. Migration and population reproduction

Typically, in low-mortality populations a total fertility of about 2.04 is regarded as the 'replacement level', that is, a level sufficient to replace the population in the long run, ignoring migration. This way of looking at population replacement, however, is beginning to look rather inadequate, given the powerful effect of migration upon rates of population change and population composition. Accordingly, demographers have proposed new models of population replacement that take into account fertility, mortality, and migration in a more equal trinity than hitherto (Calot and Sardon, 2001; Smallwood and Chamberlain, 2005; Ediev *et al*., 2007; Preston and Wang, 2007; Sobotka, 2008*b*). According to Ediev *et al*., a comprehensive index of population replacement should take into account the effective contribution from net immigration to the size of each native birth cohort, and the age-structure and the fertility contributions of the original population and of the net immigrant population. Estimates of total fertility of the population combined with the contribution of immigration give the level of replacement. Using Eurostat 2004-based projections which underestimate some levels of net immigration and total fertility, the combined replacement of 12 European countries is raised above two, including Austria, the Netherlands, Switzerland, and Spain. The recent recognition, through amnesty of illegal entrants, of very high levels of immigration into Spain (over 600,000 per year net) has turned around forecasts of the population future of that country, from former assumptions of decline to a new level of demographic exuberance matched only by the USA among the larger countries (see Figure 2). Emigration, of course, can reduce the effective reproduction of other countries, contributing to the pace of their population decline. Emigrants (under those circumstances) are mostly of reproductive age. Latvia, Lithuania, Bulgaria, Romania, Poland, and Slovakia are examples of such countries.

X. Emigration

Emigration inevitably reduces the size of the populations which the emigrants leave behind, or at least moderates population growth that otherwise would have been greater. Movement away from particular regions or cities within countries (correctly entitled 'out-migration' not emigration) is a familiar pattern in modern and recent societies: from remote or depressed rural areas, and from former industrial cities that have lost much of their original industrial *raison d'être*, such as Liège, Lille, and Liverpool. Almost all European countries were 'countries of emigration' until recent times, notably those on the Atlantic seaboard such as the UK, Ireland, and Scandinavia, with the important exception of France (Baines, 1991). Except in the case of Ireland (not then a 'country'), emigration did not then lead to a decline in national population. Apart from in east Germany, national population decline arising from a combination of low fertility and net emigration has only emerged since the 1990s, in post-communist eastern Europe (Figure 2).

Immigration and emigration can interact with each other, and with rates of birth and death. According to the theory of 'change and response' of Kingsley Davis (1963), a number of

responses are possible if population becomes excessive for its subsistence,. If one factor adjusts, the other two may remain unchanged. Death rates may rise, leaving migration and fertility constant. Increased emigration may permit birth and death rates to remain unchanged. The Netherlands provides a modern example where immigration and emigration appear to be connected, through population pressure and changes in population composition. There, immigration has taken the foreign-origin population (the first generation of immigrants, and their children in the second generation) to 16 per cent of the total. Emigration of Dutch citizens has risen to high levels (from 82,200 in 1995 to 132,500 in 2006), both to neighbouring European countries and to more remote destinations, such as Australia. One of the main reasons cited by those leaving is the loss of amenity from the increasing density of population and related changes in society (van Dalen and Henkens, 2007). In the UK net emigration of UK citizens rose to 126,000 in 2006, the highest since 1969. This outflow is in parallel with a substantial increase in immigration, mostly of non-citizens, but no study attempts to relate the two processes. Emigration of citizens is on the increase elsewhere, for example from Germany (Sauer and Ette, 2007) and even France. About 113,000 French citizens resided in the UK in 2006 compared with 56,000 in 1995/6 (Salt, 2006, Table 4.1, and earlier), a much larger increase than seen from other EU countries. In that case, however, the open labour market and more relaxed tax regime of the UK is usually cited as the attraction, and the relatively high youth unemployment in France itself.

XI. Forecasting immigration and its future demographic consequences

The population projections from Eurostat presented in Table 3 assumed the continuation of high rates of immigration. Projections from national statistical offices of the countries concerned are mostly similar. Are these assumptions, and their population consequences, at all plausible? The future level of international migration is the most difficult component of population projection. Population momentum, and the connection between rates of birth and death and the structure of the existing population, give some stability to forecasts of vital rates. That is lacking in respect of migration. The underlying processes are even less well understood than those determining fertility trends. They are ill defined, badly measured, and heterogeneous. Migration streams enter from a large number of different countries and for a variety of different reasons, none of them necessarily correlated with any of the others. That means that it is difficult to specify one theory or model (Massey and Zenteno, 1999; Howe and Jackson, 2005). The economic and political driving factors involved in both sending and receiving countries can only be forecast for a very short time into the future.

It is widely assumed that immigration into Western Europe will continue at a high level. Employers favour labour migration, and pressure groups are generally supportive even when electorates are not. Population ageing and the end of population growth in some countries is claimed to underwrite a growing future demand for labour. Population growth in source countries is an obvious driving force (Mitchell and Pain, 2003), with the forecast addition of a further 3 billion to the world's poor populations by mid-century. Global warming, now expected to make itself felt within the time-horizon of demographic projections, may drive emigration. As immigrant-origin populations grow, migration through arranged marriages and the inflow of dependants has also grown (Lievens, 1999; Lesthaeghe, 2000). The political

importance of growing migrant populations may make restrictive immigration policies more difficult to introduce. However, migration can go down as well as up. Asylum-seeking has declined since the early 2000s. Policy changes in the Netherlands and in Denmark have accelerated the removal of failed asylum-seekers and substantially restricted migration for purposes of marriage. The Netherlands actually lost 19,000 people through net migration in 2005.

