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Immigration or bust? Options for securing the future viability of the UK state pension system

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Immigration or bust?

Options for securing the future viability of the UK state pension system

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Abstract: As a result of population ageing and declining fertility, the UK state pension system is unlikely to remain viable in the very long run without a steady inflow of young immigrant workers from abroad. However, with prudent economic management and continuing economic growth, immigration requirements can be contained and modest real increases in pensions are a possibility. Beyond 2020, further ageing of the population will lead to fiscal pressures and the need for remedial measures such as the raising of the state pension age. Higher economic activity rates among older people, including deferred retirement, will to some extent ameliorate but not eliminate these pressures. If fertility picks up over the next few years, this will also help, but not until after 2030. Without favourable economic growth, the fiscal problems will appear much sooner and could lead to cuts in pensions or to significantly higher contribution rates.

This paper is based, in part, on written evidence presented to the House of Lords Economic Affairs Committee of Enquiry into 'Aspects of the Economics of Ageing' on 2 February 2003, 11 March 2003 and 4 April 2003. We gratefully acknowledge the comments of Steven Haberman.

1. Introduction

In 1990, there was one pensioner in the UK for every four workers. By 2030, there is projected to be nearly two pensioners for every five workers[1]. Furthermore, the projected average number of births per female in the UK, at 1.74, is below replacement rate. These two trends indicate that, if there are no other changes, the indigenous population of the UK will eventually decline. Each subsequent generation will be smaller than the previous one and this makes it much harder to sustain a pay-as-you-go state pension system without an excessive burden being placed on each future young generation. In the medium term, according to the Government Actuary, the population is actually projected to increase from 59.2m in 2004 to 64.8m in 2031 as recent demographic trends and the effects of previous baby booms reach maturity. The difference is that in 2031, 15.2m will be over 65 years as compared with 9.6m in 2004 and so we can be confident that the pension crunch will start long before any population decline.

Ceteris paribus, the supply of labour will fall relative to capital which, in turn, will raise wages relative to interest rates (the return on capital). This will encourage a substitution away from labour towards capital in the production process. The resulting capital creation (i.e., investment financed by borrowing or equity issuance) will increase capital per worker and hence increase labour productivity. The effect on total output and national income depends on whether the growth rate in productivity exceeds the growth rate in the elderly population. Unless it does, a pay-as-you-go state pension system would still not be viable. In Japan, the fastest ageing population in the world, the population is set to decline after 2020 and is already facing up to the prospect of having to drastically reform its pension system in an economy that has shown little growth in a decade.[2]

Our aim in this paper is to show that given favourable economic conditions the UK state pension system is manageable until around 2020 based on current Government policies. Contrary to popular perception, it may even be possible to provide a real increase in pensions until that time but only if it is below the increase in real wages.

[1] Government's Actuary Department (2002).
[2] MacKellar *et al* (2004).

Current Government policy is to link increases in the state pension to consumer prices but our work shows that full restoration of the link with real wages could lead to severe fiscal problems. Our study also suggests that recent increases in immigration have been a factor in raising the level of contributions to the state pension scheme. However, since this immigration is primarily a response to labour demand pressures that make the UK an attractive place to work, its effect on the state pension scheme's financial balance has been indirect. To illustrate, during economic downturns, immigration tends to decline at precisely the time contributions need to increase. If economic conditions become unfavourable and real wages do not increase at their long-run rate of 2.1% per annum, the state pension system will face serious financial difficulties in the near future.

Our work suggests that beyond 2020, fiscal pressures will build up considerably and pension increases that might have been afforded up to that point will no longer be an option without other accompanying measures such as increasing contribution rates and/or the state pension age. We also anticipate that after 2020 pressures for a significant expansion in immigration will increase to unrealistic and unsustainable levels. To some extent increases in the activity rates of older workers will reduce, but not eliminate these pressures. Although higher rates of fertility are difficult to engineer let alone predict, an increase in UK fertility rates over the next few years would be beneficial since this would help boost the contribution base in the longer term, but it would not solve the problems in the decade beginning in 2020.

To help us analyse these issues, we use a simple model incorporating projected demographic changes in the UK up until 2027 to estimate the shortfall/surplus in contributions based on a range of different assumptions about key variables. We use different policy levers to track the changes that would occur over time and compare these with current Government policy. We then identify the consequences of the different scenarios for immigration.[3]

[3] Immigration can also be used to sustain a country's fiscal policy, see, e.g., Storesletten (2000).

We make use of population projections to 2027 based on the Government Actuary's Department (GAD) 2002 single year projections. These make the following assumptions:

1. Fertility at 1.74 per woman. The rationale is that completed family size has been falling steadily from an average of around 2.45 children for women born in the mid-1930s. The family sizes likely to be achieved by younger cohorts are highly conjectural, but for this projection GAD assume that average completed family size, for the UK as a whole, will continue to decline until around the 1985 cohort and eventually level off at 1.74 children per woman.

2. The long-term unadjusted net migration assumption for the 2002-based projection was 130,000 (see Figure 1 for recent trends in net migration).[4]

3. The 2000-based and 2001-based GAD projections assumed that the annual rates of mortality improvement would converge to a common reduction of 0.75% at each age in 2025 (the 25th year of the 2000-based projections). The underlying rationale for this is as follows. The assumed improvement in mortality rates after 2002-03 is based on trends in mortality rates before 2002. Over the period 1961 - 2001, the average annual improvement in mortality rates has been nearly 1.4% for males and 1.3% for females. The rate of improvement over the latter half of this period was higher than over the first half, particularly so for males. (Interestingly, GAD notes that this appears to be partly due to differential trends in smoking behaviour between males and females.)

