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POPULATION AGEING AND IMMIGRATION POLICY

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scotecon is the Scottish Economic Policy Network. It is a network of economists based in Scotland's universities, which aims to stimulate academic research on the Scottish economy, particularly in those areas of interest and concern to the Scottish Parliament.

The network concentrates on increasing the quality and quantity of evidence-based research to inform policy and debate in areas such as education, enterprise, the environment, exclusion, health, rural affairs, training and transport.

scotecon is physically located at the Universities of Stirling and Strathclyde, however, it has a strong virtual presence through the web-site **scotecon.net**, which is being developed as a major focus for intelligence on the Scottish economy.

The Scottish Higher Education Funding Council (SHEFC) funds the network under its Research Development Grant Scheme.

The co-directors are Professor Brian Ashcroft of the University of Strathclyde and Professor David Bell of the University of Stirling.

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Table of Contents

Executive Summary	3
1. Introduction	4
2. Current Demographic Situation in Scotland	6
3. One Demographic Future - Continuation of the Status Quo	9
4. Other Demographic Futures with Increased Net Migration	10
5. Conclusions and Policy Implications	13
Acknowledgments	15
References	15

Executive Summary

- If current demographic trends continue the Scottish population will decline in size and will continue to age rapidly.
- The Scottish Executive recognises that population decline/ageing is problematic.
- If left unchecked it will likely lead to a decline in the standard of living of the Scottish people.
- The Scottish Executive is committed to increasing immigration through such policy measures as the *Fresh Talent Initiative*.
- This report evaluates the impact that increased net migration would have on population decline and population ageing.
- A series of population projections covering the period 2001 to 2041 are performed.
- In the projections specific assumptions are made about the number of net migrants and the age distribution of the net migrant population.
- These assumptions are intended to approximate a successful immigration policy that increases net migration by attracting younger workers with children to Scotland.
- The main conclusion is that such a targeted immigration policy that attracts such individuals in sufficient numbers would both stop population decline and have a sizeable decelerating effect on population ageing.
- The numbers of immigrants required to achieve these objectives is, however, not small.
- The responsibility for immigration needs to be transferred to the devolved governments.

“The single biggest challenge facing Scotland as we move further in the 21st century is our falling population.”

Jack McConnell, First Minister, Scottish Executive, February 2004

1 Introduction

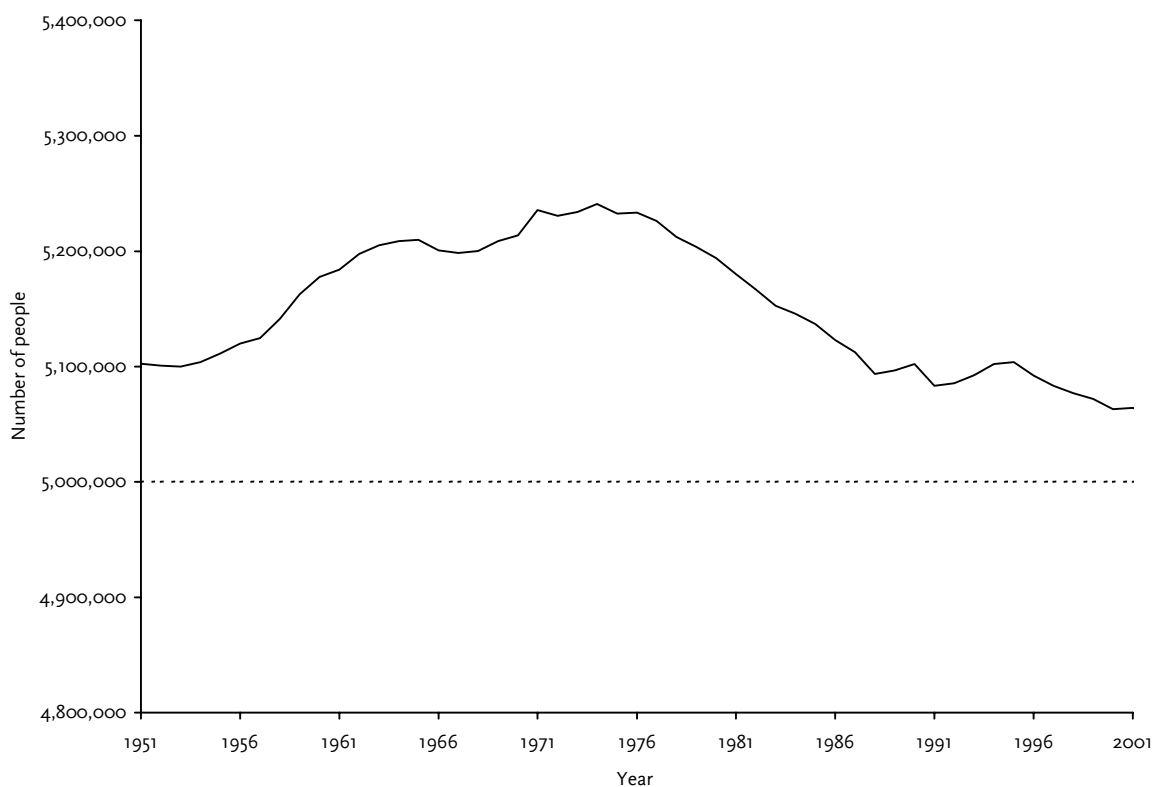
In its simplest interpretation, population ageing is the increase in the average or median age of a population. It is the process by which there is a redistribution of relative population shares away from the younger to the older age groups. Population ageing is ultimately caused by the interaction of the four main demographic variables—fertility, mortality, immigration and emigration—with fertility being the main determinant. Like most high-income industrialised countries, the population of Scotland is expected to age rapidly over the next few decades.

The ageing of the Scottish population will lead to an increase in the number of individuals of pensionable age and a decrease in the number of individu-

als of working age. This will lead to a large increase in the demand for state-supplied health care, residential services, housing, pensions and other services consumed by the elderly. Unfortunately at the same time, the base expected to pay for this increase—essentially people of working age—will become progressively smaller both in absolute numbers and in relative population share. That is, those “demanding” will increase while those “supplying” will decrease. It is not hard to imagine that such a situation of increasing imbalance is unsustainable in the long-run and some will argue that cracks caused by population ageing in Scotland’s “pay-as-you-go” welfare system are already starting to show.

