Pensions and the ageing population

Alastair Jollans, M.A., F.I.A.

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Contents

This paper is dedicated to Daniel and Alice,
in the spirit of solidarity of the generations.

1. Introduction

I grow old... I grow old ...
I shall wear the bottoms of my trousers rolled.

T S Eliot

Background

1.1 The ageing population represents a major change for most of the Western world over the next fifty years or so. The change is not only demographic, but social and financial as well. We have the enormous advantage however that the change can be seen coming from a long way off, and will not burst on us suddenly and unexpectedly. There is therefore little excuse for not preparing for it.

1.2 The problem is certainly well known, although it is arguably often not well understood. In Britain, at least as far as pensions are concerned, it is often seen as much more of a problem for our continental European neighbours than for us, both because our population is ageing less fast and because we have a pension system that is largely funded.

1.3 There is also a perception that Britain has already taken action to deal with the problem. Measures such as indexation of the state pension to prices rather than wages, cutting back on SERPS, encouraging funded personal pensions, and raising the state retirement age for women, all seem to have helped to reduce the problem, or at least the apparent problem.

1.4 This paper challenges some of these perceptions. It concentrates however on the implications of population ageing for pensions. It is not concerned, other than marginally, with other possible effects, for instance on the cost of healthcare, although these too could potentially be very significant.

Actuarial involvement

1.5 Despite actuaries supposed specialism in pensions, and in combinations of finance and demography, actuarial contributions to the debate have been few and far between. Mention should be made of a paper by David Loades to the Institute/Faculty Joint Actuarial Convention at Harrogate in 1991, which covered some of the same ground as this paper. More recently, a more general paper on demography by Dermot Grenham was presented to SIAS in January 1995, and in some ways this paper builds on that predecessor.

1.6 An article in the Financial Times in February 1996 nevertheless spoke of actuaries' views on the subject dismissively, and was in part the stimulus to write this paper. It is surely time that actuaries got more involved in this subject.

Acknowledgements

1.7 There is little in this paper that is really new. I have drawn widely on existing published research, as listed in the bibliography, and in large part the paper simply draws some of this together and presents it for an actuarial audience. My thanks go to all those on whose work I have drawn.

1.8 I would also like to thank those who have helped me directly with the production of the paper, in discussing and reviewing the contents. My particular thanks go to David Blake for advice from the point of view of an economist working in the area of pensions, and to numerous of my actuarial colleagues including Peter Morgans, Tony Russell, Lee Tyrer and Chris Goodwin, as well as to my employer. The views expressed in the paper are however entirely personal, and are not necessarily shared by any of those I have consulted.

2. Mortality, Fertility and Dependency

The turtle lives 'twixt plated decks,
Which practically conceal its sex.
I think it clever of the turtle,
In such a fix to be so fertile.

Ogden Nash

2.1 The age structure of a population projected into the future, is dependent largely on two factors, the rate of fertility and the rate of mortality. Rates of immigration and emigration may also be important, and will be considered later, but are largely ignored at this stage.

2.2 Rates of mortality are to a large degree predictable. Actuaries indeed have for many years made a living out of predicting them, and for an actuarial audience it is not necessary to go into much detail on this. Predictions for the next 50 years can be made with a fair degree of confidence, indeed far more than for almost any other predictions of what will happen over the next 50 years.

2.3 These predictions are naturally based on the experience of declining mortality in the recent past. Again it is hardly necessary to emphasise this experience, but for completeness the tables below show how the expectation of life has increased over the last thirty to forty years for some of the major European countries.

TABLE 1 LIFE EXPECTANCY FOR MALES

	1960	1970	1980	1990	1994
UK					
Life expectancy at 0	67.9	68.7	70.2	72.9	74.2
Life expectancy at 65	11.9	12.0	12.6	14.1	14.7
FRANCE					
Life expectancy at 0	66.9	68.4	70.2	72.7	73.8
Life expectancy at 65	12.5	13.0	14.0	15.6	16.2
GERMANY					
Life expectancy at 0	..	..	..	72.0	73.1
Life expectancy at 65	..	..	..	14.0	14.7
ITALY					
Life expectancy at 0	67.2	69.0	70.6	73.6	74.7
Life expectancy at 65	13.4	13.3	13.3	15.1	..
EU (15 countries)					
Life expectancy at 0	67.5	68.6	70.5	72.8	74.0
Life expectancy at 65	..	..	..	14.6	..

Source: Eurostat (1996)

TABLE 2 LIFE EXPECTANCY FOR FEMALES

	1960	1970	1980	1990	1994
UK					
Life expectancy at 0	73.7	75.0	76.2	78.5	79.4
Life expectancy at 65	15.1	16.0	16.6	17.8	18.3
FRANCE					
Life expectancy at 0	73.6	75.9	78.4	80.9	81.9
Life expectancy at 65	15.6	16.8	18.2	19.9	20.6
GERMANY					
Life expectancy at 0	..	..	..	78.4	79.6
Life expectancy at 65	..	..	..	17.6	18.4
ITALY					
Life expectancy at 0	72.3	74.9	77.4	80.1	81.2
Life expectancy at 65	15.3	16.2	17.1	18.8	..
EU (15 countries)					
Life expectancy at 0	72.7	74.6	77.1	79.4	80.5
Life expectancy at 65	..	..	..	18.4	..

Source: Eurostat (1996)

Fertility rates

2.4 Rates of fertility are more difficult to predict, although they too have shown some remarkably stable trends over recent years. However, as changes in fertility take around 20 years to work their way through to the working population and around 60 years to affect the retired population, it is only the relatively short term predictions of fertility which will have any great effect on the cost of pensions over the next 50 years.

2.5 Total period fertility rates (measured as the sum of the age specific fertility rates) have shown a fairly steady decline over the last 40 years in almost all western countries. They are now generally well below the population replacement rate of around 2.1. Rates for some of the major European countries are shown in Table 3.

2.6 However this decline has been accompanied in more recent years by a move towards later childbirth (see Table 4), and part of the decline in fertility rates may therefore be explained by deferral of births. As Table 5 shows, the decline in fertility is still evident when measured by cohort, but has not yet gone so far, for those generations that have completed their reproductive career. For later generations it will continue to fall unless there is a substantial increase in the age specific fertility rates at older ages.