[4] A migrant is defined as someone who stays/leaves for at least one year. Figures in this graph are derived from the International Passenger Survey. Prior to 1991 they exclude certain categories of migration such as migrants between the UK and the Irish Republic, persons seeking asylum after entering the country and other short-term visitors granted extensions of stay. From 1991, the figures in this table include all categories of migrants and therefore represent total international migration. The table shows final revised Total International Migration estimates for 1991-2001. See 'Report: Revised International Migration Estimates 1991 to 2001' in *Population Trends* 113.

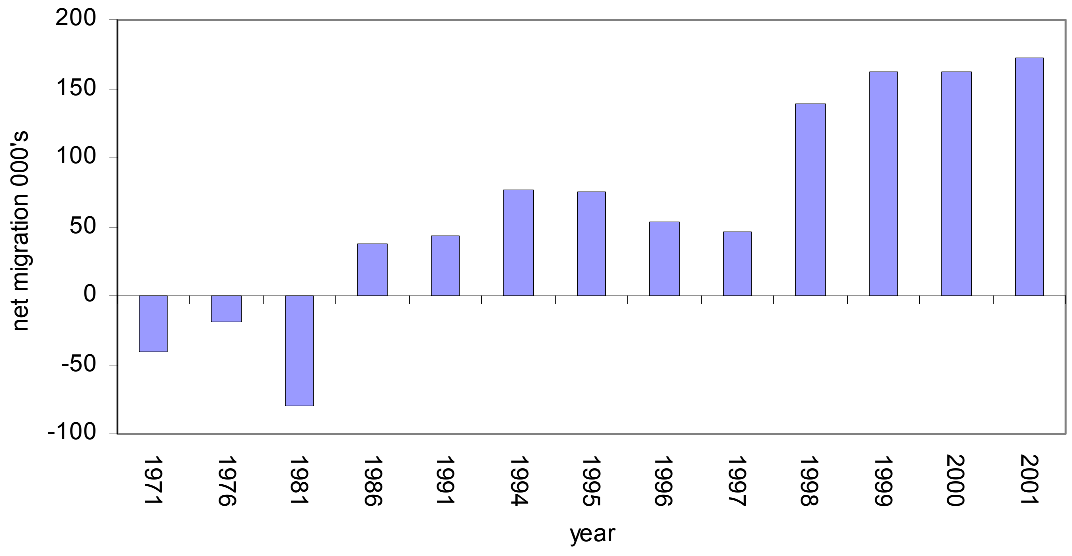

Figure 1 - Net UK immigration (all citizenships)

2. A simple model of state pension system viability

For the state pension system to be viable, there must be a balance between the revenues generated through National Insurance contributions (NICs) and the pensions paid out. We will measure any deficiency in revenues relative to payments in terms of 'contributor shortfall', which is defined as the number of person-contribution years that would be needed to balance inflow and outflow.

The policy levers for lowering any deficiency include raising NICs and the pension age or reducing the pension level, but the effects can also be ameliorated through wage increases relative to pension increases and through higher rates of economic activity. Hence the model we present can be used for analysing any of the interactions between:

- real pension levels
- pensioner numbers
- pension age
- contribution rates
- growth in real wages (arising from improved productivity)
- rates of economic activity

Shortfalls can also be met through immigration – either temporary or permanent depending on the numbers involved. As already indicated, the relationship between contribution shortfall and immigration will be indirect. We merely highlight the possibility that a sustained deficiency in the state pension scheme could be eliminated by the migration of young workers to the UK. We assume that migrants who move permanently to the UK are in their 20s or 30s and so remain under state pension age at the end of the projection period, 2027.[5]

2.1 The static version of the model

The static model assumes that there is no growth in any of the key variables. For the purposes of this study we split the population into those aged 20 to 49, and those aged 50 and above. Our reason for doing so is a response to the general observation that, in an ageing population, it is older workers who may be called upon to extend their working lives up to and beyond the current state pension age. However, it is also apparent that significant numbers of people in this age bracket become long-term unemployed, leave the workforce on health grounds or take early retirement. The feasibility of measures to encourage this group to work longer is therefore a practical consideration in judging, for example, whether more immigration is needed as an alternative.

In a PAYG system, such as the state pension scheme, the year-end balance in the pension scheme in year *t* is given by:

$$f_t = N_t p_t - y_t c_t (W_t^{\geq 50} a_t^{\geq 50} + W_t^{<50} a_t^{<50})_t + f_{t-1} \tag{1}$$

where:

$f_t =$ the shortfall/surplus in the scheme

$p_t =$ average value of the state pension

$y_t =$ average real wage

[5] This is a reasonable assumption. According to Dobson and McLaughlan (2001, Table 4) the bulk of immigrants to the UK over the last quarter century are in the 15-24 and 25-34 age groups (see also Home Office (2001)).

$N_t =$ number of people above state pension age and drawing a pension

c_t = contribution rate to the state pension scheme

$W_t^{<50}$ = population aged 20-49

$W_t^{\geq 50}$ = population aged 50 and older

$a_t^{<50}$ = economic activity rate of the population aged 20 to 49

$a_t^{\geq 50}$ = economic activity rate of the population aged 50 and older

Variables in capitals relate to populations: their values are assumed to be exogenous and derived from demographic projections. Other variables and parameters are in lower case.

We can convert equation (1) into a 'contributor shortfall/surplus' by dividing throughout by the product of the wage rate and the contribution rate:

$$s_t = \frac{N_t p_t}{y_t c_t} - (W_t^{\geq 50} a_t^{\geq 50}{}_t + W_t^{<50} a_t^{<50}) + s_{t-1}$$

where $s_t = f_t / y_t c_t$ = contributor shortfall/surplus

The contributor shortfall (+) or surplus (-) between years is given by

$$h_t = s_t - s_{t-1} \qquad (2)$$

and so the cumulative shortfall/surplus in units of 'contributor years' from year $t = 0$ (the base year for the projections) to year T is $\sum_{t=0}^{t=T} h_t$.