There is a growing consensus that the Scottish Executive will soon find itself without the necessary

Figure 1 Population size Scotland 1951-2001



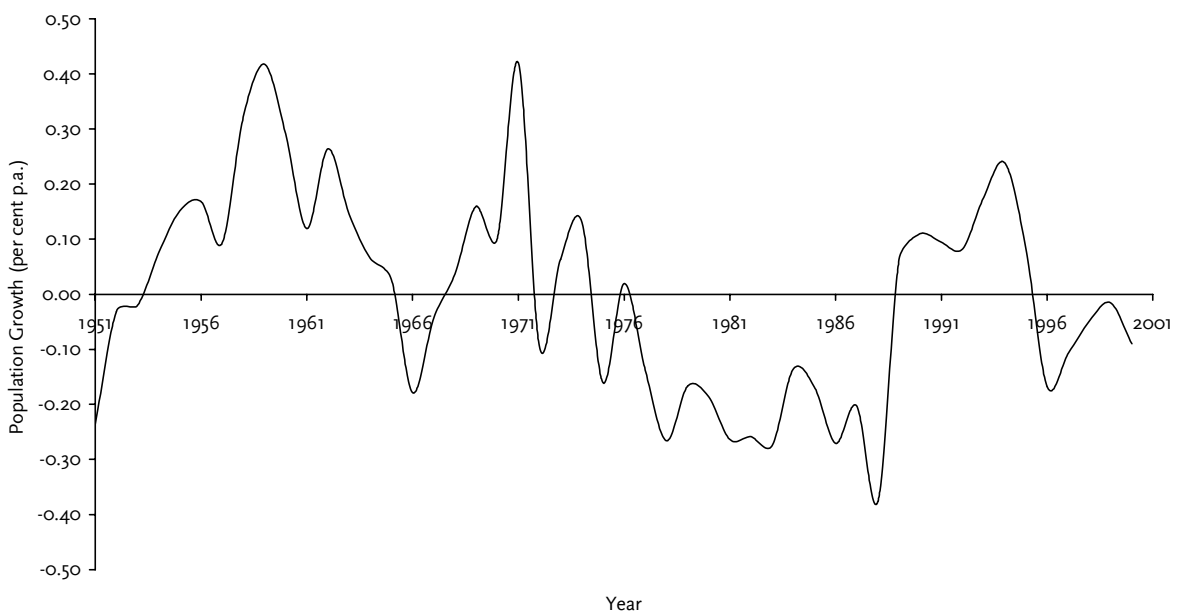
resources to accommodate the changes in the expected demand for public services and other welfare benefits targeted at the elderly caused by population ageing (see Wright, 2002a). Nevertheless, they will be expected to increase expenditure in these areas in order to ensure that the living standard of this numerically increasing segment of the population does not fall. As a population ages so does its electorate, and older people compared to younger people have much higher rates of participation in elections at all levels of government. The dilemma facing politicians is that if they do not—or cannot—accommodate the demands of their ageing electorate they will suffer dearly at the ballot box. A “greying electorate” will not vote en masse for politicians who they believe are ignoring their interests. It is, therefore, perhaps not surprising that the current cohort of politicians have recently started to comment in public that Scotland may have a “population problem”.

There is a large and growing literature concerned with the economic consequences of population ageing (see Weil, 1997 for an excellent review). For example, research has considered the impact on key

labour market variables such as productivity, earnings, employment, unemployment, mobility, migration, retirement and educational participation (see Wright, 2002b for some Scottish evidence). Likewise, serious attention has been directed towards evaluating the effect of population ageing on savings, consumption, housing and intergenerational transfers. It is safe to conclude that not all the effects of population ageing are negative. For example, it is clear that population ageing will increase the demand for services consumed by older people (e.g. residential care) but at the same time will decrease the demand for services consumed by younger people (e.g. schooling). There is considerable debate surrounding what the net effect of such changes will be on key economic variables such as economic growth. It could be the case that the resources which are saved when schools are closed and teachers are shed might counterbalance the resources spent on expanding Scotland’s system of residential care for the elderly.

The purpose of this report is not to place Scotland in the context of the many themes that make up the

Figure 2 Population growth Scotland 1951-2001



debate concerning the economic and social consequences of population ageing. My starting position is that population ageing is both undesirable and problematic and if unchecked will lead to a substantial and sustained fall in the standard of living of the Scottish people. Such a starting position, although pessimistic, is not unrealistic when one considers the problems faced by other countries having to cope with changes brought about by population ageing (with Germany at the moment perhaps being the best example). This report examines what public policy action can be taken to decelerate the population ageing process. More specifically, this report evaluates the impact that a successful “Scottish-specific” immigration policy that leads to a sizable increase in net migration levels could have.

The remainder of this report is organised as follows. Section 2 examines past trends in the four main demographic variables mentioned above—fertility, mortality, immigration and emigration. The purpose of this section is to describe the mechanisms that are “causing” the Scottish population to age. Section 3 is concerned with one future, which is the continuation of the status quo. More specifically, it examines what will happen if current

demographic trends continue. Section 4 examines a set of alternative futures. In this section, a set of population projections are carried out under different assumptions relating to the level of net migration. The analysis is intended to approximate a successful immigration policy that increases net migration by attracting younger workers with children to Scotland. Conclusions and policy implications follow in Section 5.