TABLE 3 TOTAL FERTILITY RATE

	1960	1970	1980	1990	1994
UK	2.72	2.43	1.90	1.83	1.74
FRANCE	2.73	2.47	1.95	1.78	1.65
GERMANY	2.37	2.03	1.56	1.45	1.26
ITALY	2.41	2.42	1.64	1.34	1.22
EU (15 countries)	2.59	2.38	1.82	1.57	1.45

Source: Eurostat (1996)

TABLE 4 MEAN AGE OF WOMEN AT CHILDBEARING

	1960	1970	1980	1990	1994
UK	N/A	N/A	26.9	27.7	28.1
FRANCE	27.6	27.2	26.8	28.3	28.8
GERMANY	27.5	26.6	26.4	27.6	28.2
ITALY	29.2	28.3	27.4	29.0	29.6
EU (15 countries)	28.2	27.5	27.1	28.2	28.7

Source: Eurostat (1996)

TABLE 5 COMPLETED FERTILITY RATE BY GENERATION

	1930	1940	1950 *	1960 *
UK	2.35	2.36	2.03	1.94
FRANCE	2.64	2.41	2.11	2.07
GERMANY	2.17	1.98	1.72	1.63
ITALY	2.29	2.14	1.90	1.63
EU (15 countries)	N/A	N/A	1.96	1.80

Source: Eurostat (1996)

* Projected rates are based on the assumption that future age specific rates will be the same as the most recent observations

2.7 Although the general picture of declining fertility is to be found in almost all European countries, there are some significant differences, for reasons that are not always evident. For instance the relatively high fertility rate in the Irish Republic (although below replacement level) might be explained on religious grounds, were it not for the fact that the lowest fertility rates in Europe are to be found in Italy and Spain.

2.8 It may be easier to explain the relatively high levels in Scandinavian countries, which have gone further than most other countries in the provision of childcare for working mothers. Fertility rates in Scandinavia have recovered substantially from the levels experienced in the early eighties.

2.9 In projecting forward fertility rates it is clear that some difficult judgements have to be made. Projecting forward a downward trend could very quickly lead to nil fertility and a vanishing population. It seems more realistic to assume that at some stage fertility rates will stabilise, although there is scope for considerable discussion over when and at what level.

2.10 In practice one common assumption in population projections is that fertility rates will eventually stabilise at the population replacement level of around 2.1. In particular this is the assumption in the widely used World Bank population projections (Bos *et al*, 1994). For countries where total fertility is currently below replacement, it is assumed that the rate will stay at the current level for two quinquennia and then return gradually to replacement along a linear path, by 2030. Clearly for the major western countries this implies not only a substantial rise in fertility, but to some extent a reversal of the trend.

2.11 This may seem like a heroic assumption, but it is probably as good as any other. If long term fertility rates do remain significantly below replacement level, leading eventually to a reducing population, this may provoke other balancing changes (tax incentives to fertility, increased immigration, ...?). Nevertheless it is worth bearing in mind that the picture could be worse than is indicated by the population projections most used at present, if fertility rates do not increase.

Dependency ratios

2.12 Overall it seems that we can have a good deal of confidence in projections of the age structure of the population over the next 50 years, particularly in so far as they affect pensions. Those projections show a potentially worrying picture for those of us who expect to be pensioners for much of that period.

2.13 The critical point of course is that both of the main variables affecting demographic structure, mortality and fertility, have been showing trends that point in the same direction, towards an ageing population.

2.14 The most common measure that has been used to demonstrate the nature of the problem is what is known as the dependency ratio, or more specifically the elderly dependency ratio. The exact definition of this may vary, but a common definition is the number of persons aged 65+ as a percentage of the number of persons in the age group 15-64. On a similar basis the total dependency ratio, covering both old and young dependants, may be defined as the population aged 0 - 15 together with those aged 65+, as a percentage of the age group from 15 - 64.

2.15 Projections of both the elderly dependency ratio and the total dependency ratios on these definitions are shown in Table 6 for some of the major developed countries, together with the relative growth or decline of the total population.

TABLE 6 PROJECTED DEPENDENCY RATIOS

	1995	2000	2010	2020	2030	2050
UK						
Population	100.0	101.0	102.2	103.5	103.9	102.0
Elderly dependency ratio	24.3	24.4	25.8	31.2	38.7	41.2
Total dependency ratio	54.3	54.0	52.3	58.3	68.0	71.2
FRANCE						
Population	100.0	102.2	104.9	106.9	107.8	106.1
Elderly dependency ratio	22.1	23.6	24.6	32.3	39.1	43.5
Total dependency ratio	52.2	52.8	51.2	59.6	67.9	73.6
GERMANY						
Population	100.0	100.0	97.2	94.2	90.6	81.2
Elderly dependency ratio	22.3	23.8	30.3	35.4	49.2	51.9
Total dependency ratio	46.3	46.7	50.0	57.3	75.1	81.3
ITALY						
Population	100.0	100.1	98.2	95.3	91.9	82.6
Elderly dependency ratio	23.8	26.5	31.2	37.5	48.3	60.0
Total dependency ratio	45.6	47.8	51.5	58.8	72.7	89.6
UNITED STATES						
Population	100.0	104.8	113.0	119.8	124.7	127.2
Elderly dependency ratio	19.2	19.0	20.4	27.6	36.8	38.4
Total dependency ratio	52.7	52.0	50.5	57.4	68.0	68.8
JAPAN						
Population	100.0	101.3	102.2	100.6	97.6	91.6
Elderly dependency ratio	20.3	24.3	33.0	43.0	44.5	54.0
Total dependency ratio	43.9	47.2	56.7	67.8	70.5	84.0

Source: Bos *et al* (1994)

2.16 In broad terms it can be seen that the elderly dependency ratio is expected to double from around 20% to over 40%, with even steeper increases in Germany, Italy and Japan.

2.17 Britain is affected rather less than most of the other countries, although it should be noted that this is largely because its fertility rate has not fallen as far. This may be the result of fundamental social, economic or religious differences. However it might also be because Britain is at a less advanced stage in the pattern of declining fertility rates. In this case its fertility rate may fall further, rather than starting to rise again as the projections assume. Clearly the results would be rather different on this assumption. It would be unwise for Britain to assume on this basis that it did not have a serious problem.

2.18 The position of the United States is rather unusual, principally because of the relatively high rates of immigration, although it can be seen that it has basically the same problem of rising dependency ratios, despite its continuing increases in

population. The populations of Germany and Italy on the other hand are projected to decline significantly in the middle of the next century.

2.19 Figures for the total dependency ratio are shown above, as it could be argued that an increasing proportion of elderly dependants will be balanced by a reducing number of young dependants. On the particular assumptions used there is little evidence of this, although this is largely because fertility is assumed to stabilise at replacement level. Continued low fertility would produce a fall in the proportion of child dependants, but would in due course worsen the fall in the working age population.

2.20 It also has to be born in mind that child dependants are generally less costly than elderly dependants (even if parents find this difficult to believe). Some research in the US has considered a 'needs-weighted' support ratio, allowing for the costs of education and medical care. This attached weights of 0.72 to people under 20, 1 to people aged 20-64 and 1.27 to those aged 65 and over. Overall it looks unlikely that reduced costs for young dependants will offer any significant offset to the problem of more elderly dependants.