Equation (2) implies that sustained shortfalls or surpluses over several years could require policy changes either to the pension system itself or through adjustments to the population base brought about by migration. Most likely it will require a complex mixture of both.

2.2 The dynamic version of the model

Equation (1) does not allow for changes over time in the pension age and the growth rates in pensions, wages, contribution rates and activity rates. For reasons given above we also wish to distinguish between older and younger workers. The following equation allows for such adjustments through the use of growth-rate parameters, *i, j ,k, l* and *m* and by splitting the population into those aged 20 to 59 and those 50 or over:

$$h_t = \frac{p_0(1+i)^t N_{xt}}{c_0(1+k)^t y_0(1+j)^t} - (W_t^{<50} a_0^{<50}(1+l)^t + W_t^{\geq 50} a_0^{\geq 50}(1+m)^t) \qquad (3)$$

where:

i, j, k, l, m = growth rates in real pensions, real wages, the contribution rate, and the activity rates for individuals below 50 and aged 50 and over from base year values p_0, y_0, c_0, $a_0^{<50}$ and $a_0^{\geq 50}$, respectively

N_{xt} = the population over state pension age *x* in year *t*.

2.3 Estimating the population receiving state pension for different state pension ages

The base year for our projections is 2002. To estimate the population N_{xt} above any specified state pension age *x* in year *t*, we fit a linear regression to the population age 50 and over for each year from 2002 to 2025. It is easily shown using simple geometry that the population above state pension age *x* in year *t* is well approximated by:

$$N_{xt} = \frac{A_t}{2}(x_{mt} - x(2 - \frac{x}{x_{mt}})) \qquad (4)$$

where:

N_{xt} = population above retirement age x in year t

A_t = intercept with vertical axis from regression equation of UK population over 50 against age for year of projection *t*

x_{mt} = intercept with horizontal axis from regression of UK population over 50 against age for year of projection *t*, and interpreted as the maximum age to which anyone lives for that projection year.

Figure 2 gives examples for two years: the values for A_t and x_{mt} are 1.683m and 97.7 in 2002, and 1.946m and 101.3 in 2020. Typical values for the regression R-squared exceed 95%.[6] Equation (4) yields estimates for the population aged 50 and over of 19.6m in 2002 and 25.2m in 2020, which compare favourably with 19.8m and 25.1m according to GAD. N_{xt} in (4) replaces N_t in the static model (1).

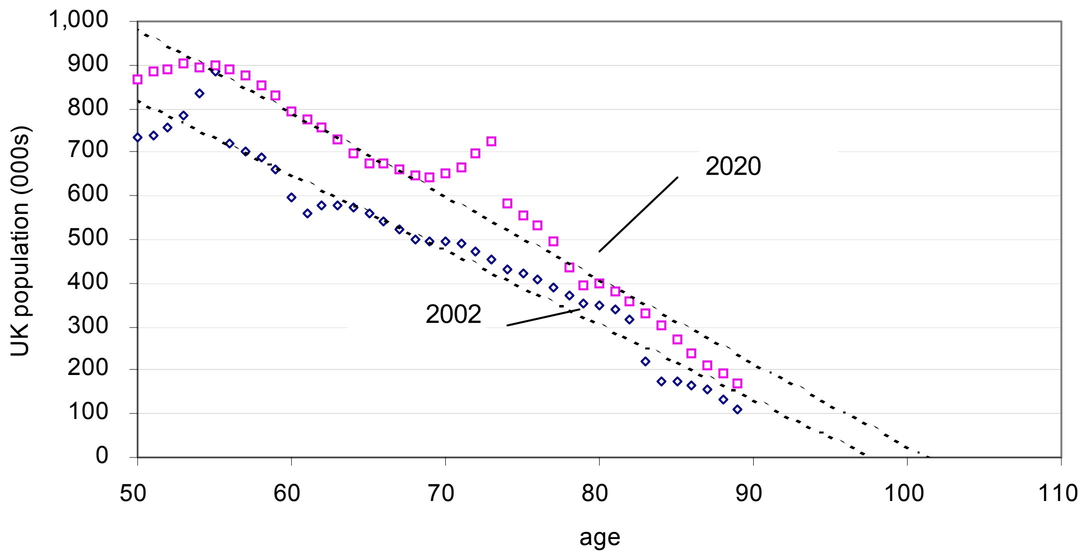

Figure 2 – Projecting populations using fitted lines from the regression of the UK population over 50 against age for 2002 and 2020

Figure 3 is a simple look-up graph based on the fitted regression model that provides an accurate estimate of the population above any specified state pension age ranging

[6] Although the goodness of fit falls to 94% for 2023 and to 89% for 2024 and 2025.

between 50 and 100 at various years in the projection period. In 2002, the official UK state pension age was 65 for men and 60 for women, which equates to a combined average pension age of approximately 62.5 years. The arrows indicate how the state pension age would need to increase in order to keep the number of pensions in payment (shown to be 11.0 million in 2002) constant over time. Based on an average pension age of 62.5 years in 2002, Figure 3 shows that this would need to increase to 71 years by 2025. The female state pension age will gradually be raised in stages to 65 after 2010, a process that is not due to be completed until 2020. In the scenarios that follow we take this transition into account.