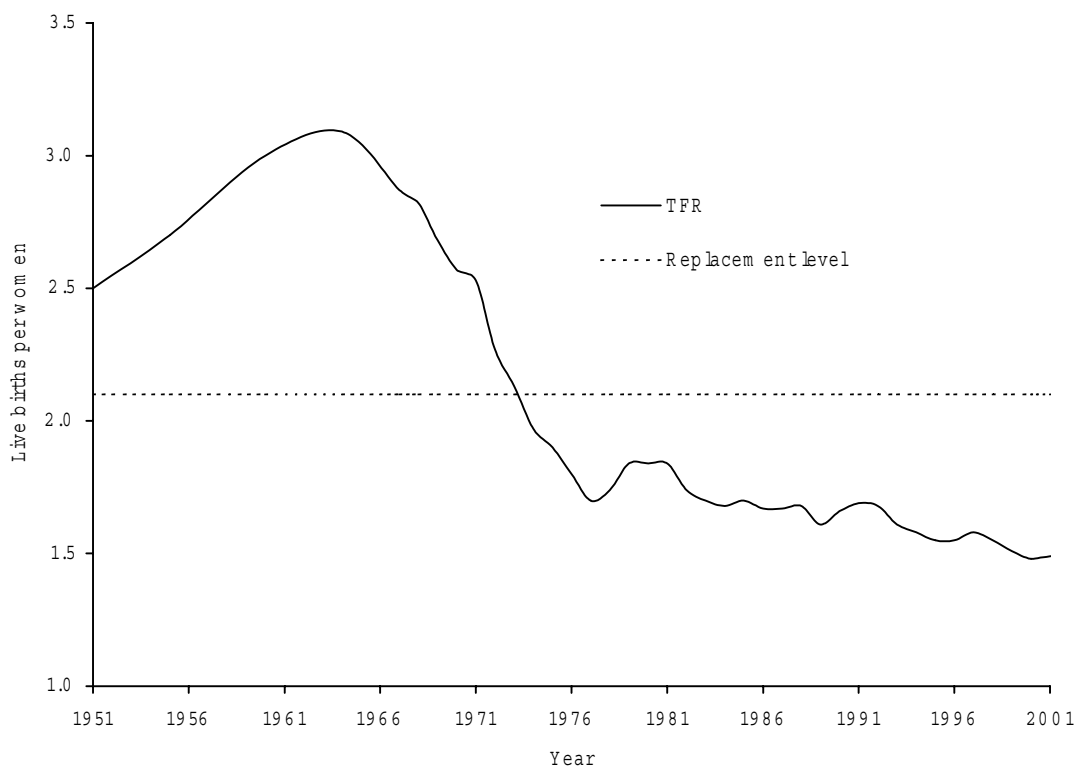
2 Current demographic situation in Scotland¹

It is worth describing clearly at the outset the mechanisms that cause a population to change in size. Below is what demographers usually refer to as the “population growth identity”:

$$\Delta N = B - D + I - E$$

where: “ ΔN ” is change in population size (N); “ B ” is the number of births; “ D ” is the number of deaths; “ I ” is the number of immigrants and “ E ” is the number of emigrants. From this identity there are two ways a population can grow or decline. The first

Figure 3 Total fertility rate Scotland, 1951-2001



is by “natural increase” ($B-D$), which is simply the difference between the number of births and deaths. The second is by “net migration” ($I - E$), which is simply the difference between the number of immigrants (i.e. individuals entering a country) and emigrants (i.e. individuals leaving a country).

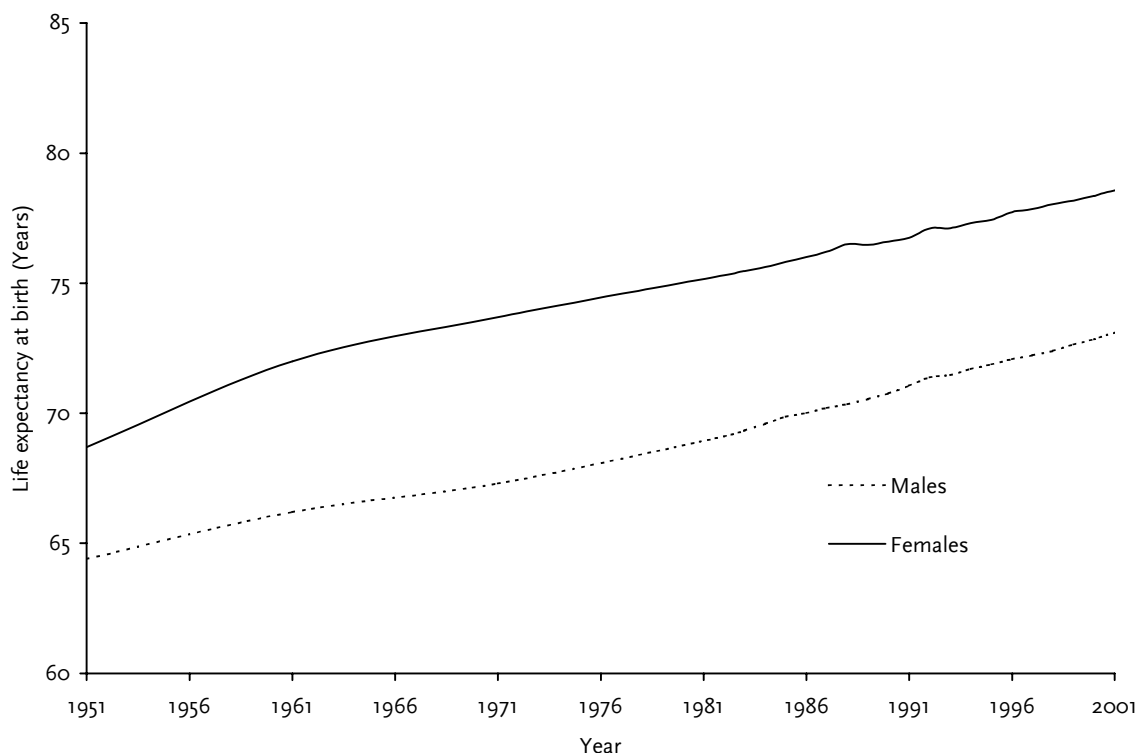
Figure 1 shows the size of the Scottish population over the period 1951 to 2001. Several features about this trend are worth noting. The first is that throughout this period the population has remained above five million (also shown in Figure 1). The second is that in this period the absolute size of the Scottish population has not varied much. The third is the current size of the population is about the same as in 1951. In other words, throughout this period, the average rate of population growth was effectively zero. This is confirmed in Figure 2 which shows the year-on-year annual rate of population growth. In this period the rate of growth never exceeded one-half of a per cent per year. In fact, in many years population growth was negative, especially in the period 1975 to 1990. In order to understand this pattern of “no growth” it is essential to examine the trends in fertility, mortality and net migration during the period.