One partially unifying process is the extent to which government policy is restrictive or permissive. All governments have policies on migration which can be effective (in either direction). However, given the pressure of population and poverty abroad, and influences from diverse sources—employers, migrant groups, and human rights considerations at home—relaxing migration controls is both easier and more effective than tightening them (Freeman, 1994). The effect of policies has been underestimated (Hollifield, 2000; Hatton, 2005) in analyses dominated by economic modelling. Immigration policies can switch radically as the political pendulum removes one party from government office and installs another, even when immigration has not been an electoral issue. For example, the Labour government of 1997 instituted an important change of policy from 2000 to liberalize migration. While the benefits of migration were claimed in pre-election publications from the Institute for Public Policy Research (IPPR), the most influential Labour-leaning think tank (e.g. Spencer, 1994), the issue was effectively absent from the election campaign and from the respective manifestos. Similar swings in policy have followed election outcomes in the Netherlands, Denmark, France, and Germany, although in those cases migration was a salient issue in the campaigns. Political changes in sending countries also add to the statistical noise in migration patterns, especially when new repressive regimes provoke asylum-seeking.

The difficulty of projecting migration helps to explain why almost all official projections assume (in their central variant) that long-term migration will remain constant at about the current level. Although that is certain to be wrong, there seems to be little rational basis for choosing any alternative path. At least the assumption of constant current levels demonstrates the demographic implications of the continuation of those levels and any policy that sustains them. There is little consensus among 'experts'. Demographers outside the ONS are invited to suggest future levels of demographic rates, for future official projections. The average of the experts' assessment of net migration in 2030 was 199,000, slightly higher than the GAD 190,000. But the estimates ranged between 100,000 and 250,000 (Shaw, 2008). Efforts should concentrate on projecting the separate and often unconnected streams that constitute overall migration. Insofar as they have been tested, disaggregated behavioural forecasts of migration (predicting the present from the past) are better than atheoretical autoregressive models (Mitchell and Pain, 2003). The uncertainties of future migration suggest a need for probabilistic forecasts. These incorporate estimates of uncertainty and do not force projections into one track only, allowing them, instead, to wander between trajectories on pre-determined limits (Lutz *et al*., 1999). Some studies have focused specifically on migration (Wilson and Bell, 2004).

XII. Impacts on population age structure and the potential support ratio

Immigration affects the age-distribution of population. Differential fertility or mortality adds to those effects. Usually, immigrants are young adults and tend therefore to expand

the population in those age groups and reduce the average age. There are exceptions. The migration of retired people from the UK to Spain has a reverse effect, although minor. Retired former guest-workers returning to Portugal have had an ageing effect on that country.

Population ageing competes with global warming as a major European pre-occupation (European Commission, 2005). Population ageing follows inevitably the achievement of low birth and death rates over the last two centuries. Immigration tends to counteract population ageing insofar as the mean age of immigrants to modern Europe is usually younger than that of the receiving societies.

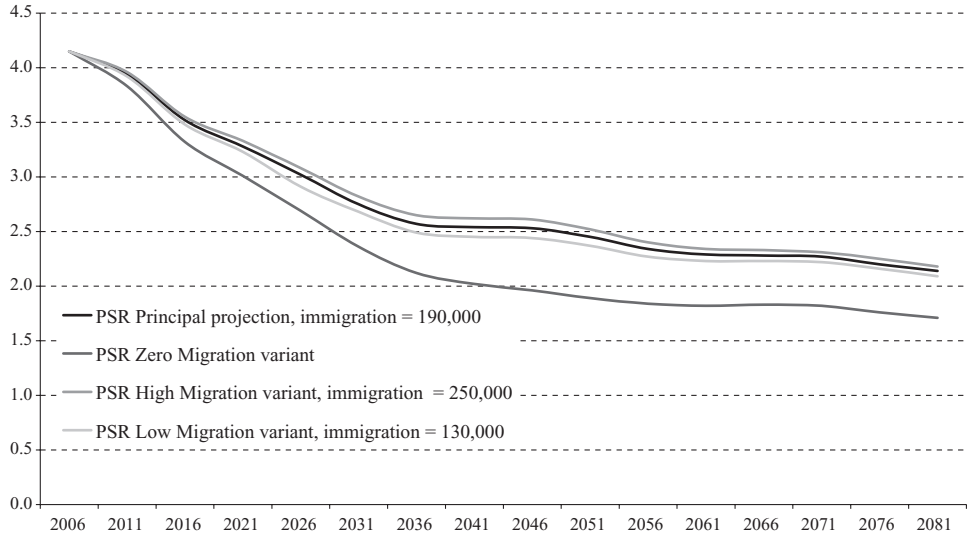
As politicians, media, and the pressure groups have become aware of the inevitable prospect of population ageing and the end of population growth and its possible decline, the rejuvenating effect of immigration has seemed increasingly attractive. These concerns need no elaboration: the end of growth in the labour force, its numerical decline, an increasing predominance of older and supposedly less productive workers, the cost of supporting pension systems and old-age care (Nyce and Schieber, 2005). An end of prosperity as we know it; a world of 'old people, living in old dwellings, pondering old ideas', as Alfred Sauvy gloomily mused (Chesnais (ed.), 2000, p. 32).

