

*Fiscal Studies* (2000) vol. 21, no. 1, pp. 1–63

*This is the third in a commissioned series of survey articles from distinguished academics covering the economic issues in public spending.*

# ***Public and Private Pension Spending: Principles, Practice and the Need for Reform***

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## ***Abstract***

This paper surveys the issue of public spending on pensions. Drawing on evidence from systems around the world, but particularly in Britain, we outline the arguments for different types of public and private provision of pension income and consider how far they go towards meeting the objectives of pension provision. We discuss past trends in spending and look at future projections.

*JEL classification:* H55.

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This study forms part of the research programme of the ESRC Centre for the Microeconomic Analysis of Fiscal Policy at IFS. The authors are also grateful to the Leverhulme Trust for co-funding as part of the research programme 'The changing distribution of consumption, economic resources and the welfare of households', reference number F/368/J. Material from the Family Expenditure Survey and the Family Resources Survey, made available by the Office for National Statistics (ONS) through the ESRC Data Archive, has been used by permission of the Controller of HMSO. Neither the ONS nor the ESRC Data Archive bears any responsibility for the analysis or interpretation of the data reported here. The authors are grateful to Andrew Dilnot, Richard Disney, Emla Fitzsimons, Paul Johnson and David Miles for useful discussions and comments. The views expressed, and any errors remaining, are attributable to the authors alone.

## I. INTRODUCTION

Pensions are one of the most important single items of spending in almost all developed countries. In most countries, spending is set to rise substantially as populations age and the number of retired members of the population increases. Pensions, or more broadly social security, reform is therefore at the top of almost every government's policy agenda.<sup>1</sup> Indeed, a number of countries are already embarking on substantial reform processes which have meant that there are now a variety of different approaches to the problem of how to deliver retirement income to the elderly. What distinguishes Britain from most other countries is that the future costs of public pension provision are not projected to increase markedly, since past reforms have already reduced the generosity of future benefits for today's workers. A further side of these reforms — the offering of private pensions — has meant that there is already a substantial mix of private and public pension provision in the British system. Hence it is a natural country in which to survey the arguments for and against various types of pension provision.

This paper aims to survey the arguments relating to the public and private provision of retirement income, to illustrate some of the main features and approaches of current systems (both in the UK and elsewhere) and to outline the arguments relating to the need for, and the potential direction of, reform. Inevitably, however, such a survey can only be incomplete and many issues will have to be omitted or dealt with only briefly. Fortunately, however, unlike many other items of public spending, there is a huge literature on pension provision — both public and private — to which we are able to refer the interested reader. The debate does not, however, have a balanced international focus. In particular, there are a wealth of papers and volumes outlining and debating options for the US system and it is difficult to provide a survey of the literature without focusing on the issues particularly important in the US situation.<sup>2</sup> Such issues

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<sup>1</sup>Throughout this survey, we use the term social security loosely interchangeably with public pensions, as does much of the international literature, i.e. to broadly refer to government provision of income to the elderly. Many of the issues of the design of public pension systems carry over into other social security benefits, and it is certainly true that the system should be considered as a whole rather than piece by piece. In the UK, pensions spending makes up around half (49 per cent) of social security spending, with the rest being sickness and disability benefits (26 per cent), unemployment insurance (6 per cent) and benefits to the family (18 per cent).

<sup>2</sup>A number of the more recent volumes on US reform options draw on international comparative evidence in the form of descriptive papers outlining particular countries' experiences with the system they have in place. Such international comparative studies have become particularly important in the case of pensions policy, probably because of the peculiar difficulties raised in the evaluation of policy options using domestic data alone. Such evaluations would either need a structural model to predict pension saving and labour supply behaviour, or need to draw on experimental evaluation evidence and pilot studies, to predict the effects of reform. There are problems with both of these methods. In the first case, there is debate about the relevance and performance of the models of intertemporal spending and saving decisions that would lie at the heart of this approach to pension policy evaluation or selection, and the models themselves do not often deliver strong enough predictions to provide a firm basis for a particular policy intervention. In the second case, evaluation of policy

tend to relate to the impact of reform on national and individual saving and wealth accumulation. In contrast, the European debate tends to be more focused on the costs of existing systems, the redistribution they achieve and the impact of reform on both these factors. To some extent, a survey such as this cannot help but reflect this imbalance in the literature.

We begin our introduction by giving a brief discussion of the reasons that pension spending is projected to increase in the future, and hence why the subject of pension reform has become such a major policy issue. We also focus briefly on the implications of such trends for the measurement of the fiscal position and liabilities of the government budget. Although these two issues are not directly the subject of this survey, they provide a vital context within which to interpret the issues we discuss later.

In Section II, we consider the economics of pensions and the particular contexts in which reform is discussed. Potential market failures in the private market for pension saving are highlighted, along with both paternalistic and redistributive motives for having a public pension system. We go on to consider options for design of such systems. These can broadly vary in three dimensions — the way contributions accrue into future benefits, the conditions and form in which benefits can be received, and the agency that administers the scheme. A number of distinctions — public versus private, funded versus unfunded and defined benefit versus defined contribution — that crop up repeatedly in the menu of policies for analysis are examined. We look at what various analyses have shown to be the impact of different designs, focusing on three properties of the pension system — redistribution, insurance and risk pooling, and incentives. Finally, we examine broad classes of options for reform and assess any similarities between their approaches.