2.1. Fertility

Figure 3 shows the total fertility rate for the period 1951 to 2002. This is a period measure of fertility that summarized the number of children that a woman would be expected to have if she passed through the child-bearing years of age 15 to 49 bearing children at the rates that prevail in any particular year. Also shown in this figure is the so-called “replacement level” of fertility of approximately 2.1 live births per woman. This is the level of fertility required so that the number of births equals the number of deaths and the population size remains constant (assuming zero net migration).

Scotland, in keeping with most other industrialised countries, experienced a sharp increase in fertility in the 1950s and 1960s. In these so-called “baby boom” years, fertility was well above the replacement level, with the total fertility rate peaking at around 3.2 births per woman in 1965. However, since then, the trend has been downwards. More importantly since about 1975, fertility has been below the replacement level. The current level of fertility is about 35 per cent below the replacement level and this represents a halving of the total fertility rate

Figure 4 Life expectancy at birth Scotland, 1951-2001



since the peak of the baby boom. It is also worth noting that over the past two decades, the total fertility rate in Scotland has been below that for the United Kingdom and is currently the lowest of the four countries that constitute the United Kingdom.²

2.2 Mortality

As in most industrialised countries, in the past century in Scotland there has been a considerable decrease in mortality in all age groups. For example, Figure 4 shows life expectancy at birth for women and men in the period 1951 to 2001. In 1951, life expectancy at birth was 68.7 years for women and 64.4 years for men. By 2001, it had risen to 78.6 years for women and 73.1 years for men. However, despite this impressive progress, such changes in mortality have not been a main determinant of population ageing. While it is true that the fact that older people are living longer does reinforce the ageing process, it is not a key cause. The reason is simply that mortality has declined at all ages and therefore its effect on the age distribution has largely been largely neutral.

2.3 Net Migration

Migration has also been a factor contributing to population ageing, although like mortality, its overall impact has been very small. Figure 5 shows the trend in net migration—the difference between immigrants and emigrants—for the period 1951–2001. Throughout most of this period, the number of emigrants was larger than the number of immigrants, leading to population loss. However, the current situation is effectively one of balance where the number of immigrants is equal to the number of emigrants. Immigrants and emigrants tend to share many common socio-economic characteristics, with a main one being age. On average, both immigrants and emigrants tend to come from the younger age groups. In other words, in most of this period, Scotland lost more young people than it gained, which clearly contributed to population ageing. However, the scale of net migration has not been particularly large when measured relative to the total size of the population. More specifically, in this period net migration never exceeded one per cent of the total population (and rarely reached one-half of a per cent). Even though Scotland has historically been a net loser of people,

Figure 5 Net migrants Scotland, 1951-2001



this has not been the main cause of population ageing.

3 One demographic future - continuation of the status quo

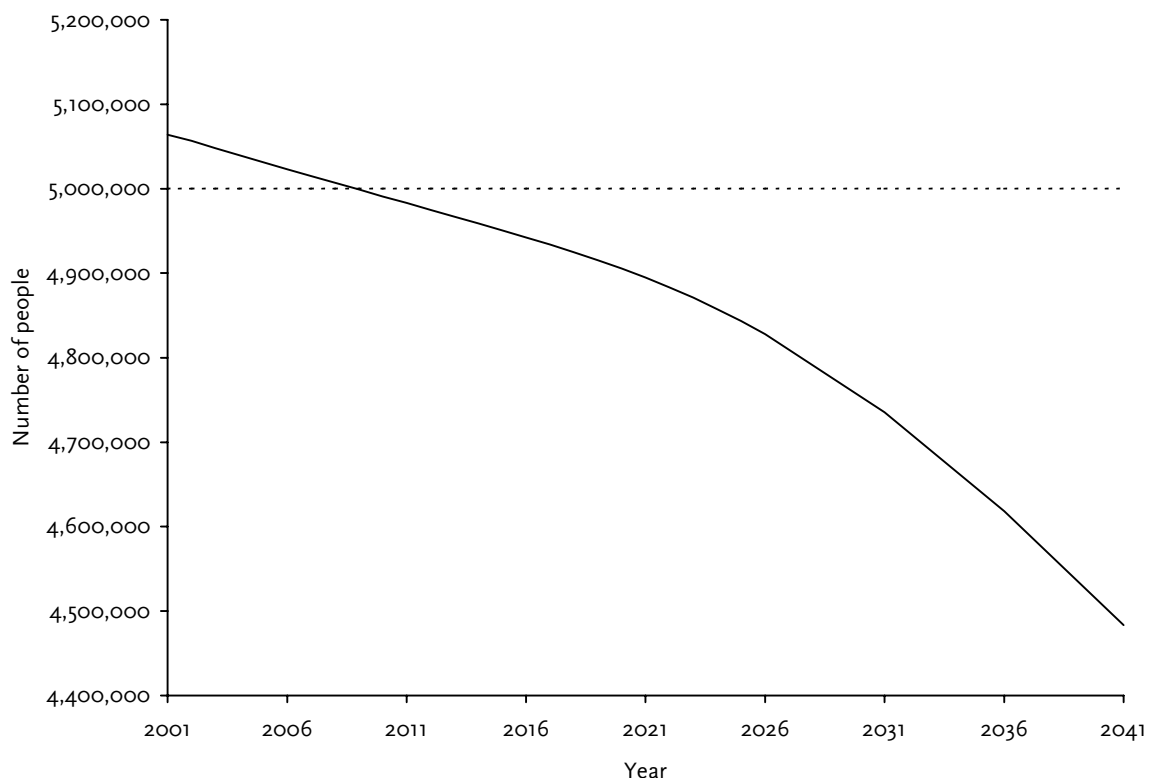
The current demographic situation in Scotland can be described as a population with below replacement level fertility, gradually decreasing mortality and zero net migration.³ If these demographic trends continue unchanged into the future, the Scottish population will be affected in two fundamental ways. The first is that it will decline in absolute size. The second is that it will continue to age rapidly.