Immigration, some have believed, can solve all that. It can sustain or expand population size, rejuvenate the workforce, and rectify the ageing population while saving the natives from the trouble of reproduction. Immigration cannot be stopped, so might as well be enjoyed. Thus everyone gets what they want and lives happily ever after. Given this climate of opinion, unusual attention was focused upon a report from the UN Population Division (UN, 2000) on 'replacement migration', which has been widely reported and widely misunderstood (Leridon, 2000; Teitelbaum, 2004). It determined, up to mid-century, the number of immigrants that would be needed by low-fertility counties if they were to import immigrants to preserve overall population size, the size of the workforce, and the age-structure of the population. It awakened among the credulous the prospect of demographic salvation from population ageing by migration. It was understood to be informing the less fertile nations of the industrial world that substantial increases in immigration, some of them astronomical, were the only option in many cases to population ageing and decline.

Migration can indeed maintain or increase population size in populations with sub-replacement fertility, as we have seen. In ageing populations it can preserve the size of the working-age populations, albeit with greater and more variable inflows. With larger inflows it can preserve the age structure. However immigrants also age, so the immigration required to achieve these goals increases progressively over time. In this respect, reliance on immigration to solve such problems has much in common with a Ponzi scheme. Furthermore, with sub-replacement fertility, the population is eventually all of immigrant origin.

The usual yardstick of effectiveness of demographic responses to population ageing is the effect upon the potential support ratio (PSR). The PSR is the number of persons of nominal working age (conventionally 15–64, or in the more realistic Eurostat usage, 20–59), in relation to the number of persons of pensionable age, assumed to be 65 and over. On the 15–64/65+ boundaries, the PSR is just over 4 in most European countries today. It is projected to decline to about 2, or to about 1.5 in low-fertility countries, by mid-century. The PSR is a purely demographic measure. The actual support ratio—the number of persons in work in relation to the number of those receiving pensions (or more broadly, not in employment at any age)—is already below 2 or approaching 1, depending on definition (see Coleman, 2002, and Coleman and Rowthorn, 2004).

Figure 7: Comparison of UK PSR with various migration scenarios, 2006–81



Source: GAD 2006-based projections.

The potential support ratios implied by the principal projection and the natural change (no migration) variants of the latest UK population projections are compared in Figure 7. The 190,000 annual immigrants assumed in the principal projection does make a difference to the PSR (2.45 in 2051 instead of 1.89 with zero migration) but at significant demographic cost (an extra 15m people by 2051, 25m by 2081). And there is no 'salvation' to be had in it; PSR continues to decline under all migration variants. The level of 'replacement migration' in the UN (2000) study required to maintain the UK support ratio at the present level of 4.15 to mid-century would need an average annual net inflow of 1.2m immigrants. According to calculations by GAD, the UK population would accordingly reach 100m by 2030, 200m by 2070, 300m by 2090, and so on *ad infinitum* (see Shaw, 2001).

The general answer to these questions has been known for many years, both in theory and from empirical studies (Lesthaeghe *et al*., 1988; Wattelar and Roumans, 1991; Blanchet, 1989; Calot, 1983; Kuijsten, 1995; van Imhoff and Keilman, 1996). The European Commission (1996) showed that to preserve the current PSR of the 15 EU countries would require 4.5m (net) immigrants per year by 2007, 7m net per year by 2024, and so on. In the extreme case, preserving the PSR of 2000 in Korea would require the entire current population of the world to go to live there by 2050 (UN, 2000, p. 56). Despite all that, the deceptive allure of 'replacement migration' has been persistent among journalists and politicians.

The effects of past immigration on the age structure of existing populations (from a time when immigration was less intense than today) have been slight (Murphy, 1995; Beaujot and Matthews, 2000, p. 6; Coleman *et al*., 2002). A higher birth rate is a more effective medium-term way of moderating ageing. But even replacement-level fertility (about 2.05), which few demographers expect, would only maintain PSR at about 2.5, although without migration or any long-term population growth. Population ageing cannot be 'solved'. Noting that these basic conclusions were understood 20 years ago, McKellar (2006, p. 368) has begged for a moratorium on 'replacement migration' scenarios. That is long overdue.

Demography is not everything. For most of western Europe, demographic calculations on ratios of populations of working age distract attention from the size of the actual workforce, which is usually much smaller. Participation rates vary from 65 to 85 per cent in Europe. Gloomy scenarios for the future make the implausible assumption that workforce participation rates, and the age limits of working life, will persist unchanged, and that market forces and government action will not adapt to the new demographic and economic realities. In fact, some progress has already been made (Bogaert, 2008). The 'European Social Model' has encouraged an unfavourable but not insoluble environment for coping with population ageing, where workforce participation rates, ages of pension entitlement, and actual retirement are low, and unemployment, especially youth unemployment, relatively high. Long periods spent in tertiary education delay entry to the labour market (Skirbekk, 2005) and excessive job protection deters it (McDonald and Kippen, 2001).