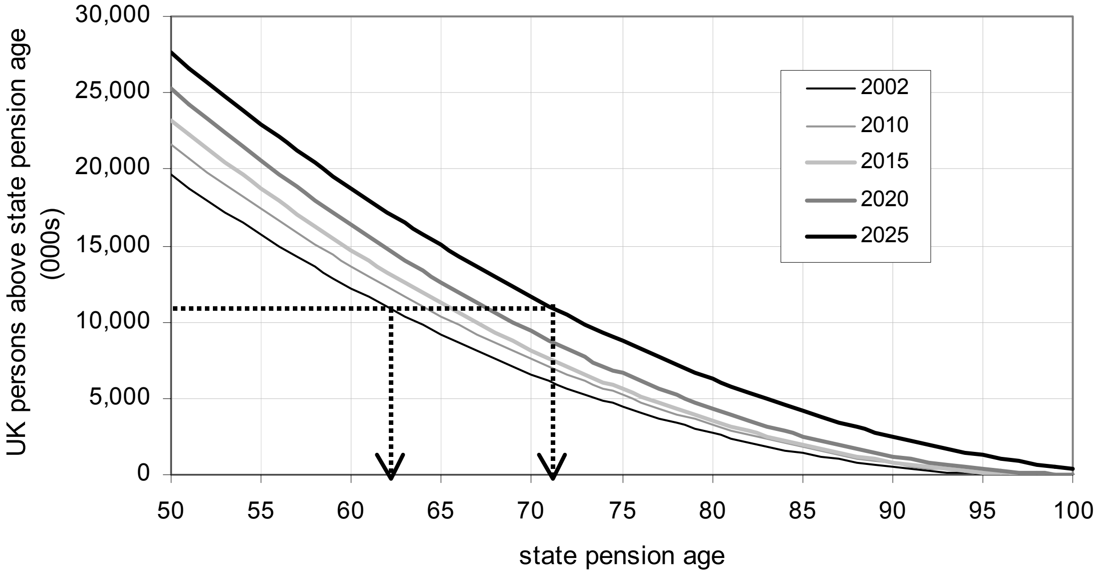

Figure 3 - UK population over state pension age in selected years to 2025

2.4 Calibrating the model

We calibrate the model using parameters taken from various official statistical sources for the year 2002:

- The average pension paid to men and women in 2002 was £3950 per year.[7] To put this figure into context a contributor shortfall of 1m persons would translate into a deficit of approximately £4bn (0.38% of 2002 GDP[8]) in the state pension fund. By the end of the financial year 2001/2002 the balance in

[7] Source: Department of Work and Pensions based on average pension in payment in September 2002

the National Insurance Fund had increased to an unusually high level of £23.6bn (2.26% of 2002 GDP)[9]. However, this cushion could quickly be expended following a persistent contributor shortfall over time or if there were a return to high unemployment, and in the projections that follow we assume the state pension system is in balance in 2002.

- The average gross wage in April 2002 was £20,474 for male and female full and part-time employees.[10]
- The NIC lower earnings limit was £89 per week or £4628 per year in 2002[11], which we deduct from average earnings. NICs finance other contributory-based social security benefits and not just pensions. Hence, the full rate of NICs not only overstates the costs of providing state pensions, but also the amounts people actually contribute due to the effect of the threshold. We estimate the cost of state pensions equates to an implied contribution rate of 9.47% based on an average state pension age of 62.5 years for men and women in 2002. This value is used as a parameter in the model.
- Figure 4 shows the economic activity rates for both the under 50s and the over 50s between 1979 and 2003.[12] Increasing these activity rates would be one way of reducing the shortfall in contributors but, as this figure shows, the scope for significant changes appears to be highly constrained if past labour market behaviour is anything to go by. In our model, we use an initial activity rate of 83.6% for the under 50s and 36.3% for the over 50s.
- Since contribution rates are applied to earnings, growth in earnings can also reduce the contributor shortfall, especially where, for example, the rate of growth is higher than the growth in the average pension. In the UK, average real earnings have increased at the rate of 2.1% per annum since 1963[13]. In the scenarios that follow we vary this figure to show how state pension finances and immigration are affected by different rates of productivity growth.

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[8] GDP at market prices in 2002 was £1,043.306bn (*Economic Tends* 605, April 2004)
[9] Source: National Insurance Fund Account 2001-2002, National Audit Office: The Stationery Office, 2003.
[10] Source: *New Earnings Survey 2002*, Office for National Statistics
[11] Source: *Inland Revenue*.
[12] Source: *Labour Force Survey 1979* onwards, Office for National Statistics.
[13] Source: *Average Earnings Index*, 1963-2004, Office for National Statistics.

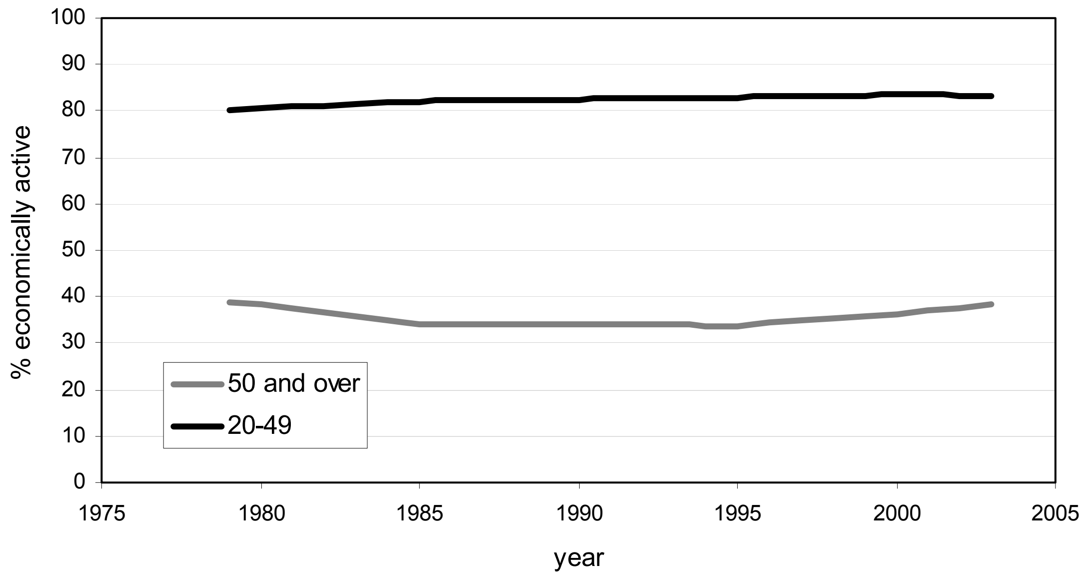

Figure 4 - Historical UK economic activity rates based on combined male and female activity rates, 1979-2003