While it is not possible to predict the future, it is possible to project what the age distribution of the population will look like given a precise set of assumptions. The most recently available set of population projections for Scotland produced by the Government Actuary's Department (GAD) are based on an extrapolation of the demographic situation prevailing in 2001 (see GAD, 2002; GROS, 2003; Wright, 2004).

The main assumptions needed to perform a population projection relate to the future levels of fertility, mortality and net migration. In the GAD's "principal" projection, it is assumed that a below-replacement level total fertility rate of 1.6 live births per women (which is slightly higher than the current rate) will prevail indefinitely into the future. It is assumed that mortality will continue to decline gradually, with life expectancy at birth increasing to 82.6 years for women and to 77.6 years for men by 2041. Finally, it is assumed the net migration will be constant at minus 1,000 people per year. The projection period covers four decades, beginning in 2001 and ending in 2041.

Based on these assumptions, the Scottish population will continue to decline in absolute numbers. Figure 6 shows the projected size of the Scottish population in the period 2001 to 2041. It will fall below 5 million by the end of this decade. The decline will continue with the size of the Scottish population falling to below 4.5 million by 2041. This four-decade decline is a reduction of over half a million people. Put in percentage terms, by 2041 the population will be about 10 per cent smaller than it currently is.

Figure 6 Population size Scotland 2001-2041 (GAD projection)



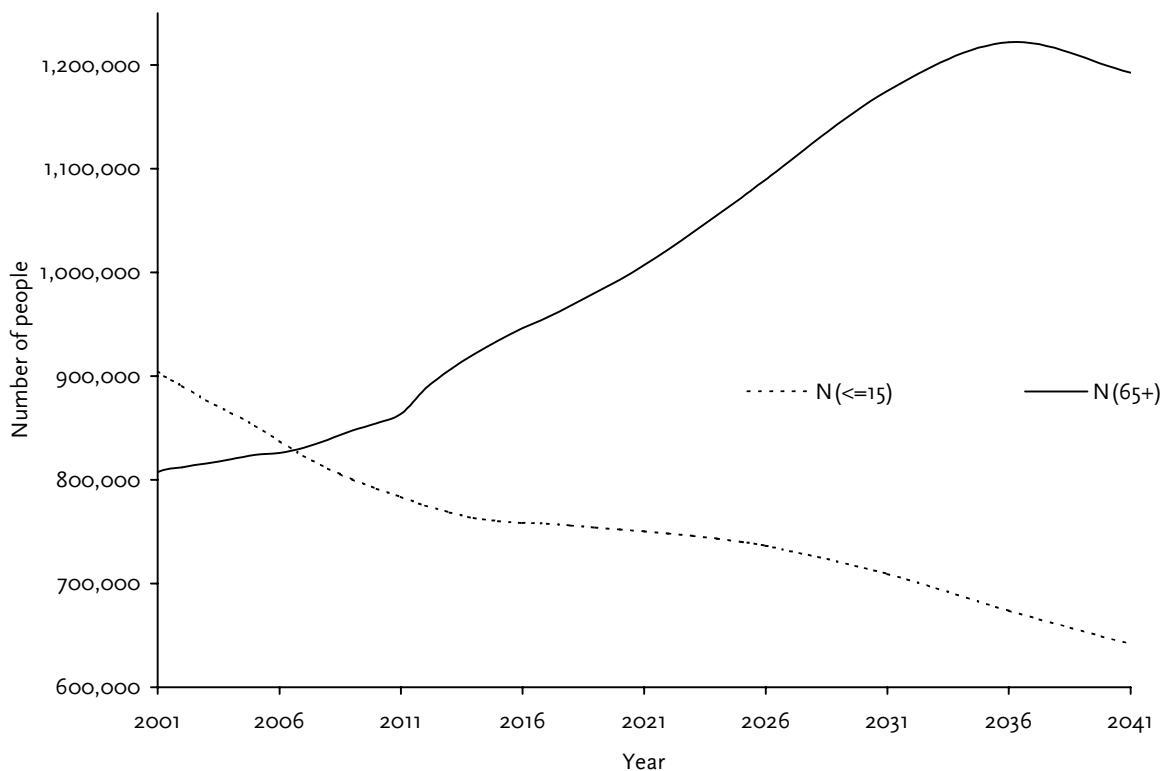
One way to summarise the extent of population ageing is to consider changes in the number and share of people in different age groups. According to the GAD’s projections, for example, there will also be a large increase in the number of people aged 65 and older and a large reduction in the number of people aged under 15. As shown in Figure 7, the number of people aged 65 and older is expected to rise from about 800,000 in 2001 to about 1.2 million by 2041—an increase of about 50 per cent. On the other hand, the number aged under 15 is expected to fall from about 900,000 to 650,000—a decrease of about 30 per cent. As shown in Figure 8, in percentage terms, the population ageing process is even more dramatic. The share aged 65 and older will increase from 16 per cent to 27 per cent of the total population while the share aged under 15 will decrease from 18 per cent to 14 per cent. Very soon, the population aged 65 and older will be larger than the population aged under 15, both in absolute numbers and in percentage terms.

4 Other demographic futures with increased net migration

It is clear that the Scottish Executive is concerned with the negative economic and social consequences of population decline and population ageing. Indeed, the First Minister, Jack McConnell, has remarked in public on numerous occasions that population ageing/decline is Scotland’s “number one problem” (see for example, McConnell, 2003a,b). If this is the case, then the obvious question is, what can be done about it?