Europe has reserves of employable manpower which potentially exceed short-term demographic deficiencies, although its mobilization will require difficult readjustments. The effects of enhanced workforce participation to age 65 cannot extend much beyond 2025 (Punch and Pearce, 2000; Schoenmaeckers and Kotowska, 2005). Adjustment of retirement age in line with increased life-expectation is the most effective response. According to Feld (2005), given adjustments already in train, general increases in labour migration over and above present levels are not needed to satisfy quantitative workforce deficiencies in much of Western Europe (special skills excepted) for up to 2020. On a longer time-scale, McDonald and Kippen (2001), and Lesthaeghe (2004), come to less favourable conclusions. Italian experts insist that further immigration for workforce purposes (already high) is unavoidable in view of the persistently low Italian birth rate (Golini, 2004) and that the combination could even be developed to advantage (Dalla Zuanna, 2006).

XIII. Effects on population composition

Immigration cannot 'solve' population ageing. But in parallel with its potentially powerful effects on population size, it can radically and permanently affect the composition of the population according to national or ethnic origin. It is doing so in most Western countries. Any country with sub-replacement fertility and with constant levels of immigration must eventually acquire a population of predominantly, eventually entirely, immigrant origin. Populations which adopt that solution to stabilize their numbers must accept the prospect of substantial change in their original identity.

There has always been immigration to Europe, some of it from remote origins. For the most part earlier inflows were modest in scale or short-term and have retained only a symbolic ethnicity, or survive as surnames rather than self-conscious groups: Flemings, Germans, Huguenots, and most of the Irish in Britain; Poles, Hungarians, Italians, and others in France. Post-war immigration from outside Europe has been on an altogether bigger scale and more distinctive in terms of culture, religion, language, and physical appearance. Large population sizes, urban segregation, traditional community structures, arranged marriage, and ease of communication with countries of origin, have helped to preserve or even accentuate minority self-awareness into the second and later generations, transforming the population composition of many urban areas and schools.

In response to these changes and to difficulties of economic and social integration that have arisen, a number of European statistical offices have made projections of these foreign-origin

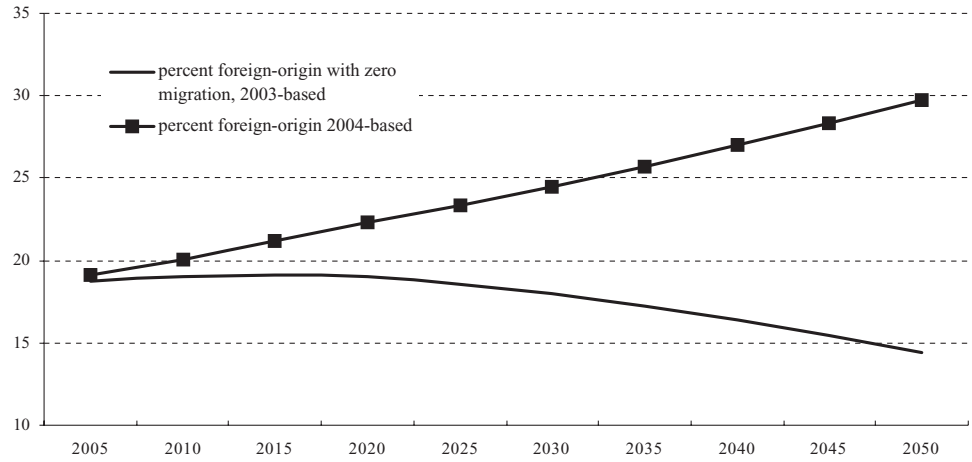
Table 5: Summary of population projections by 'foreign origin' or 'foreign background', selected countries

	Austria		Denmark		Germany		Netherlands	
	2005	**2050**	**2005**	**2050**	**2005**	**2050**	**2005**	**2050**
Population (millions)	8.1	7.8	5.4	5.5	82.2	68.3	15.9	16.9
Immigration rate	0.07	0.2	0.29	0.21	0.25	0.27	0.17	0.27
Western %	5.4	7.9	2.4	3.3	3.3	5.4	8.6	13.2
Non-Western %	3.9	5.1	6.3	11.5	6.6	18.2	8.9	16.5
Foreign origin %	9.3	***28.0***	8.7	**14.8**	9.9	**23.6**	17.5	**29.7**
	Norway		**Sweden**		**UK**		**USA**	
	2005	**2050**	**2005**	**2050**	**2005**	**2050**	**2005**	**2050**
Population (millions)	4.6	5.6	9.0	10.6	52.0	63.1	287.7	403.7
Immigration rate	0.37	0.30	0.37	0.29	0.50	0.27	0.35	0.24
Western %	4.1	9.2	9.7	10.5	2.7	11.6		
Non-Western %	3.4	14.3	6.3	10.7	8.7	24.5		
Foreign origin%	7.5	**23.5**	15.9	**32.3**	11.4	**36.1**	17.6	***33.2***

Note: US data include non-white foreign origin only. White immigrants comprised 17–19 per cent of immigrants, 2000–50. Austrian total percentage 'foreign origin' (28 per cent) excludes naturalization. Sub-totals are not available excluding naturalization and therefore only sum to 13 per cent. That illustrates the effect of taking naturalization into account in projections of this kind.
Source: For sources and details of assumptions and methods see Coleman (2006).