The relevance of the dependency ratio

2.21 The dependency ratio defined in this way appears to be of direct relevance for pay-as-you-go pensions schemes, particularly state social security pension schemes. On the simplistic assumption that all people aged 15-64 are contributors to such schemes and all people 65 and over are beneficiaries, a doubling of this ratio is more or less equivalent to a doubling of the required contribution rate.

2.22 More generally though it is a measure of how many elderly people (who in economic terms are non-productive), must be supported by the productive output of the working population. In this sense it has relevance for the economy as a whole, and may also have implications for private funded pension schemes. This question is considered in more detail in Section 3.

2.23 First though it is worth asking whether the dependency ratio as defined really is the right measure for these purposes. It is clear after all that many people aged 15 to 64 are not working, at least in the traditional economic sense, and are not contributing to social security pension schemes. On the other hand at least some people of 65 and over are working. The real dependency ratio is far more complicated than this and depends on many factors including for instance the level of unemployment, the duration of education and the level of early retirement.

2.24 To some extent it will also depend on the proportion of women in the workforce. In other ways though this is irrelevant, as most women of working age are productively employed in providing goods and services, rather than dependent, whether or not they form part of the formal workforce.

2.25 Factors such as these clearly are different in different countries and also change over time. They may be expected to change in a non-random and non-independent manner, as a result of social changes, market forces or legislative changes.

2.26 It is extremely difficult to allow for projected changes in factors such as unemployment or early retirement, although it is to some extent possible to look backwards at how changes in the past have affected the real dependency ratio.

2.27 One of the few actuarial papers on the subject (Loades (1991)), showed some historical figures for the development of dependency ratios in the UK since 1901, as well as for unemployment, and for the current proportion of the population assumed to be economically active. Interestingly this showed that the total dependency ratio in 1901 was almost identical to that in 1981, the rise in elderly dependants balancing the fall in child dependants.

2.28 It would be stretching credibility to claim that this result came about from some kind of automatic balancing mechanism in society or in the economy, but it is nevertheless clear that there are some balancing forces.

2.29 Indeed over the last twenty years quite significant changes in 'dependency' have been accommodated through gradual change:

- normal retirement ages for many people have come down, although for women the retirement age for the state pension scheme has gone up;

- many people in practice retire well before normal retirement age;

- the proportion of women going out to work has increased significantly;

- levels of unemployment have risen and fallen, covering quite a wide range of variation;

- the average period of full-time education has lengthened, with increasing access to higher education;

- technological change has meant that the same level of goods and services can be produced by fewer people - i.e. in one sense the naturally supportable level of dependency has risen.

2.30 It does seem intuitively likely that there are connections between some of these changes, and that the real dependency ratio is to some extent self-adjusting. A change in one factor may lead semi-automatically to compensating changes in other factors through market mechanisms, without even any need for legislative action.

2.31 Thus rising unemployment and earlier retirement have coincided with, and to some extent compensated for, the bulge of the baby boom generation, the rise in female employment and the effects of technological change. It is impossible to identify cause and effect in this, and is possibly of little use anyway. The point is that there are a large number of variables going in to the calculation of the real dependency ratio. A change in one of them may be compensated by a change in another, rather than leading to a change in the end result.

2.32 The question then arises as to whether the changes expected over the next fifty years will be compensated semi-automatically by other changes. Will an increasing proportion of elderly people, or a shortage of people of working age, lead to lower unemployment, less early retirement, a general rise in retirement ages, or to other similar changes? None of this can be really automatic of course, but it could happen by decisions taken at individual or company level in response to economic pressures, rather than having to come about as the result of Government decisions.

3. The effect on pension schemes

Whatever actuaries may say, there is no way by which the burden of pensions can be transferred from one period to another.

Sir Samuel Brittan

Pay-as-you-go pension schemes

3.1 A lot of work has gone into examining the financial position of the principal pay-as-you-go state pension schemes in western countries, taking into account the demographic projections. Not surprisingly in view of the dependency ratios discussed above, the picture is not good. Although the details vary according to the conditions of each scheme, the general picture is not dissimilar to the picture for dependency ratios.

TABLE 7 REPLACEMENT RATES AND CONTRIBUTION RATES

	1995	2000	2010	2030	2050
UK					
Replacement rate	17.5	17.4	16.8	14.4	10.6
Equilibrium contribution rate	6.4	6.4	6.8	6.9	5.0
FRANCE					
Replacement rate	60.1	59.4	59.5	59.8	59.5
Equilibrium contribution rate	24.3	23.2	24.4	37.7	41.2
GERMANY					
Replacement rate	52.0	51.0	49.0	48.8	48.7
Equilibrium contribution rate	22.6	25.0	24.7	41.1	41.6
ITALY					
Replacement rate	53.9	55.8	55.6	53.7	50.8
Equilibrium contribution rate	42.6	45.5	40.4	61.9	68.2
UNITED STATES					
Replacement rate	38.5	37.7	35.1	36.8	36.6
Equilibrium contribution rate	9.1	8.8	8.6	15.0	15.9
JAPAN					
Replacement rate	19.6	19.8	19.2	19.5	19.3
Equilibrium contribution rate	7.7	8.7	9.3	10.8	12.7

Source: Chand & Jaeger (1996)

3.2 Table 7 above, based on work done for the International Monetary Fund, shows projections of the equilibrium contribution rate for the principal social security pension scheme, for a number of countries. This is the contribution rate required, as a

proportion of the average wage, to maintain the year-by-year financial balance of the pension system. The table also shows the replacement rate, defined as the average pension benefit as a percentage of the average gross wage. More details on the basis of the projection can be found in Chand & Jaeger (1996).

3.3 It will be clear from the trends in replacement rates that a number of countries, notably the UK, have already taken measures to reduce the future costs of their pension schemes. It will also be clear that in most cases these measures are far from sufficient.

3.4 The projected increases in contributions, of the order of 50% or more over the next 50 years, are unlikely to be either socially acceptable or economically practical, at least without considerable adverse side effects. The conclusion is that further changes of one kind or another must be made.

3.5 An alternative way of considering the problem, that will be familiar to actuaries, is to compare the present value of contributions and benefits, and to see the difference between them. Again a lot of work has been done on this, notably by the OECD, producing high headline figures for the value of the difference, in several cases coming to over 100% of GDP (OECD (1996)).

3.6 The following table shows figures taken from the OECD study, expressed as a percentage of 1994 GDP. The calculations assume a discount rate of 5% p.a., and productivity growth of 1.5% p.a.

TABLE 8 PRESENT VALUES OF PENSIONS AND CONTRIBUTIONS

	PV of pension payments	PV of contributions	Balance
UK	142	118	-24
France	318	216	-102
Germany	348	286	-62
Italy	401	341	-60
US	163	134	-23*
Japan	299	192	-70*

Source: OECD (1996)

* The balance in these cases allows also for existing assets of the schemes

3.7 A number of subsequent studies have looked at these figures in the light of the general state of Government finances, and also in comparison to the Maastricht criteria for Government debt as a proportion of GDP. As usual however the introduction of the word Maastricht into the debate has tended to generate more heat than light.