2.5 Scenarios

In this section, we assess the consequences of five scenarios that delineate a range of possibilities and policy responses. We use graphs to show the contributor shortfall (+ vertical axis) and contributor surplus (- vertical axis) for five possible retirement ages lying between 60 years and 70 years. On the horizontal axis is the projection year starting in 2002 and finishing in 2027. To meet pensioner commitments, we assume the Government plans to maintain a balance between inflow and outflow, taking one year with another. The scenarios show what would happen in the light of various policy responses and for different assumptions about productivity growth and activity rates.

Scenario 1 – No change: No productivity growth or changes to activity rates, pensions or contribution rates from 2002 onwards.

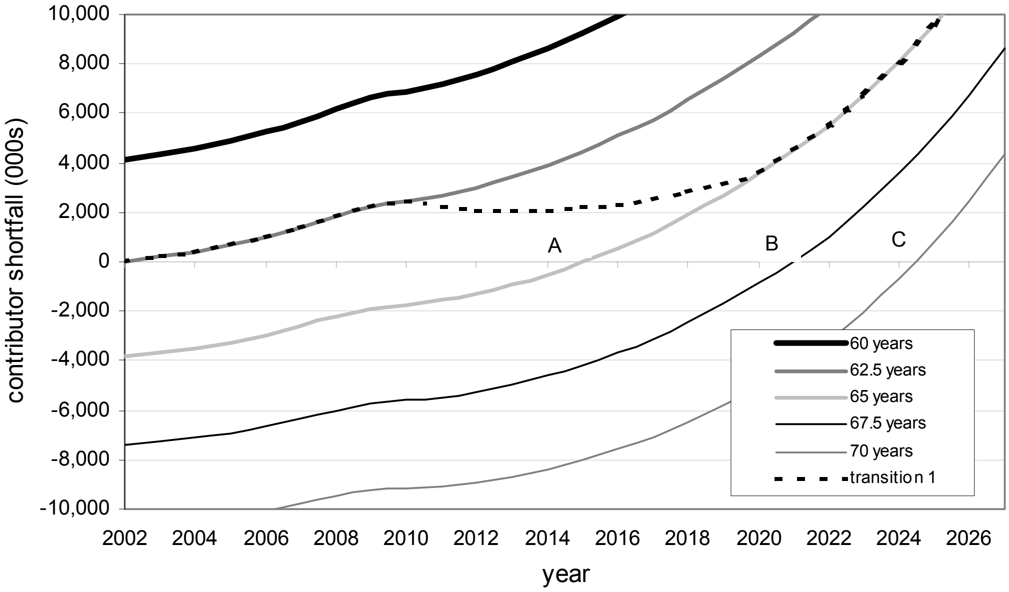

Figure 5 – Scenario 1

This scenario is equivalent to the static model in equation (1). It paints what might be described as the 'worst case scenario' since it assumes no further productivity growth and hence increase in real wages nor any improvement in activity rates. The results indicate that there would be a persistent contributor shortfall for each year from 2002 onwards, which will build into a huge deficit if it is not corrected. In order to keep the system in balance, frequent increases in the state pension age would be required, rising to 65 years by 2015 (A), 67.5 years by 2021 (B) and 70 by 2024 (C). The Government's present policy of gradually aligning the state pension age of women to that of men between 2010 and 2020 (see the dotted line in Figure 5 labelled 'transition 1') would not be sufficient to solve the problem.

Figure 5 is also relevant in the case where wages and pensions increase at the same rate. The often-heard demand for pensioners to share in the growth of the economy through linking pension increases to wages implies a huge contribution shortfall, given the UK's demographic prospects over the next quarter century.

Scenario 2 – Nothing for pensioners: Real wages increase at the historical rate of 2.1% per annum, no change in any of the other variables.