populations to mid-century and beyond. Here 'foreign origin' or 'foreign background' is taken to include the first and the second generation, using register data on the birthplace and nationality of individuals and their parents. A varying number of categories are projected, depending on the origins of immigrants in the country concerned. In most cases these are brigaded together in the projections as 'Western' and 'non-Western'. Here, 'Western' countries, on OECD criteria, are European countries together with developed countries overseas such as the USA and Canada. 'Non-Western' countries are the other countries, from the less-developed realm. At present, between 8 and 18 per cent of Western European populations are of 'foreign origin' defined in this way (Table 5). Among them, in around 2000, the proportion of 'Western' origin was between one-third to over one-half. Thanks to assumptions of continued immigration and persistent, though diminishing, differential fertility, the 'non-Western' element in most projections grows much faster than the other. By mid-century, between 15 and 30 per cent of the total population is 'foreign origin' (Table 5), with much higher proportions in younger age groups and in urban areas. In all these projections, fertility is assumed to converge to the national average or close to it and all groups share common upward trends in survival. Immigration, not differential fertility or age-structure effects, is the predominant growth factor. In most of the projections, foreign-origin populations are assumed to assimilate to the national populations after the second generation and are therefore lost to statistical view. That understates the minority growth compared with the potentially permanent but self-ascribed ethnic and racial categories used in the UK and US projections. In respect of some groups it may be realistic to assume that demographic and cultural distinctions will become negligible by the third generation. But in others, mostly from outside Europe, cultural and socioeconomic differences, and strength of identity, have persisted or hardened in the second generation compared with the first. The transforming effect of immigration on population composition is illustrated by a comparison between the Netherlands

Figure 8: Netherlands, 2005–50—percentage of population of foreign origin (Western and non-Western) with and without migration



Source: CBS.

Central Bureau of Statistics (CBS) medium variant projection with the CBS zero-migration projection (Figure 8). Most projections extend only to 2050 or 2060. Were immigration to continue at the assumed rate, the ethnic change would continue *pro rata* beyond that date.

The growth of foreign-origin populations also implies major changes in the relative prevalence of religious belief (Kaufmann, 2006). In Great Britain, the number of Christian churchgoers has been projected to fall from 3.9m in 2005 to 900,000 by 2050, assuming that church attendance continues its decline and the churchgoing population continues to age. By contrast, given continued immigration, robust levels of religious adhesion, and a youthful age-structure, active Muslims are expected to increase from 900,000 to 2.7m by 2050, Hindus from 360,000 to 860,000, and others from 460,000 to 770,000 (Brierley, 2008, Tables 12.7, 12.8). Projections of this kind are much affected by non-demographic factors, such as conversion and lapsing, as well as by demographic change. Using a more sophisticated approach to projection, the population of Austria is expected to be between 14 and 26 per cent Muslim by 2051, from 4 per cent in 2001 (Goujon *et al*., 2006). The consequences or desirability of these cultural changes is little discussed. But unless migration flows alter, or are changed by immigration policy, an increasingly obvious and irreversible transition of the origins of Western European populations will be well under way after mid-century.

XIV. Conclusions

In Europe since the 1960s, immigration has turned from being a relatively minor and neglected component of change into the most dynamic demographic element and the least predictable. The fragility and foreseeable end of natural increase in many Western populations, and the

magnitude of inflows, makes migration the dominant factor in modern Western population growth, current and projected.

Migration data are inadequate. Because they are generated by different national administrative and legal provisions, they are difficult to compare internationally. Explanatory theory is also inadequate, and projections based on theory as opposed to the cautious assumptions of linear extrapolation of immigration levels are correspondingly hard to make. It is difficult to justify any alternatives to the default assumption of long-term constant migration incorporated into almost all official projections. These at least show the implications of the continuation of current migration.

Migration does not act in isolation from other demographic variables. Its effects need to be integrated more into demographic thinking, in terms of overall population reproduction, and the interactive relationships with birth and death rates, and between immigration and emigration. Its demographic impact varies greatly in time and space. Political and policy change, at home and abroad, intended and unintended, can be very important in determining levels and trends. Immigration can go down as well as up.

In parts of north-western Europe and Scandinavia, immigration combined with near-replacement fertility has re-started considerable population growth, on current assumptions adding 20 per cent or more to the populations of Norway, the UK, Ireland, and others. That projected growth, with its implications for housing demand and new infrastructure is by no means welcome in crowded counties such as the Netherlands. In Germany, Austria, and southern Europe, substantial inflows can maintain population size or at least moderate decline. In Spain, however, official recognition of the scale of illegal immigration through amnesty has transformed demographic expectations. Net immigration of 636,000 in 2006 increased Spain's population by 1.4 per cent; population decline has been postponed. In some countries of eastern Europe, by contrast, emigration has exacerbated population decline—and ageing, too, as most of the emigrants are youthful. But patterns can change. For example Russia lost 110,000 people to net emigration in 2003 but by 2007 net immigration, much of it from Central Asia, had risen to 241,000.

The onset of population ageing, and the potential decline of population and workforce have concentrated attention on managed migration policy to increase inflows as a solution. However, for intractable technical reasons immigration cannot solve population ageing or provide other than a moderate amelioration even with high inflows. Higher birth rates are a more demographically efficient response in the medium term, although that option, too, is limited.

In cultural and social terms, the most enduring and possibly the most significant effect implicit in high levels of migration into low-fertility populations is the progressive transformation of the ancestry of the population and—depending on levels of integration—its culture, politics, religion, and language. Available projections of population origin show that, on recent trends, foreign-origin populations will increase by up to 30 per cent of the total population of some western European countries by mid-century on an approximately linear upward trend.