3.8 As well as the absolute size of the gap, it is interesting to look at the potential effect of various possible measures to reduce it. The following table reproduces figures from the same OECD study, showing the revised gap under different policy changes.

TABLE 9 RESULT OF POLICY CHANGES

	Balance on current policies	Cost containment policy	Later retirement policy	Targeting policy
UK	-24	-29	3	9
France	-102	-74	-15	-12
Germany	-62	-27	-8	12
Italy	-60	-6	30	26
US	-23	-3	2	31
Japan	-70	-40	-25	27

Source: OECD (1996)

3.9 The 'cost containment' policy assumes that pension spending is frozen as a percentage of GDP from 2015 onwards. In practical terms this implies cuts in benefits, except in the UK where future benefits have already been cut so far that they are expected to fall as a percentage of GDP. On average the level of cuts implied from 2015 to 2030 is of the order of one quarter of the current level of benefits.

3.10 The figures for the 'later retirement' policy assume that the age of entitlement to benefits is gradually raised to 70, with contributions paid up to 70 too.

3.11 The 'targeting' policy assumes that replacement rates are held constant, but that the proportion of the population entitled to a pension gradually falls to 30%. This would correspond to targeting state pensions on lower income groups, with those on middle to higher incomes making alternative private sector arrangements.

3.12 The IMF have carried out similar studies looking at other policy options, including the option for some countries to do as the UK has done, and link future increases in pension benefits to prices rather than earnings. In the long term this effectively reduces replacement rates quite substantially, although it does so in a way which may be less obvious than some other alternatives, and possibly therefore more attractive to politicians. Details of the IMF studies may be found in the paper by Chand & Jaeger (1996), listed in the bibliography.

3.13 Although all sorts of different combinations are possible, essentially all proposals for changes to the existing schemes come down to either cutting benefits or increasing contributions, in one way or another. Raising the retirement age in one sense does both. The proposals differ though in the extent to which the cost is borne by different generations, or by different sectors of society.

3.14 The option of raising the retirement age is already being implemented in a number of cases, and can have a very marked effect on the projections, as is clear from the table above. As well as the increase in the state retirement age for women in the UK from 60 to 65, the US is also gradually extending the normal retirement age at which a full pension is received to 67 for both men and women. For countries which currently

have both relatively low retirement ages, and a clear problem in terms of projected rises in contribution rates, this seems an obvious option.

3.15 Such a change would also be a natural response to a problem caused in part by increased longevity. It is far from obvious that gains in the expectation of life should be used entirely to extend our retirement, rather than to extend our working life. Current retirement ages were in many cases set when the expectation of life at those ages was relatively short, and the expectation of healthy life even shorter. Retirement ages set on the same basis today might be as much as 10 years higher.

3.16 Increasing the retirement age, to the extent that it does actually lead to people working for longer, also helps to avoid one rather awkward aspect of many of the other changes suggested. Solving the problem by cutting the benefits of future pensioners, as the UK has done to a large extent, does so at their expense, and may simply create a problem of poverty in old age. That in turn could lead to increased spending on means-tested benefits.

3.17 It's also possible that cutting future benefits might, by creating economic pressure on pensioners, push them back into employment, either full-time or part-time. It might therefore to some extent lead to the same result as increasing the retirement age. It is difficult to avoid the conclusion that in one way or another, future generations may have to work for longer.

3.18 This view is consistent with the work that has been done by the Geneva Association on the 'Four Pillars' approach to retirement income. This develops from an earlier view of retirement income as being based on three pillars - a state pension, a private pension from employment, and personal savings. The fourth pillar then comes from part-time employment income, and the suggestion is that this may become much more important in future.

3.19 In addition to looking at changes to their existing pay-as-you-go schemes, most countries are at least considering switching in part to funded pension provision. Before considering the effect of such a change, the next section looks at the possible effects of the ageing population on funded schemes.

Funded pension schemes

3.20 The quotation at the start of this section comes from an article by Sam Brittan in the Financial Times on 26 February 1996 - *'Whatever actuaries may say'*, he wrote, *'there is no way by which the burden of pensions can be transferred from one period to another. All pensions have to be provided from the present national income. Even funded schemes can only give rights to a share of this year's national income. They cannot transfer resources from this year to another year 40 years away. The economic reality is that today's workers pay taxes and contributions to pay for today's pensions on the understanding that the next generation of workers will do the same for them.'*

3.21 The article went on to point out that the problem could be eased by measures which helped to raise the present or future national income, for instance by improving the national savings ratio, but did not examine whether funding might help to achieve these effects. It concluded that the real direction of change should lie in improving work opportunities for older people.

3.22 The challenge was taken up by 'The Actuary' in its August 1996 editorial when Martin Lunnon wrote as follows. *'It is not true that, with funding, current workers do not pay the pensions of those who are retired: all consume what is produced by those working currently. Both funded and unfunded pension arrangements formalise the transfer of income from those working to those retired, unfunded arrangements by taxing workers and other activities and paying those amounts to pensioners, funded arrangements by giving pensioners rights to income generated from taxation (government bonds) or from commercial activity (company bonds and equity shares).*

3.23 This assertion was however attacked subsequently in the letters pages by two actuaries, one gently chiding the editor for the error of aggregation, the other virtually accusing him of being a Marxist. Essentially both letters were making the point that the output of resources is not simply the result of the input of labour, but also that of capital. If funding raises the capital stock of the economy, it raises productivity in the future, and thus earns pensioners a right to a part of that production.

3.24 Looked at like this, the problem is not how to share out a fixed pool of resources available in the future, between workers and pensioners, it is rather how to increase the total resources available. If funding does this successfully, there may be sufficient for an increased number of pensioners, without having to reduce the resources available to workers to an unacceptable extent. The biggest question arising here though is whether funding does indeed raise investment in the economy or not.

3.25 Whether or not funding really does change the nature of the problem is critical to our position in the UK. If funding is a solution, then we in Britain are left with a problem which is on nothing like the same scale as that of many continental European countries. If funding makes little difference, then we too may have a major problem to face, and one which has received much less attention than the problems of France and Italy, for instance.

Does funding raise capital investment?

3.26 At one extreme, if pension fund assets are entirely invested in government or public sector debt, which would not otherwise have been issued, it is apparent that funding makes very little underlying difference. The cost of pensions will still have to be met from taxation at the time they are due to be paid, in the same way as for a pay-as-you-go scheme. Interestingly, a large part of the widely praised Chilean pension reform worked in exactly this way. However an ageing population was not the problem in Chile, and its scheme was designed to solve other problems. It is also clear that the Chilean scheme made a huge psychological difference, and this may be one of the major advantages of funding.