The root cause of Scotland’s population ageing/decline is low fertility. It follows that a sustained increase in fertility would help counteract population ageing/decline. However, the amount that fertility would have to increase to in order to have a sizeable impact seems unlikely to occur, at least any time in the near future. In order to achieve the replacement level, the total fertility rate would have to increase by about 35 per cent—and stay at this level indefinitely—just to maintain the population around the 5 million mark. Such a large increase is possible but improbable given that fertility has

Figure 7 Population in different age groups Scotland, 2001-2041 (GAD projection)



declined in almost every year since 1965 (see Figure 1). A drastic reversal of what is now a forty-year trend seems unlikely, although it is worth remembering that very few demographers “predicted” the sharp increase in fertility that characterised the post-war baby boom (see Joshi and Wright, 2004).

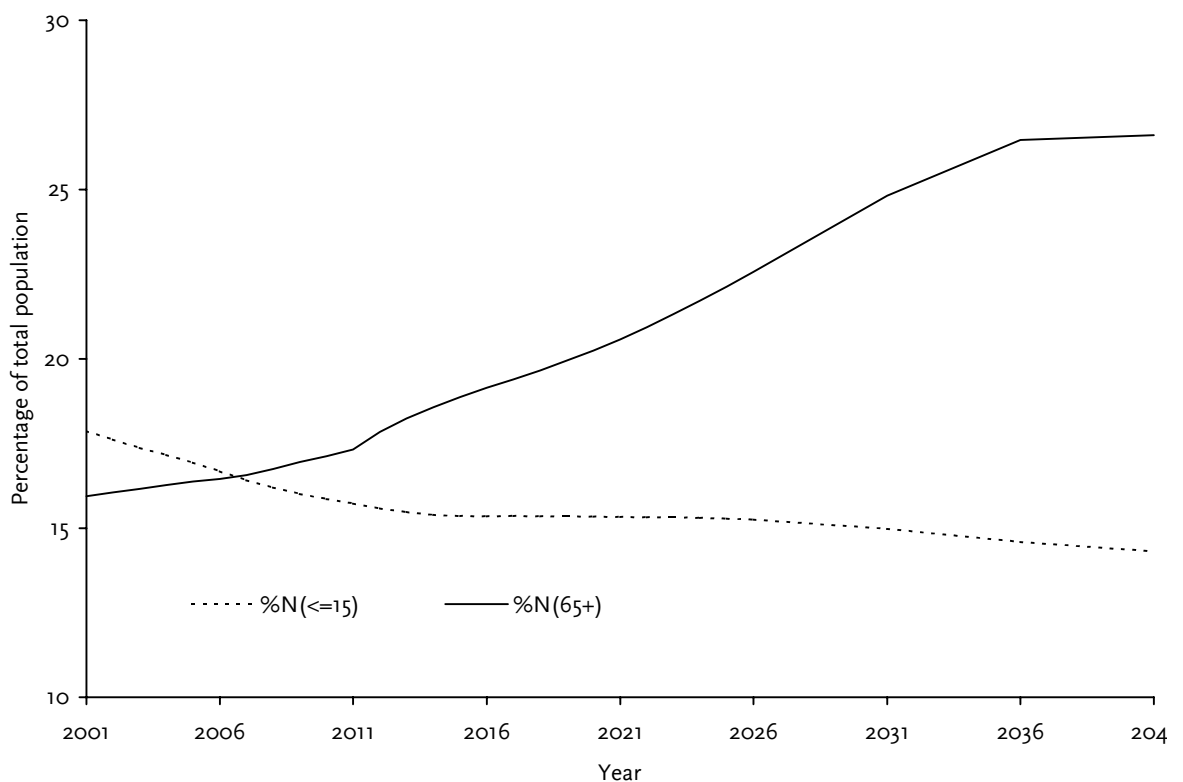
Under the assumption that we cannot expect large increases in fertility in the future, the other way in which population ageing/decline can be counteracted is through what I will term “targeted immigration”. That is, an immigration policy is adopted that substantially increases net migration by attracting young migrants to live and work in Scotland. Indeed such a policy is reflected in the Scottish Executive’s so-called *Fresh Talent Initiative*, where one of the aims is to encourage overseas students studying at Scottish institutes of higher education to stay in Scotland after they graduate through the issuing of special visas (Scottish Executive, 2004). In my view this is a step in the right direction, but as is noted below, the number of net migrants such a policy is likely to generate falls well below what is required to have a significant impact on population ageing.

4.1 Projections

How much would net migration have to increase in order to stop population decline and at the same time decelerate the ageing of the population? It is clear that increasing net migration will add people to the Scottish population and therefore work against population decline. However, increasing net migration will only have an impact on population ageing if net-migrants as a group are younger than then the general population. If the age distribution of net migrants is the same as the general population then increasing net migration will have no impact on population ageing. Therefore, the effect on population ageing will be highly dependent on the age distribution of migrants. It is perhaps interesting to note that in the GAD’s projections discussed above, the age distribution of immigrants and emigrants is assumed to be very similar, so the impact of net migration on the age distribution of the population is very small (see Wright, 2004).

In order to evaluate the impact of a successful immigration policy on population decline/ageing, a set of population projections have been carried out.

Figure 8 Population shares in different age groups Scotland, 2001-2041 (GAD projection)



These projections adopt the fertility and mortality assumptions used in the GAD’s “principal” projection—constant below replacement fertility coupled with gradually decreasing mortality. Where these projections below differ markedly to those of the GAD relates to the assumptions about net-migration. It is assumed that net-migration by 2010 increases from the current level of about zero to levels ranging from 10,000 to 50,000 per year. It is further assumed that all the net-migrants are under the age of 45, with half the number being under the age of 20. This not only implies that net migrants as a group are much younger on average than the general population, this age distribution assumption can be thought of as an approximation of a policy that successfully attracts “younger workers with children”.