Projections are too often endowed by their consumers with a quality of inevitability which they do not possess. Of all the components of population change, migration is the least stable and the most difficult to forecast. It can go down as well as up, and has. While many factors point to continued high inflows to many countries, policy influences—in either direction—can be decisive, along with other factors much more random in nature. Projections usefully highlight the implications of the continuation of current or imagined patterns and policies. They are not the actual future.

References

Baines, D. (1991), *Emigration from Europe 1815–1930*, London, Macmillan.

Beaujot, R., and Matthews, D. (2000), 'Immigration and the Future of Canada's Population', Discussion Paper No 00–1, London, Ontario, Population Studies Center, University of Western Ontario.

Blanchet, D. (1989), 'Regulating the Age-structure of a Population through Migration', *Population* (English selection), **44**(1), 23–37.

Bogaert, H. (2008), 'Long-term Population Projections in Europe: How they Influence Policies and Accelerate Reforms', Work Session on Demographic Projections, Bucharest 10–12 October 2007, Eurostat, Luxembourg, Office for the Official Publications of the European Communities, 25–46.

Brierley, P. (ed.) (2008), *UK Christian Handbook Religious Trends 7 2007/2008. British Religion in the 21st Century: What the Statistics Indicate*, Swindon, Christian Research.

Calot, G. (1983), 'Les perspectives démographiques françaises', *Futuribles*, **67**(7–28).

— Sardon, J. -P. (2001), 'Fécondité, Reproduction et Remplacement', *Population*, **56**(3), 337–96.

Chesnais, J. C. (ed.) (2000), *Alfred Sauvy: La Vieillesse des Nations. Textes Choisis, Présentés et Annotées par Jean-Claude Chesnais*, Paris, Gallimard.

Coleman, D. A. (2002), 'Who's Afraid of Low Support Ratios? An Unofficial Response to the UN Population Division Report on Replacement Migration', *Population Bulletin of the United Nations Special Issue: Expert Group Meeting on Policy Responses to Population Aging and Population Decline*, 44/45, 288–329.

— (2006), 'Immigration and Ethnic Change in Low-fertility Countries: A Third Demographic Transition', *Population and Development Review*, **32**(3), 401–46.

— Rowthorn, R. (2004), 'The Economic Effects of Immigration to the United Kingdom', *Population and Development Review*, **30**(4), 579–622.

— Compton, P., and Salt, J. (2002), 'Demography of Migrant Populations: The Case of the United Kingdom', in W. Haug, P. Compton, and Y. Courbage. (eds), *Demographic Characteristics of Immigrant Populations. Population Studies No. 38*, Strasbourg, Council of Europe, 497–552.

Courbage, Y., and Khlat, M. (1996), 'Mortality and Causes of Death of Moroccans in France, 1979–91', *Population: An English Selection*, **1996**(8), 59–94.

Dalla Zuanna, G. (2006), 'Population Replacement, Social Mobility and Development in Italy in the Twentieth Century', *Journal of Italian Modern History*, **11**(2), 188–208.

Davis, K. (1963), 'The Theory of Change and Response in Modern Demographic History', *Population Index*, **21**, 345–66.

Dumont, J.-C., and Lemaître, G. (2005), 'Counting Immigrants and Expatriates in OECD Countries: A New Perspective', OECD Social, Employment and Migration Working Papers No. 25, Paris, Organization for Economic Cooperation and Development.

Ediev, D., Coleman, D. A., *et al*. (2007), 'Migration as a Factor in Population Reproduction', European Demographic Research Papers 1, Vienna, Vienna Institute of Demography of the Austrian Academy of Sciences.

European Commission (1996), *The Demographic Situation in the European Union 1995*, Luxembourg, Office for Official Publications of the European Communities.

— (2005), *Confronting Demographic Change: A New Solidarity between the Generations*, Brussels, European Commission.

Eurostat (2007), 'First Demographic Estimates for 2006', *Statistics in Focus—Population and Social Conditions*, 41, 7.

Feld, S. (2005), 'Labor Force Trends and Immigration in Europe', *International Migration Review*, **39**(3), 637–62.

Freeman, G. S. (1994), 'Can Liberal States control Unwanted Migration?', *Annals of the American Association for Political and Social Sciences*, 534, 17–30.

GAD (2007), *Population Projections of the United Kingdom, 2006-based*, London, Government Actuary's Department.

Golini, A. (2004), 'Possible Policy Responses to Population Ageing and Population Decline: The Case of Italy', *Population Bulletin of the United Nations*, Special Issue, 44/45: Policy Responses to Population Ageing and Population Decline, 150–70.

Goujon, A., Skirbekk, V., *et al*. (2006), 'New Times, Old Beliefs: Projecting the Future Size of Religions in Austria', VID Working Papers 01/06, Vienna, Vienna Institute of Demography.