3.27 In the UK a relatively small proportion of pension fund assets is invested in Government debt. However much the same point can apply to investment in equities too. If pension fund investment simply replaces other investment and leads to no increase in the overall savings ratio and no increase in capital investment, it may make little real difference.

3.28 At the other extreme, if assets go entirely to finance new productive investment, which would not otherwise have happened, then funding does produce a fundamental difference, because the total pool of resources available for consumption in the future will increase. Pensioners then have a real claim on resources, as the owners of productive capital, to rival that of workers as the providers of labour.

3.29 This still leaves a number of problems though. The first is that the potential effect on increased capital investment from funding may be largely a one-off effect during the period that the funding is building up. In an equilibrium state, funding is no longer increasing the assets available for investment to a major extent. It is then basically acting as a mechanism for transferring resources between pensioners and workers, in much the same way as a pay-as-you-go scheme does.

3.30 Taken further, in the context of an ageing population, pension funds may eventually have to realise assets, and lead to a reduction in investment. This may coincide with a reduction in the need for investment, if less capital is needed to support a smaller workforce, but it is not obvious that the effect will be as neat as this.

3.31 Then there is the problem of duration. Most capital investment probably doesn't increase resources far enough into the future to match the term of pension liabilities, and if anything the duration of the benefits from capital investment is probably getting shorter. Capital investment can be renewed, but nonetheless this seems to reinforce the point that essentially pensioners needs have to be met from current production.

3.32 In an economic sense, probably the best long term investment, which really would match the term of the liabilities, would be an investment in education for the next generation. Such an investment is however difficult to achieve under a private funded scheme, and may indeed be easier under a state pay-as-you-go scheme.

3.33 There has been a lot of research and a lot of debate amongst economists, as to whether funded pension schemes do in fact increase savings and capital investment or not. It has to be said however that no clear conclusion has been reached, and the practical evidence seems to be very mixed.

3.34 There is no room in this paper for a full review of either the theoretical arguments or the empirical evidence, but I will attempt to give at least a flavour of the arguments. A more complete review may be found in Munnell (1987).

3.35 The basic difficulty is that there are any number of second order effects which may offset the most obvious direct effects. People clearly behave in a way that offsets to some extent any changes that others may attempt to impose on them. However since you can never know how they would have behaved in other circumstances, you can never be sure what the effects have been.

3.36 Much of the theoretical work on saving has been based on the life-cycle theory, which suggests that people essentially attempt to smooth out the level of consumption over their lives. They therefore save at the periods of their lives when their income is relatively high, and borrow, or dissave, at periods when their income is relatively low. In doing so they take an overall view of their financial situation, so that they will allow for any forced retirement saving by reducing other forms of saving, or by borrowing.

3.37 The theory seems to accord in practice with the behaviour of many people, but the reality is of course more complicated. In practice many people will not have any other saving that they are able to reduce, and may have limited capacity to borrow. Other people may have savings, but may implicitly not accept that relatively illiquid pensions savings are equivalent to other more liquid savings.

3.38 Further complications come from attitudes to early retirement. There seems to be some evidence that the introduction of a social security pensions scheme, which might be thought to lead to a reduction in saving, instead encourages some people to think of retiring earlier than they other would do, and therefore to increase their saving in anticipation of this.

3.39 There is then the effect of tax incentives. For some people the higher rate of return on pensions saving will stimulate more saving, whereas others may see it as meaning that, to achieve the same desired level of income in retirement, they can reduce the amount they save. On the other hand the cost of the tax incentives may either reduce Government saving, or if other taxes are higher than they otherwise would be, it might induce further knock-on effects on personal saving.

3.40 It is extremely difficult to draw any conclusions from the multitude of different effects, but the review mentioned earlier (Munnell (1987)) does try to do so. As far as social security is concerned it concludes (in the American context) that there is little evidence that the pay-as-you-go social security programme has depressed personal saving in the past. To a large extent it probably replaced existing intergenerational transfers. As for funded pensions the paper offered the 'reasonable conjecture' that people might reduce their non-pension assets on average by 68 cents for each $1 of private pension wealth. Other papers have come to similar conclusions, if not always so precise.

International comparisons

3.41 Whether or not the funding of pensions increases saving and capital investment is an important issue for future pensions policy. Whether or not funding has increased savings and capital investment in the past, *compared to what it otherwise would have been*, is less relevant. What matters more is the actual level of savings and capital investment, because this is what determines the extent to which we, as a society, have put aside resources for future consumption.

3.42 Table 10 below shows gross saving ratios as a percentage of GDP over various time periods, including projections for 1995 - 1999.

TABLE 10 GROSS SAVINGS RATIOS

	1970-79	1980-89	1990-94	1995-99
UK				
Government ratio	3.0	0.8	-1.4	0.5
Private sector ratio	16.3	16.0	15.1	15.2
National savings ratio	19.3	16.8	13.7	15.7
FRANCE				
Government ratio	4.5	2.4	1.5	2.1
Private sector ratio	21.4	18.0	18.5	19.4
National savings ratio	25.9	20.4	20.1	21.5
GERMANY				
Government ratio	4.3	2.3	1.2	1.5
Private sector ratio	20.0	20.1	20.6	22.4
National savings ratio	24.4	22.4	21.9	23.9
ITALY				
Government ratio	-4.3	-4.4	-4.0	-1.5
Private sector ratio	30.3	26.2	22.4	21.9
National savings ratio	26.0	21.8	18.4	20.4
UNITED STATES				
Government ratio	0.9	-1.6	-2.4	-1.3
Private sector ratio	19.2	19.4	17.7	17.4
National savings ratio	20.1	17.8	15.4	16.0
JAPAN				
Government ratio	4.5	4.8	7.6	5.2
Private sector ratio	30.7	27.0	26.0	25.4
National savings ratio	35.2	31.8	33.6	30.6

Source: Leibfritz et al (1995)

3.43 Net savings, equivalent to gross savings minus depreciation, are not included here, but show substantially the same pattern. The other half of the picture though is investment, and Table 11 shows gross domestic investment in current prices, again expressed as percentages of GDP and split by Government and Private sector.

3.44 The first point that is clear from these tables is that overall both savings and investment have declined in almost every case over the last 25 years, but on the other hand are projected to increase over the next few years. The increase in part reflects a cyclical recovery from low investment ratios during the recession in the early 1990s.