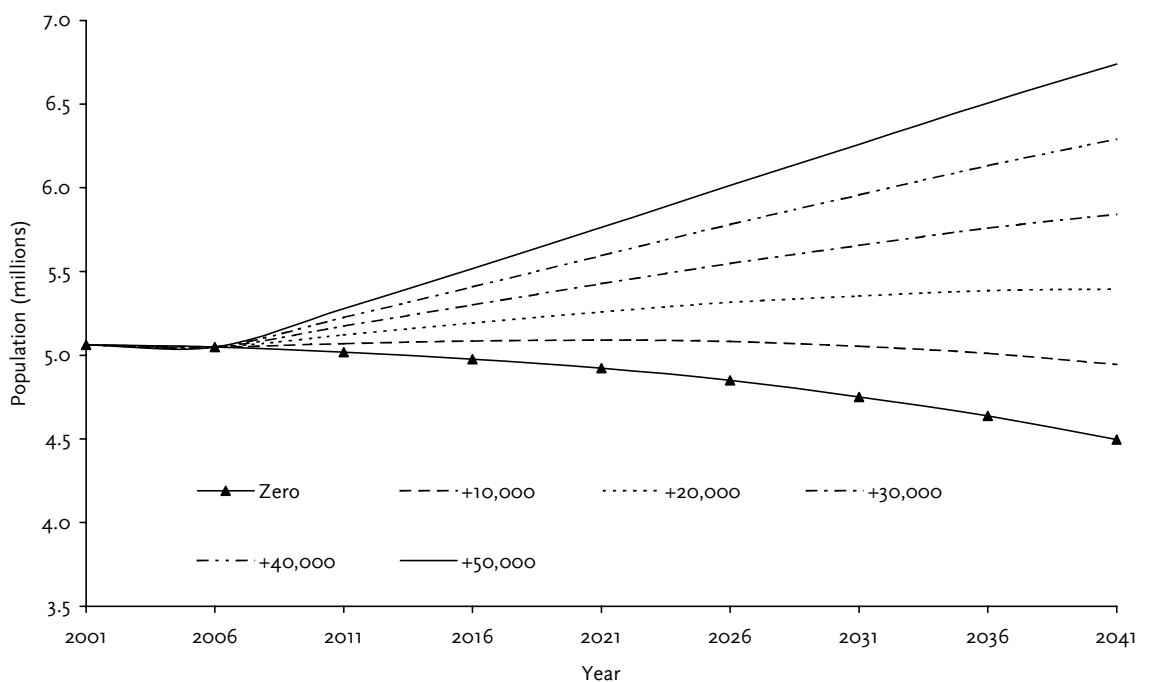
4.2. Results

The results of the projections are summarised in Figures 9 and 10.⁴ Figure 9 shows the size of the Scottish population from 2001 to 2041 based on different levels of net migration. Figure 10 shows the percentage of the population that would be in

the aged 65 and older age group. The population share in this age group is one summary measure of population ageing. Table 1 presents the estimates of population size and the share of the total population aged 65 and older in 2041, which is the last year of the projection. To provide a baseline to which the alternative scenarios can be meaningfully compared, a projection is also carried out that assumes zero net migration.

Turning first to the baseline case, the results are very similar to the GAD’s “principal projection”. Under these assumptions, the population will decline to about 4.5 million by 2041. If net-migration was to increase to 10,000 per year, then size of the population would be constant, hovering around 5 million.⁵ However, net migration levels above 10,000 per year would generate significant population growth. The baseline case corresponds to an average rate of population decline of about one-quarter of a per cent per year. Net-migration of 50,000 per year would lead to a population of 6.7 million by 2041, which corresponds to an average rate of population growth of about 0.8 per cent per year. For completeness, net migration levels of

Figure 9 Population size Scotland, 2001-2041 different net migration assumptions



20,000, 30,000 and 40,000 per year would lead to populations of 5.4, 5.8, and 6.3 million, respectively, by 2041. These values correspond to non-trivial average rates of population growth of about 0.2, 0.4 and 0.6 per cent per year.

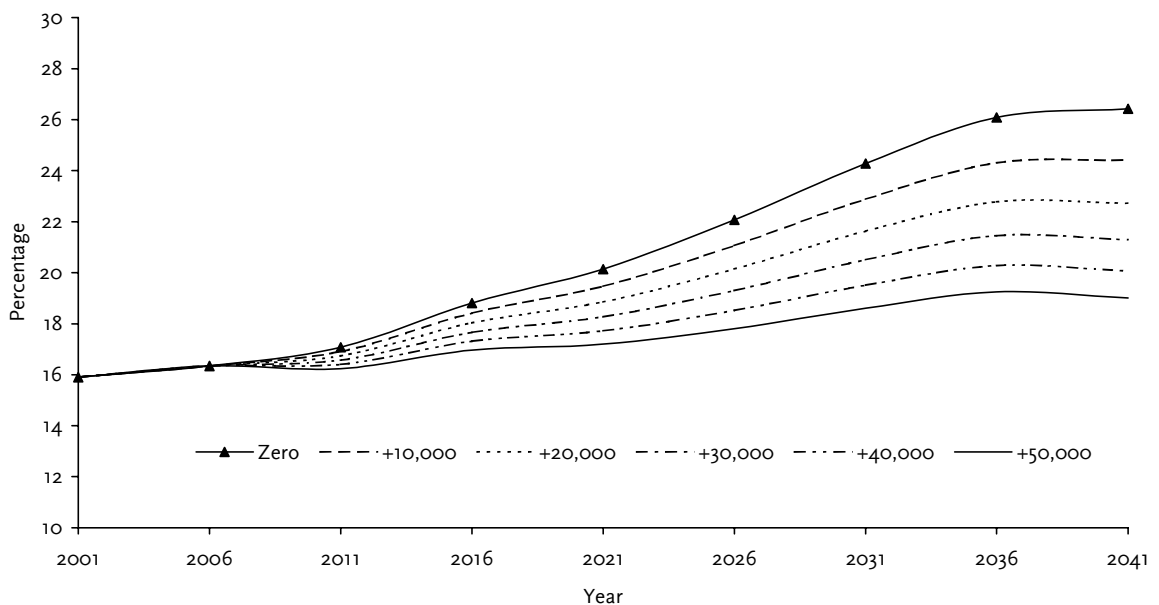
Net migration levels in this range will also have a sizeable impact on population ageing. The baseline case which assumes zero net migration suggests that the percentage of the population aged 65 and older will increase by 10.5 percentage points, from 15.9 per cent in 2001 to 26.4 per cent in 2041 (again very similar to the GAD’s principal projection). It is important to note that even a net migration level of 50,000 per year will not “stop” the process of population ageing. However, net migration with the assumed age structure described above would slow the process down. For example, 50,000 net migrants per year will lead to just over a 2 percentage point increase, with the share of the population aged 65 and reaching 19.0 per cent in 2041. The effect of 10,000 migrants per year is much smaller. Under this assumption, the percentage of the population aged 65 and older will reach 24.4 per cent by 2041, which is not much smaller

than the 26.4 per cent suggested by the zero net migration baseline projection. Net migration levels of 20,000, 30,000 and 40,000 per year suggest that the share of the population aged 65 and older would reach 22.7, 21.3 and 20.1 per cent, respectively, by 2041.