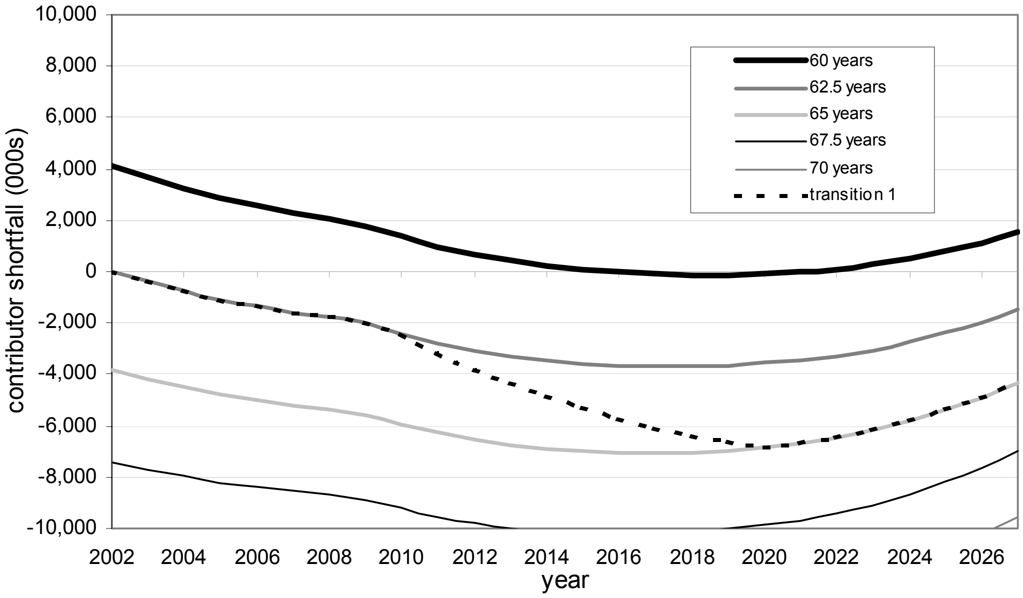

Figure 6 – Scenario 2

Scenario 2 assumes real wages continue to grow along the long-run historical trend and pensions and the other variables are held constant in real terms. The results show that a substantial surplus would build up over the projection period. On present Government policies, shown in the dotted line ('transition 1'), the rate of increase in the annual surplus would start to diminish after 2020 and the surplus itself would disappear sometime in the 2030s.

Scenario 3 – Cuts for pensioners: Real pension reduction of 1% per annum, no change in any of the other variables.

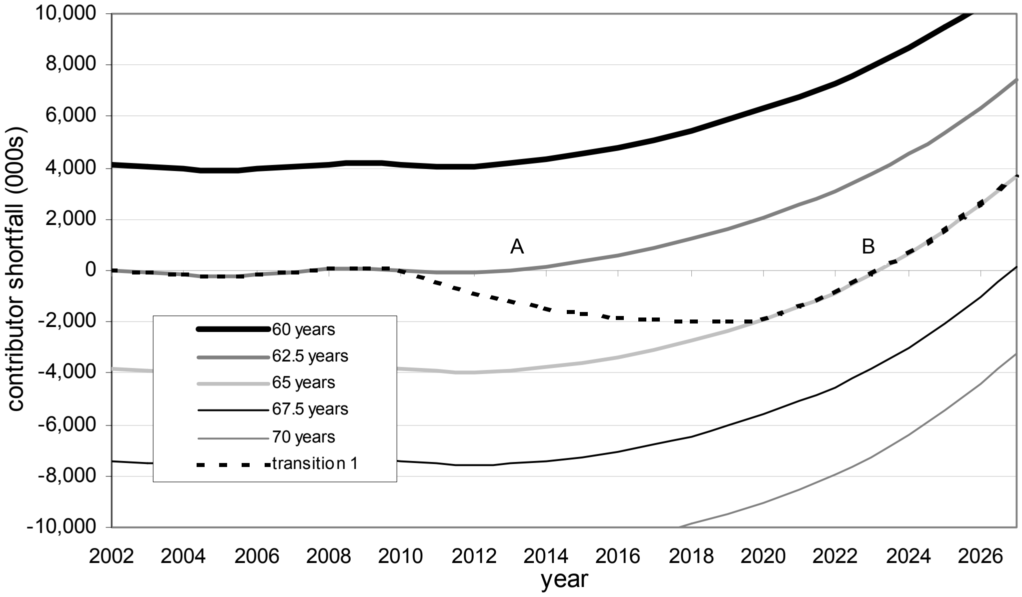

Figure 7 – Scenario 3

A 1% per annum real cut in pensions would keep the system in annual balance until 2014 (point A) assuming an average state pension age of 62.5. The planned increase in the state pension age for women to 65 ('transition 1') has the effect of keeping the state scheme viable until 2023 (point B). Indeed, there is a contributor surplus between 2010 and 2023. In theory this could be given back to pensioners in the form of higher pensions, but the annual rate of increase in pensions would have to be below the rate of increase in wages for the policy to work. There would need to be further increases in the state pension age after 2023 to maintain the viability of the system without additional immigration.

Note that in a PAYG system, a real pension reduction of 1% per annum has exactly the same effect as a real wage increase of 1% per annum or a contribution rate increase of 1% per annum.

Scenario 4 – Something for pensioners: Real wages increase at the historical rate of 2.1% per annum and real pensions increase by 1.5% per annum, no change in any of the other variables.

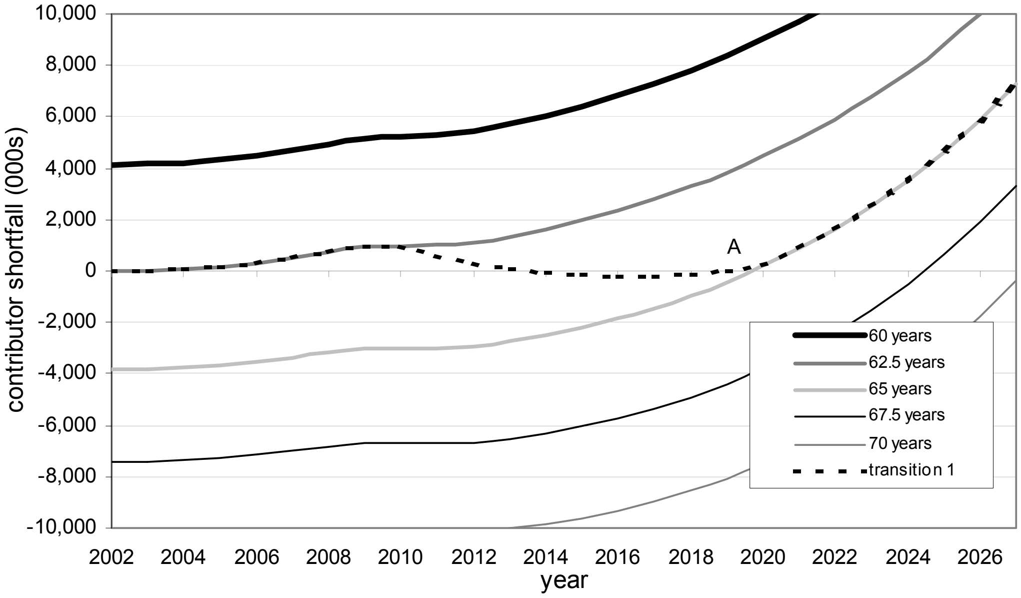

Figure 8 – Scenario 4

Under the Government's current retirement age policy, the system could provide a 1.5% per annum increase in pensions until 2020 (point A) after which point deficits would accumulate rapidly. The small hump around 2009 is caused by the retirement of baby boomers.