TABLE 11 GROSS INVESTMENT RATIOS

	1970-79	1980-89	1990-94	1995-99

UK				
Government ratio	4.1	1.9	2.0	1.5
Private sector ratio	15.8	15.7	14.3	14.8
Domestic investment ratio	19.9	17.6	16.3	16.4
FRANCE				
Government ratio	3.4	3.2	3.5	3.5
Private sector ratio	22.1	17.7	16.4	16.8
Domestic investment ratio	25.5	20.9	19.9	20.3
GERMANY				
Government ratio	3.9	2.7	2.7	2.6
Private sector ratio	19.6	17.7	20.2	22.3
Domestic investment ratio	23.4	20.4	22.9	25.0
ITALY				
Government ratio	3.1	3.5	2.9	2.3
Private sector ratio	22.7	19.2	16.1	16.2
Domestic investment ratio	25.8	22.7	19.0	18.4
UNITED STATES				
Government ratio	..	..	..	..
Private sector ratio	..	..	..	..
Domestic investment ratio	19.8	19.4	16.6	18.3
JAPAN				
Government ratio	5.4	5.3	5.9	6.9
Private sector ratio	29.0	24.3	25.2	21.6
Domestic investment ratio	34.5	29.6	31.0	28.5

Source: Leibfritz et al (1995)

3.45 However some recovery in savings would also be consistent with the life cycle theory of savings. Over the next twenty years or so the baby boom generation will be passing through the period of life when savings should be at their highest, before reaching retirement and the period of potential dissaving. There have been several attempts to project likely future saving using generational savings models, based not only on the life cycle theory, but on other possible theories as well. For instance one dynastic theory assumes a significant effect on savings behaviour comes from the desire to pass on an inheritance to the next generation.

3.46 It has to be said that the tables above do not show any clear evidence of a positive link between the absolute levels of saving and the extent of pension funding in particular countries. If anything there seems to be an inverse effect, although this is not conclusive, and in any case says nothing about what levels of saving and investment would have been in other circumstances.

3.47 In the UK's case though, it is clear that our savings ratio and level of capital investment have been in general lower than those of the major continental countries with a high level of pay-as-you-go provision. So whatever the effect of funding has been, in practice we have put aside less resources to provide for future needs, than other countries have done. If we experience the same level of population ageing as they do, we may therefore expect in macro-economic terms, to have the same problems as they will have, if not worse. Any advantage that we may currently have,

comes not from a high level of capital investment, but from a relatively high fertility rate.

Book Reserve schemes

3.48 Book reserve pension schemes, which are widespread in Germany, but less common elsewhere in Europe, are in some ways a half-way house between pay-as-you-go and funded schemes.

3.49 From one point of view they can be considered to be very similar to pay-as-you-go schemes, since they confer a right to benefit, without that right being backed by any specific assets. Pensions still have to be paid effectively out of future revenue, rather than by sale of assets.

3.50 From another point of view however they are very similar to funded schemes, with 'self-investment' in the sponsoring company. Although self-investment is now generally frowned upon under funded schemes, this is principally because of the risk of insolvency, which is at least partly insured against under book reserve schemes.

3.51 If the latter point of view were true, we might expect to see that in Germany, which in practice has been the main user of book reserve schemes, there would be a high level of internal capital generation, with correspondingly less use of external finance. This does in fact seem to be the case, and is one of the reasons that the German stock market is much smaller than the UK market, despite the larger size of the economy.

3.52 If the argument is accepted, that funded schemes and pay-as-you-go schemes are in any case not that different in macro-economic terms, then it may be an academic point as to whether book reserve schemes are closer to funding or to pay-as-you-go. If on the other hand the principal difference between funding and pay-as-you-go is to do with the effect on capital investment, then it is worth asking whether book reserve schemes might or might not encourage real capital investment.

3.53 Since book reserve schemes effectively make capital available to the sponsoring company, regardless of whether it can use it efficiently or not, it might be thought that they would be less effective in encouraging the efficient use of capital than the market-based system of allocation of capital that underlies funded schemes. On the other hand it may be, by much the same reasoning, that they lead to higher total capital investment, albeit less efficiently allocated. In terms of deferring consumption for an ageing population, the total level of capital investment may be more important than its efficient allocation.

3.54 In practice it is extremely difficult to resolve this question, and the evidence is inconclusive. Germany has had a relatively high level of capital investment, but this will have been influenced by many other factors, and it is impossible to isolate the effect of book-reserve pension schemes.

Switching systems

3.55 Starting a pay-as-you-go scheme is relatively easy, particularly if the current ratio of workers to pensioners, and the future population trends, are favourable, as they were in the years following the second world war. It might even be thought of as a politician's dream, or more cynically as a classic political con-trick. Today's pensioners can be offered jam today, and in return today's working population can be offered jam tomorrow. There are some definite winners, but apparently no losers.

3.56 On the same argument, closing down a pay-as-you-go scheme, or replacing it with a funded scheme is extremely difficult. Since pensions must continue to be paid to the current pensioners, the working population must end up, on the face of it, paying twice over for its own pensions. There appear to be losers, but no winners.

3.57 This brings us back to the argument though as to what real economic difference funding makes. If the level of real resources available for consumption remains unchanged, and the share of the current retired population remains unchanged, then it follows that the share of the working population must be unchanged too, despite the fact that they are apparently paying two sets of pension contributions.

3.58 The question of whether funding really increases savings and investment or not, is then critical. If the launch of a funded scheme were to increase savings and investment, then the level of real resources available for consumption now would not remain unchanged, but would fall, balanced by greater resources for consumption in the future.

3.59 The theoretical arguments tend to suggest that, whatever the general effect on saving of funded schemes as opposed to pay-as-you-go, a switch from one to the other should indeed generate an increase in saving. One recent paper (Davis (1996)), after reviewing the effect of pensions on saving, concludes that a switch from pay-as-you-go to funding is ‘unambiguously likely’ to raise saving in an economic sense, when the capital market returns on funds are taken into account.

3.60 It should be noted though that the other side of increasing saving is reducing consumption. If a switch from pay-as-you-go to funding is expected to increase saving, then it is expected to reduce current consumption, at least relative to what it would otherwise have been.

3.61 This in a sense therefore is the test of whether a Government is serious about a switch from pay-as-you-go to funding, as a means of dealing with the future problems of an ageing population. It may wish to see savings rise, but is it prepared to see current consumption fall? If the Government takes other offsetting measures to stimulate consumption, or to prevent it from falling from what it otherwise would have been, then the net effect on saving may be small. It is interesting to speculate whether the measures so far taken by the UK Government to deal with the problem, pass this test or not.

3.62 The conclusion seems to be that if the problem really is to be dealt with by a switch from pay-as-you-go to funding, then the current generation may indeed have to pay twice in economic terms. It must pay once in reduced consumption to meet the needs

of the current retired population, and again in reduced consumption now to finance investment for the future.