5 Conclusions and policy implications

The main conclusion of this report is that a targeted immigration policy which attracts young individuals in sufficient numbers would both stop population decline and slow population ageing. In my view, if current demographic trends continue then population decline and population ageing will lead to a sizeable reduction in the standard of living of Scottish people. Scotland is not unique in this respect, since population ageing is a feature of most industrialised nations. For example, the current economic problems in Germany clearly have a demographic dimension. The German government at all levels is being forced to adopt a series of

Figure 10 Percentage of population aged 65+ Scotland, 2001-2041 different net migration assumptions



policies aimed at radically reforming the labour market, the pension system and the health system since they simply do not have the resources to maintain the current levels of provision given their dwindling tax base. However, what is unique about Scotland is the lack of public debate and interest in the potential problems of population decline/ageing. Until the establishment of the Scottish Parliament, there was virtually no interest in Scotland's demography. It is somewhat telling that in the space of a few years, population decline/ageing has gone from being a "non-issue" to being Scotland's "number one problem".

Although the simple arithmetic of population projections suggests that immigration can stop population decline and slow population ageing, the difficult step is to put into place an immigration policy that is effective. It is clear at the moment that there is political commitment in Scotland for increased immigration. The political desire to increase immigration is one matter—having the instruments in place to turn this desire into a reality is another. Scotland needs to have what I term a "Scottish-specific" immigration policy. In this respect Scotland, can learn much from other countries. For example, Canada has a clear immigration policy which links economic needs to immigration decisions. Every year the Canadian Government produces an "immigration plan" which sets the levels of immigration for the following year (see for example, Government of Canada, 2001). Immigration to Canada is managed and once the

plan has been set it is the responsibility of the government departments to achieve the targets.

It is fair to say that the Scottish Executive's *Fresh Talent Initiative* may form the basis of what will eventually be a Scottish-specific immigration policy. Nevertheless, there is a fundamental political reality that makes establishing such a policy extremely difficult (if not impossible). Immigration is a "reserved power". Immigration policy is a matter for Westminster and is not the responsibility of the devolved governments. Although the Scottish Executive has recently obtained some "concessions" from the Home Secretary (e.g. two year visas for overseas students), they do not have instruments at hand to ensure that immigrants to Scotland stay in Scotland.

It is somewhat bizarre that the Scottish Executive warns us that population decline/ageing is our "number one" problem and yet at the same time they are virtually powerless to do anything about it. People immigrate to the United Kingdom and there is no requirement that they must locate or stay in a particular region. Without this conditionality (which is at the centre of immigration policy in other countries) then it is my view that Scotland will never be able to attract and keep the number of immigrants it needs. Although the Scottish Executive believes that it can achieve a sizeable increase in immigration working within the current system, such a view is not consistent with the reality of past experience. For example, Scotland's share of

Table 1 Population size and share of population aged 65+ in 2041 different net migration assumptions

<i>Net Migration Level:</i>	<i>Zero</i>	<i>+10,000</i>	<i>+20,000</i>	<i>+30,000</i>	<i>+40,000</i>	<i>+50,000</i>
Population size in 2041 (millions)	4.5	4.9	5.4	5.8	6.3	6.7
Percentage of Population age 65+ in 2041	26.4%	24.4%	22.7%	21.3%	20.1%	19.0%

Notes:

(1) Population in 2001 is 5.06 million.

(2) Share of population aged 65+ in 2001 is 15.9 percent

international migration in the period 1992 to 2001 was 4.7 per cent, which does not compare favourably with Scotland's share of the total UK population of about 8.5 per cent (Migration Watch, 2004). Put bluntly, under the current system Scotland does not receive anywhere near its "fair share" of people immigrating to the UK.

What can be done working within the current system in the short-run? As a first step, a new class of immigrant visa could be constructed. This visa would be conditional on the individual staying in Scotland for a least some minimum period of time. Research has consistently showed that the probability of moving declines quite sharply with the length of time an immigrant stays in a particular place. The probability of moving is quite low after about two years of residence. Therefore, for example, the creation of a five-year visa, which is conditional on staying in Scotland for this period of time, could increase immigrant numbers to Scotland. In the longer-run, the responsibility for immigration needs to be transferred to the devolved governments.

It is clear that the numbers of net migrants needed to stop population decline, and at the same time decelerate population ageing, are not small. 50,000 net migrants per year is about one per cent of the total Scottish population. It is not difficult to see that managing a migration flow of this size would present a serious challenge to the people of Scotland and their government. It is worth noting that such a number may seem unrealistically large. However, in percentage terms it is not dissimilar to the targets set by, for example, Australia, Canada and New Zealand—all countries that are committed to increased immigration.

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Endnotes

1. This section is based heavily on Wright (2004).
2. For a thorough discussion of trends in Scottish fertility see Graham and Boyle (2003).
3. For a comprehensive review of the main trends over the last century that have shaped the current demographic situation see Anderson (2004).
4. The projections were performed using the "FIVFIV" programme (see HPN Technologies Inc., 1998) which is based "cohort component projection method" (see Shorter, Sendek and Bayoumy, 1995).
5. If successful, the Scottish Executive's *Fresh Talent Initiative* is expected to attract about 9,000 migrants per year. The projection based on 10,000 net migrants provides some support for the view that this policy should prevent the Scottish population from falling below 5 million in this decade.