Scenario 5 – Something for pensioners on the one hand, something taken away on the other: Real wages increase at the historical rate of 2.1% per annum, real pensions increase by 1.5% per annum, transition to a state pension age of 70 after 2020, 0.025% per annum rise in activity rate, no change in any of the other variables

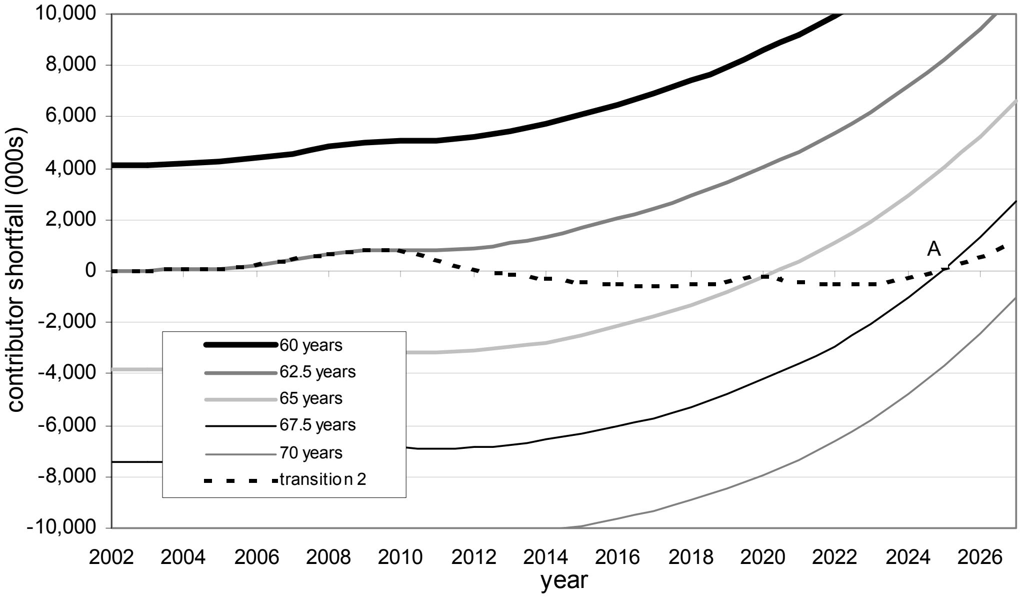

Figure 9 – Scenario 5

This scenario keeps the system in balance until 2024 after which date immigration pressures could re-appear (point A). While the increase in pensions would clearly be popular, this would be counterbalanced by the rise to 70 years in the state pension age between 2020 and 2030 ('transition 2'). The scenario also appears to be a feasible one: the activity rate for the over 50s at the end of the period would have risen to 41%, a figure seen as recently as the late 1970s, compared with 38% in 2002. Without the increase in the activity rate, the pressures would start to build up in 2022 instead of 2024.

So a combination of modest pension increases and improvements in activity rates, combined with a politically challenging increase in the state pension age to 70 could keep the UK state pension system viable until 2024 without any significant immigration pressures. Without the increase in the state pension age to 70, these pressures would begin after 2018.

2.6 Discussion

These scenarios suggest that increases in the state pension age after 2020 look more likely than not. The alternative, in the absence of any other policy changes, would be substantial and unrealistic increases in immigration. The GAD demographic projections upon which these scenarios are based assume an annual net rate of immigration of 130,000 persons a year, which, over 10 years, translates into 1.3m, and over 20 years into 2.6m extra people. Under some of our scenarios, this will need to be even higher as the following illustration shows.

The potential 'contributor shortfall' can be viewed in an alternative light by plotting changes in the dependency ratio (the ratio of persons between age 20 and state pension age to the number of persons above state pension age) between 2002 and 2025. Figure 10 shows this ratio at different state pension ages in 2002 and 2025. At point A in 2002 when the average state pension age was 62.5, the dependency ratio was 3.1. This would decrease to 2 workers per pensioner by 2025 without any change in state pension age. The same ratio as in 2002 could be maintained in 2025 if there were a permanent addition of 10m migrant workers and the average state pension age were raised to 65 (point B), or, without any further immigration, if the state pension age were raised to 67.5 years (point C). Point B requires approximately 500,000 additional migrants a year (in excess of the GAD baseline projections) in order to maintain the dependency ratio at its 2002 level.

However, the scenarios also demonstrate the sensitivity of the pension system to small changes in assumptions and so any direct translation of 'contributor shortfall' into additional immigration needs to be treated cautiously. Nevertheless, our analysis suggests that no single policy measure is capable of 'solving' the pension crisis without creating significant distortions and it is therefore probable that a range of measures involving increases in state pension age, higher contribution rates, and additional immigration will be necessary. Any package of options will also depend on future economic growth and on long-run fertility trends.