3.63 In practice a switch from pay-as-you-go to funding would have many effects other than the possible effect on savings and investment, including no doubt various psychological effects. There is evidence that people tend to view contributions to funded schemes rather differently than contributions to pay-as-you-go schemes, and this may in turn have effects on motivation, as will any perception that they are being asked to pay twice for their pensions

The nature of pension claims

3.64 Funding also changes the nature of the rights of pensioners. A funded scheme offers a financial claim on future resources, whereas an unfunded pay-as-you-go scheme may offer a legal claim, or in some cases not even that. Strictly some state backed pay-as-you-go schemes offer no fixed promise of future benefits, they offer only the accumulation of points, whose future value will depend on future resources. They essentially offer an expectation of future benefits rather than a promise of future benefits.

3.65 Whether a financial claim is stronger than a legal claim is perhaps a moot point. Legal claims can sometimes be negated by a simple change in the law, and the ease with which the UK government has reduced claims on future pension benefits under both the basic state pensions scheme and SERPS, suggests that this may not be too difficult in at least some cases. Although there is a convention that legal changes should not generally be retrospective, it is worth noting that both in raising the female pension age to 65, and in reducing SERPS benefits, the Government effectively acted retrospectively, reducing the value of pension rights in respect of past service.

3.66 The UK has been used to a system where Parliament is sovereign and can to a large extent change the law however it wishes. Most European countries though have written constitutions, which enshrine certain basic rights, and which can only be changed by a more onerous procedure. Under such systems it may be more difficult for some legal rights to be overturned, particularly rights acquired in respect of past service. It should also be noted that, as a Member State of the EU, the UK is subject to the EU treaties, which act in much the same way as a written constitution. These already restrict to some extent the ability of Governments of the Member States to legislate to reduce 'acquired rights', and may increasingly do so in future.

3.67 Financial claims on the other hand may be reduced by other means. One obvious way is through inflation. In the UK one generation of pensioners, in the 1970s, has already discovered to its cost, that the value of funded pensions can be eroded relatively quickly through inflation. Since that time some defences have been built up to make it more difficult for inflation to wreak quite the same havoc, but it could still do a lot of damage to pensioners' living standards. Effectively it could act as an economic mechanism for reducing the share of national resources being transferred to the retired population.

3.68 There may be other such mechanisms too. For instance, one possibility is that the steady growth in pension fund investments, and particularly equity investments, has simply pushed up prices, rather than increased real capital investment. If the process goes into reverse some time in the next century, as pension funds contract, market values may fall just at the time when pensioners are wanting to realise their investments. Although increased cross-border capital flows may help to avoid this problem in any one country, it should be remembered that virtually all the major capital-providing nations will have the same problem at the same time. Effectively there may be a world shortage of capital as the increasing number of pensioners in the developed world attempt to realise their assets.

3.69 If we think in crude terms, of the claims of pensioners arising from their ownership of capital, and the claims of workers arising from their labour, then the balance of power between capital and labour may change in favour of workers.

3.70 It may be difficult to imagine exactly how economic mechanisms will achieve a transfer of resources between different groups of people. Nevertheless we should recognise that future economic resources will be brought into balance in one way or another. As Brian Reading put it, writing in the Financial Times on 7 September 1996, *'Unless a large and ageing generation looks after its own future, the time will come when there are too many pensioners and too few workers. When that happens, pensioners must be cheated or workers fleeced.'*

3.71 The same author has written at greater length on this subject in an essay (Reading (1996)), which also looks more generally at the long-run risks in funded pensions.

3.72 One factor which may become increasingly important in future is the democratic power of pensioners. As pensioners represent a higher proportion of the electorate, there will be increasing pressure on Governments to adopt policies that are sympathetic to them. This may affect the way in which pension claims are treated. As one example it may be that a country with a high proportion of pensioners will be less tolerant of high inflation. There may also be pressure to prevent discrimination against older workers. Are we heading towards an Age Discrimination Act?

4. The international view

And none will doubt but that our emigration
Has proved most useful to the British nation.

George Barrington

World population projections

4.1 The ageing population is not yet a world problem, although current trends suggest that it may become one eventually. For most of the world the much larger problem currently is the rapid increase in population. The total population of the world did not reach 1 billion until around 1800, and it then took a further 125 years to add another 1 billion. Now it is increasing at the rate of around 1 billion people every twelve years. The world population of 5.3 billion is expected to grow to over 8 billion by 2025.

4.2 Nevertheless population growth is now slower than was previously predicted, fertility having declined more rapidly, and in more countries than had been assumed only a few years ago. Mortality levels are now falling in almost all countries, and fertility is declining in most of them too, although in many cases it is still at levels far higher than in the developed world, and well above replacement level. In 1994 the total fertility rate for the world was just above 3 children per woman, and in Africa it was still over 5.5.

4.3 Current population projections (Bos *et al* (1994)) assume that fertility will decline gradually towards replacement level where the current level is higher, and increase toward replacement where it is currently lower. On this basis the world population will stabilise at under 12 billion in the 22nd century, and the problem of an ageing population will gradually spread to all countries. There is plenty of time though for things to change before then.

4.4 For the time being the problem of an ageing population, and in particular the problem of below-replacement fertility rates, is essentially a problem of the western world, or more generally the 'developed' world. It seems natural therefore to look at ways in which the developed world's problem can be offset against the opposite problems in other parts of the world.

China

4.5 There is though the interesting case of China, which on its own accounts for a higher proportion of the world's population than the entire western world. Total fertility rates in China have now fallen marginally below replacement level, to around 2.0 children per woman, although the total population is still growing rapidly.

4.6 The 'one child' policy being pursued there, if continued, will in due course produce a heavily skewed population, and a problem which could dwarf that being forecast in the West. The apparent tendency towards higher male than female births in China, being caused by the one child policy, may cause further problems in the future. The present policy in China is perhaps the largest demographic experiment ever attempted, and the consequences, if it is carried through, are far from certain. It is however beyond the scope of this paper.

Immigration

4.7 Even leaving China to one side though, there are plenty of other countries which have in some respects the opposite problem to Britain and the rest of the western world. The first and most obvious way in which the problem could be offset is to encourage emigration from those countries with a surplus of people of working age to those countries which have or will have a shortage of people of working age and an excess of retired people. There would be no difficulty in finding people willing to emigrate and willing to sacrifice a large part of the fruits of their labour to pay for the consumption of the retired population.

4.8 Political or emotional arguments that immigrants were 'taking our jobs' would hardly be relevant if our problem were a shortage of people of working age. Indeed since emigrants tend, by their self-selecting nature, to be among the most dynamic and enterprising members of any society, a new wave of immigration could be the most positive way to revive entrepreneurial spirit and prevent the loss of vigour which might accompany an ageing society. This is a process which the USA has benefited from over many generations.

4.9 It is nevertheless not difficult to see that, however desirable it may be, such a proposal would be politically extremely sensitive and probably impossible to carry through on the scale which would be necessary to solve the problem. It might be able to help towards a solution, but we must look for other solutions or partial solutions as well.