Hatton, T. J. (2005), 'Explaining Trends in UK Immigration', *Journal of Population Economics*, **18**(4), 719–40.
Hollifield, J. F. (2000), 'The Politics of International Migration: How can we 'Bring the State back in'?' in C. Brettell and J. F. Hollifield. (eds), *Migration Theory: Talking Across Disciplines*, London, Routledge, 137–85.
Home Office (2008), *Accession Monitoring Report May 2004 – December 2007 A8 Countries*, London, Home Office, Border and Immigration Agency, available at http://www.bia.homeoffice.gov.uk/sitecontent/documents/aboutus/Reports/accession_monitoring_report/
House of Commons Treasury Committee (2008), 'Counting the Population', Eleventh Report of Session 2007–08, Volume 1, HC 183–1, London, The Stationery Office.
Howe, N., and Jackson, R. (2005), *Projecting Immigration—A Survey of the Current State of Practice and Theory*, Washington, DC, Center for Strategic and International Studies.
Kaufmann, E. (2006), 'Breeding for God', *Prospect*, 128, 6.
Kuijsten, A. (1995), 'The Impact of Migration Streams on the Size and Structure of the Dutch Population', in S. Voets, J. Schoorl, and B. deBruijn. (eds), *The Demographic Consequences of International Migration*, The Hague, Netherlands Interdisciplinary Demographic Institute, 283–306.
Langford, C. M. (2005), 'Did the 1918–19 Influenza Pandemic Originate in China?', *Population and Development Review*, **31**(3), 473–505.
Le Bras, H. (1991), 'Demographic Impact of Post-war Migration in Selected OECD Countries', in *Migration: The Demographic Impact*, Paris, Organization for Economic Cooperation and Development, 15–26.
Lemaître, G. (2005), 'The Comparability of International Migration Statistics: Problems and Prospects', OECD Statistics Brief No. 9, July, Paris, Organization for Economic Cooperation and Development.
Leridon, H. (2000), 'Vieillissement Démographique et Migrations: Quand les Nations Unies Veulent Remplir le Tonneau des Danaïdes . . . ', *Population et Sociétés*, **358**, 2–5.
Lesthaeghe, R. (ed.) (2000), *Communities and Generations: Turkish and Moroccan Populations in Belgium*, Brussels, Centrum vor Bevolkings- en Gezinsstudie (CBGS), Vlaamse Wetenschappelijke Instelling.
— (2004), 'Europe's Demographic Issues: Fertility, Household Formation and Replacement Migration', *Population Bulletin of the United Nations*, Special Issue Nos. 44/45 2002: Policy Responses to Population Ageing and Population Decline, 385–423.
— Page, H., *et al*. (1988), 'Are Immigrants Substitutes for Births?', IDP Working Paper 1988–3, Brussels, Free University Brussels, InterUniversity Programme in Demography.
Lievens, J. (1999), 'Family-forming Migration from Turkey and Morocco to Belgium: The Demand for Marriage Partners from the Countries of Origin', *International Migration Review*, **33**(3), 717–44.
Lutz, W., O'Neill, B. C., *et al*. (2003), 'Europe's Population at a Turning Point', *Science*, **299**, 1991–2.
— Vaupel, J. W., et al. (eds) (1999), 'Frontiers of Population Forecasting', Supplement to Population and Development Review 24, 1998, New York, Population Council.
McDonald, P., and Kippen, R. (2001), 'Labor Supply Prospects in 16 Developed Countries 2000–2050', *Population and Development Review*, **27**(1), 1–32.
McKellar, L. (2006), 'Europe's Future Generations: Closing Thoughts', in W. Lutz, R. Richter, and C. Wilson. (eds), *The New Generations of Europeans*, London, Earthscan, 353–74.
McNeill, W. H. (1977), *Plagues and Peoples*, Oxford, Basil Blackwell.
Martin, P. L. (1995), 'Germany: Reluctant Country of Immigration', in W. A. Cornelius, P. L. Martin, and J. F. Hollifield. (eds), *Controlling Immigration: A Global Perspective*, Stanford, CA, Stanford University Press, 189–227.
Massey, D., and Zenteno, R. (1999), 'The Dynamics of Mass Migration', *Proceedings of the National Academy of Sciences*, **96**, 5328–35.
Mayhew, S. (2004), *A Dictionary of Geography*, Oxford, Oxford University Press.
Mitchell, J., and Pain, N. (2003), 'The Determinants of International Migration into the UK: A Panel Based Modelling Approach', NIESR Discussion Papers 216, London, National Institute of Economic and Social Research.
Murphy, M. (1995), 'The Impact of Migration on Population Composition: The British Case', in S. Voets, J. Schoorl, and B. de Bruijn. (eds), *The Demographic Consequences of International Migration*, NIDI Report No. 44, The Hague, Netherlands Interdisciplinary Demographic Institute, 207–24.
Nyce, S. A., and Schieber, S. J. (2005), *The Economic Implications of Aging Societies: The Costs of Living Happily Ever After*, Cambridge, Cambridge University Press.