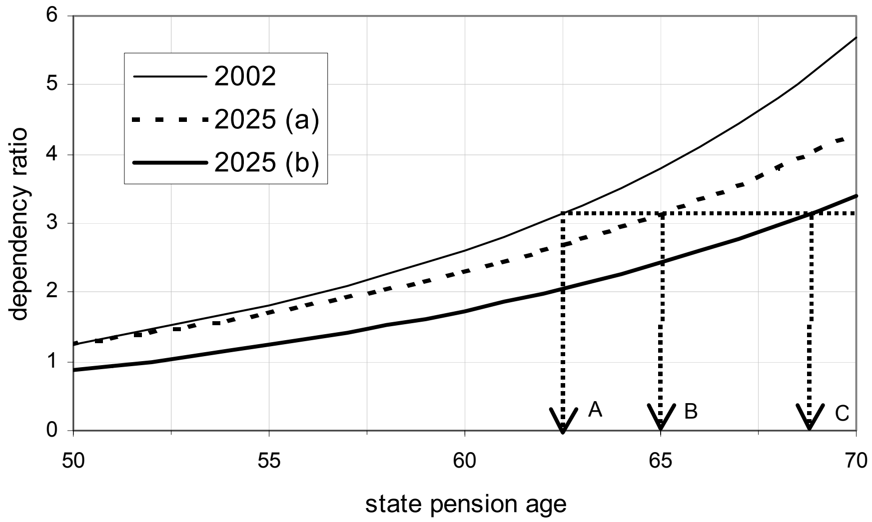

Figure 10 - The relationship between the dependency ratio and state pension age in 2002 and 2025: 2025(a) assumes an additional 10m permanent migrants and 2025(b) assumes no change from the GAD baseline.

There are other factors that need to be taken into account in a fuller treatment of this issue:

- A key assumption underlying the above calculation is that the immigration is demand-led and brings in qualified immigrants with needed skills[14]. This is the policy followed by countries such as Australia and the US and is one that has been successful in maintaining a high degree of social cohesion in a way that an influx of low-skilled immigrants who would be competing in the labour market with the incumbent workforce might not be.[15]
- The rapidly changing nature of the global economy also needs to be considered. Even key services can now be provided internationally, e.g. Barclays Bank, Prudential Insurance and British Telecom have set up call centres in India (so-called ‘off-shoring’). So, with the spread of information technology, the ‘immigrant workers’ do not necessarily need to move from their home country. We should not forget the failed attempt to save the UK textile industry in the 1970s by bringing in low-wage immigrants to the northern industrial cities.

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[14] Borjas (1995)
[15] Ben-Gad (2003)

- The impact of immigration on domestic wages also needs to be considered. Estimates from the US[16] suggest that 'an immigrant influx that increases the supply of workers in a particular schooling-experience group by 10% lowers the wages of natives in that group by 3 to 4 % and reduces weeks worked by 2 to 3 %' .
- Immigration is not an automatic pension scheme stabiliser but tends to respond to wage differentials and employment opportunities. The contributor shortfall will increase in times of high unemployment, which will tend to coincide with periods of low immigration. This suggests the potentially stabilising role of immigration and therefore the policy implications of increased immigration need to be considered over the whole economic cycle.
- Confirmation that immigration is not a long-term solution to population ageing is given in Coleman (2002, p586). He argues: 'there can be no "solution" to population ageing and low PSRs [potential support ratios, i.e., population aged 15-64 divided by population over 65] without a resumption either of the high death rates and low birth rates of the pre-transitional regime, or at least of high birth rates alone. This would generate exceptional and unsustainable population growth, bringing its own nemesis. The consequences of population ageing might—given reasonable birth rates—be ameliorated or managed by non-demographic responses, but not "solved"'. Coleman (2002, p583) continues: 'Although immigration can prevent population decline, it is already well known that it can only prevent population ageing at unprecedented, unsustainable and increasing levels of inflow, which would generate rapid population growth and eventually displace the original population from its majority position'. Wallace (2001, p36) makes a similar point: 'A new era of immigration may have begun, but current inflows cannot prevent the agequake.........A crucial point to grasp is that higher inflows would have to be sustained indefinitely. The new immigrants arriving in the 1990s will themselves age as inevitably as the existing population. So without a meaningful long term recovery in the birth rate, they too will inevitably become a burden. While immigrants do tend to have higher fertility initially, it

[16] Borjas (2202)

tends to converge on the national average and thus only helps to limit the extent'.

4 Conclusion

An ageing society which is also declining in numbers because its birth rate is too low faces stark choices if it is going to have a credible and viable pay-as-you-go state pension policy. Credible pension policies have to be time consistent, and time consistent policies cannot pass the buck to future generations (i.e., they have to exhibit intergenerational fairness). This implies that the ratio of a society's pension bill to its wage bill cannot increase systematically. If the next generation is smaller in number than the current generation, the current generation has to:

- accept a cut in its real pensions (either relative to prices or to wages) or
- contribute more whilst in work or
- work harder or
- work longer and retire later or
- accept more immigration.

Our analysis has shown that it is highly likely that demographic factors will increasingly dominate economic factors over next 25 years and beyond in the UK. Based on our model any realistic increases in labour productivity, in work effort or in pension contributions by the indigenous population will not be sufficient to compensate for the combined problems of population ageing and declining fertility in the long run. It is therefore also highly likely that pensions and immigration issues will increasingly dominate the political agenda on national resource allocation over next half century, both in the UK and, indeed, the rest of Europe.[17] [18]

[17] Many continental European countries are in a more serious position than the UK since they are ageing more rapidly and tend to have more generous state pensions. Germany, for example, will need at least three million immigrants a year and Italy at least two million to sustain their pension systems (United Nations (2000b)).

[18] Some commentators predict a turbulent future: 'The demographics of the next 30 years may be written in our stars, but the agequake will still come as an enormous shock when it erupts in earnest. Around 2020, tremours will give way to shockwaves. The agequake will hit Richter nine, shaking western economies to their foundations' (Wallace (2001, p171)). Not all commentators agree with this pessimistic conclusion, however. Disney (1996), for example, argues that there is no 'crisis of ageing' – no adverse effect of ageing on productivity. He concedes that are serious crises in pay-as-you-go social security systems and in health care programmes in developed countries, but these, he argues, have little to do with ageing.

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