Export of capital

4.10 The next possibility then is that we can in some way enlist the excess populations of other countries to help solve our problem, without them physically moving to our country. Ideally what we would like is that, at the time when we have a large retired population relative to our working population, we can become a net importer of goods and services from the rest of the world. In this way the pool of available resources will be greater than that produced by our own working population, and so the problem is no longer one of simply sharing out what they produce.

4.11 We cannot of course expect other countries to provide these additional resources without receiving something in return. In the alternative case of immigration, the only thing we need to provide in return is the right to live in our country and become a member of our society, since this is something many would value highly and for which they would be prepared to pay a high price. If we are not prepared to accept

this price though, we must instead pay in another way. The most obvious way to pay would be for us, over the next 20-30 years, before our ageing population problem really bites, to become a net exporter of goods and services to the rest of the world.

4.12 This no doubt an implicit deal which much of the rest of the world would be more than willing to accept. In return for significant transfers of resources over the next 25 years, to those countries with a growing population, preferably in the form of investment rather than immediate consumption, we would expect equivalent transfers of resources in the opposite direction over the following 25 years or so.

4.13 The deal cannot of course be proposed in those terms, and does not need to be. It can happen quite naturally through international trade and financing mechanisms that already exist, without the need for any specifically agreed deal. Effectively all it needs is for the UK, and other countries with the same problem, to run a significant current account surplus with the rest of the world over the next 20-30 years, balanced by a deficit on the capital account, representing a net increase in UK ownership of overseas assets.

4.14 After this period we would start to realise our overseas assets, which would then enable us to finance a current account deficit, becoming a net importer of goods and services.

4.15 Whether deliberately or not, Japan seems to be following much this strategy, and may therefore be in a much better position to deal with its ageing population problem in future, than other 'western' countries. However a large part of its current account surplus has been recycled into countries which also have an ageing population, rather than into countries with the opposite problem. To that extent it may solve its own problem at the expense of making the problem of other countries worse.

4.16 The UK is far from following such a strategy. Its own savings ratio is barely sufficient to finance its own domestic investment requirements. It is therefore in no position to offer large scale net capital investment to other countries. The only way in which the UK could achieve the required transfer of resources for this strategy to work, would be by means of a significant increase in its current savings ratio.

4.17 This brings us back to the argument in paragraph 3.61, that the test as to whether the future problem is really being dealt with or not, is whether or not savings ratios increase, and by implication, whether or not current consumption falls. I see little evidence yet that Governments, either in the UK or elsewhere, have really faced up to this problem.

International versus Domestic investment

4.18 There is an argument that says that exporting capital in the way suggested would be in some way a betrayal of the next generation in our own country, on whom we will depend for our own pensions. It would be far better to concentrate capital investment in our own country, to ensure that the next generation will have the means to compete

in the global market. As it becomes easier and easier for employment to move to the areas where the cost of labour is lowest, we will only be able to compete if we have high levels of capital investment.

4.19 I suspect that this argument is largely academic. The international capital market is already far more free than the international market for labour, and capital will flow to the areas of highest return. The more likely way in which we will be able to compete is through a highly educated and trained workforce, with high levels of intellectual capital. This emphasises the point that investment in education might be the best long term investment we could make.

5. Final thoughts

'You are old, Father William,' the young man said,
'And your hair has become very white;
And yet you incessantly stand on your head -
Do you think, at your age, it is right?'

Lewis Carroll

The actuarial view?

5.1 Do actuaries have any view on this subject? Is there any specifically actuarial way of looking at the problem? Are there any actuarial techniques which can be used to cast fresh light on the problem? After all questions involving forward projections of financial commitments seem to be right in the centre of our domain of specialism. Yet actuaries have been strangely absent from the debate and have even been dismissed as not having anything useful to contribute.

5.2 Certainly many actuaries have given the impression that they believe funded pensions are the simple answer to the problem, which is largely seen as a continental European problem in any case. Cutbacks in the basic state pension scheme and in SERPS are considered to have largely removed any future problem for the UK. Indeed in the UK more actuarial attention seems to have been devoted to the problems of financing long term care, and increasing health costs, as a result of the ageing population, than has been devoted to the problem of pensions.

5.3 An alternative actuarial view of the problem was however suggested by David Wilkie, on being presented with an Institute Gold Medal in October 1995. *'The actuarial solutions to this problem are reasonably simple. If people live longer, they should retire at an age which keeps their future expectation of life at retirement constant. Alternatively, instead of the ratio of working population to retired population changing with a fixed retirement age, the retirement age should alter so that the ratio remains unchanged.'*

5.4 I am not sure that this can be claimed as a distinctively actuarial viewpoint, although the second alternative in particular fits in precisely with my own conclusions on this subject.

Conclusions

5.5 My conclusions are that there are essentially two ways of dealing with the problem of an ageing population, which may be expressed as follows:

(a) Maintaining the level of the working population, as a proportion of the total population, by people working for longer, in one way or another.

(b) Increasing the level of savings and investment, by reducing current consumption.

Alternatives which involve reducing the future income of the retired population, or raising transfers from the working population to much higher levels, do not really seem to me fundamentally to deal with the problem at all. They are simply re-expressing the problem in another form.

5.6 On this basis I do not believe that fundamentally the UK Government has yet dealt with the future problems of an ageing population, other than by the single measure of increasing the female retirement age to 65.

5.7 Most of the other measures that have been taken have been measures to reduce the future income of the retired population, and it is doubtful that these do anything really to solve the problem. All they do is to shift the effects of the problem from the future working population to the future retired population.

5.8 Measures to encourage funded pension provision are fundamentally a step in the right direction, but I am not convinced that the manner in which they have been implemented will actually lead to a significant increase in savings and investment. This is fundamentally because the political will has not been there to defer consumption.

5.9 I do nevertheless see two other bright spots in the position in Britain. The first is that I believe the problem may to some extent solve itself, without needing major Government intervention. If the problem is one of a shortage of working-age population, then economic pressures on employers will increasingly push them to employ workers from outside the natural working age population. This is most likely to mean older workers, but could also mean immigrants, or even in some cases younger workers. Similarly if the problem becomes one of reducing income for the retired population, then economic pressures on them will drive them to seek employment, beyond the ages at which they might otherwise wish to work.

5.10 One of the advantages of funded schemes over pay-as-you-go schemes is that they may facilitate the flexibility necessary for economic changes to happen in this way.

5.11 The second reason for optimism is that our fertility rates have not yet fallen to the levels seen in some other developed countries, and may never do so, particularly if action is taken to avoid this. Government action might be more useful in measures to avoid the decline of the population, than in further tinkering with the state pension scheme. This is unlikely to mean exhortations or even tax incentives to higher fertility, but it might involve the development of policies that are sympathetic to families, and perhaps particularly to working mothers.

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