OECD (2006), *International Migration Outlook. SOPEMI 2006*, Paris, Organization for Economic Cooperation and Development.
— (2007), *International Migration Outlook. SOPEMI 2007*, Paris, Organization for Economic Cooperation and Development.
Østby, L. (2002), *The Demographic Characteristics of Immigrant Populations in Norway*, Oslo, Statistics Norway.
Pinkerton, C., McLaughlan, G., *et al*. (2004), 'Sizing the Illegal Immigrant Population in the UK', Home Office Online Report 58/04, London, Home Office.
Poulain, M., Perrin, N., *et al*. (2006), *Towards Harmonised European Statistics on European Migration (THESIM)*, Louvain la Neuve, Universitaires de Louvain Presses.
Preston, S. H., and Wang, H. (2007), 'Intrinsic Growth Rates and Net Reproduction Rates in the Presence of Migration', *Population and Development Review*, **33**(4), 657–66.
Punch, A., and Pearce, D. L. (eds) (2000), *Europe's Population and Labour Market Beyond 2000*, Strasbourg, Council of Europe.
Raymer, J., and Willekens, F. (eds) (2008), *International Migration in Europe. Data, Models and Estimates*, Chichester, John Wiley.
Rees, P. H., and Kupiszewski, M. (1999), 'Internal Migration and Regional Population Dynamics in Europe: A Synthesis', *Population Studies*, 32, Strasbourg, Council of Europe Publishing.
Rendall, M. S., and Ball, D. J. (2004), 'Immigration, Emigration and the Ageing of the Overseas-born Population in the United Kingdom', *Population Trends*, **116**(Summer), 18–27.
Salt, J. (2004), *International Migration and the United Kingdom*, Report of the United Kingdom SOPEMI Correspondent to the OECD, London, Migration Research Unit, University College London.
— (2005), *Current Trends in International Migration in Europe*, Strasbourg, Council of Europe.
—(2006), *International Migration and the United Kingdom*, Report of the United Kingdom SOPEMI Correspondent to the OECD, London, Migration Research Unit, University College London.
— Singleton, A., *et al*. (1994), *Europe's International Migrants. Data Sources, Patterns and Trends*, London, HMSO.
Sauer, L., and Ette, A. (2007), *Auswanderung aus Deutschland: Stand der Forschung und erste Ergebnisse zur internationalen Migration deutsche Staatsbürger*, Wiesbaden, Bundesinstitut für Bevölkerungsforschung.
Schoenmaeckers, R., and Kotowska, I. (2005), 'Population Ageing and its Challenges to Social Policy', Council of Europe Population Studies No. 50, Strasbourg, Council of Europe.
Sellier, A., and Sellier, J. (2002), *Atlas des Peuples d'Europe Centrale*, Paris, La Découverte.
Shaw, C. (2001), 'United Kingdom Population Trends in the 21st Century', *Population Trends*, **103**, 37–46.
— (2008), 'Results of the National Population Projections Expert Group Questionnaire', BSPS Day Meeting on Population Projections, London School of Economics.
Skirbekk, V. (2005), *Why not Start Younger? Implications of the Timing and Duration of Schooling for Fertility, Human Capital, Productivity and Public Pensions*, Laxenburg, International Institute for Applied Systems Analysis.
Smallwood, S., and Chamberlain, J. (2005), 'Replacement Fertility, What has it Been and What does it Mean?', *Population Trends*, **119**(Spring),16–27.
Sobotka, T. (2008*a*), 'The Rising Importance of Migrants for Childbearing in Europe', in T. Frejka, J. Hoem, L. Toulemon and T. Sobotka. (eds), *Childbearing Trends and Policies in Europe*, Rostock, MPIDR.
— (2008*b*), 'Does Persistent Low Fertility Threaten the Future of European Populations?', in J. Surkyn, J. van Bavel, and P. Deboosere. (eds), *Demographic Challenges for the 21st Century. A State of Art in Demography*, Brussels, VUBPRESS.
Spencer, S. (ed.) (1994), *Strangers and Citizens: a Positive approach to Migrants and Refugees*, London, Institute for Public Policy Research/Rivers Oran Press.
Teitelbaum, M. S. (2004), 'The Media Marketplace for Garbled Demography', *Population and Development Review*, **30**(2), 317–27.
Toulemon, L. (2004), 'La Fécondité des Immigrées: Nouvelles Données, Nouvelle Approche', *Population et Sociétés*, **400**(April), 1–4.
Tribalat, M., Garson, J.-P., *et al*. (1991), *Cent Ans D'Immigration: Etrangers d'Hier, Français d'Aujoud'hui*, Paris, Presses Universitaires de France.

United Nations (1998), 'Recommendations on Statistics of International Migration Revision 1', Statistical Series M, no. 58 rev. 1, New York, United Nations.

—(2000), *Replacement Migration: Is it a Solution to Declining and Ageing Populations?*, New York, United Nations.

van Dalen, H. P., and Henkens, K. (2007), 'Longing for the Good Life: Understanding Emigration from a High-Income Country', *Population and Development Review*, **33**(1), 37–66.

van Imhoff, E., and Keilman, N. (1996), 'The Impact of Future International Migration on Household Composition and Social Security in the Netherlands', in S. Voets, J. Schoorl, and B. de Bruijn. (eds), *Demographic Consequences of International Migration*, The Hague, Netherlands Interdisciplinary Demographic Institute, 307–24.

Wattelar, C., and Roumans, G. (1991), 'Simulations of Demographic Objectives and Migration', in *Migration: The Demographic Aspects*, Paris, Organization for Economic Cooperation and Development, 57–67.

Westoff, C., and Frejka, T. (2007), 'Fertility and Religiousness among European Muslims', paper presented to the annual meeting of the Population Association of America, New York.

Wild, S. H., Fischbacher, C., *et al*. (2007), 'Mortality from all Causes and Circulatory Disease by Country of Birth in England and Wales 2001–2003', *Journal of Public Health*, **29**(2), 191–8.

Wilson, T., and Bell, M. (2004), 'Australia's Uncertain Demographic Future', *Demographic Research*, **11**(8).

Woodbridge, J. (2005), 'Sizing the Illegal Immigrant Population in the UK', Home Office Online Report 29/05, London, Home Office.