In Section III, we look specifically at how the UK system operates and consider some of the historical context in which the pension system has evolved. We look at the generosity of the UK state pension system and how the general direction of reforms over the last 20 years compares with that seen elsewhere. We also look at the way in which current public pension spending is distributed across the population, documenting the resulting incomes of today's pensioners. In particular, we focus on the mix of public and private provision, in terms of the system parameters, system structure and the resulting incomes among those who

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experiments is made difficult by the long time-lags involved, since pension policies will have their effects over the entire lifetimes of individuals. Short-run experimental evidence can be obtained, and we describe some below, but extrapolating the conclusions of these studies either to the long run, or to the economy as a whole when the general equilibrium effects are probably substantial, is, once again, controversial. Hence considering the experiences of other countries, where policies have already been introduced and real data are being collected on their effects, has become an important tool in informing the pension policy debate. A good recent example of this approach is Gruber and Wise (1999), who exploit detailed international microeconomic evidence to generate variation that is used to evaluate the incentive effects of public pensions on retirement choices.

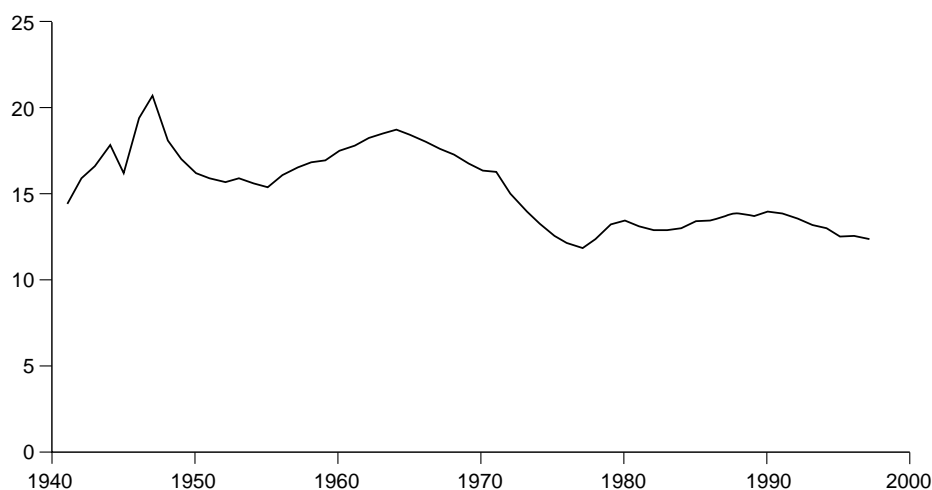
have already retired. As part of this analysis, we look at annuity income, which will become increasingly important as more individuals retire with mandatory annuitised pensions. We also look at the implied future liabilities of the UK pension system compared with those seen elsewhere and discuss possible future reforms. Section IV concludes.

*Public Pension Systems: Rising Costs and a Need for Reform?*

The reason public spending on pensions or social security is set to become more important over time is now well known. Put simply, the number of workers relative to the number of retired is projected to decline, and hence, given the current structure of most countries' public pension systems (where today's workers pay the pensions of today's retired), cost projections rapidly increase over the next 40 to 60 years.

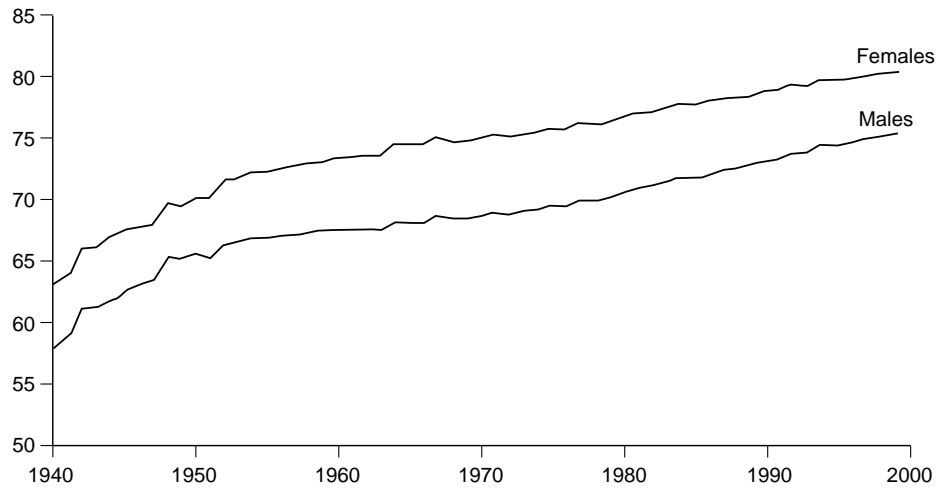
The first reason behind these projected cost increases is the pure demographic trends facing developed countries. The fact that birth rates have declined and life expectancies have risen means that populations will have much higher dependency ratios (the ratio of retired individuals or households to those of working age) in the future. Figures 1 to 3 show how these trends have interacted for the UK over the last 60 years, and how the dependency ratio is projected to change over the next 60 years. The baby boom of the mid-1960s is clearly visible in Figure 1, with the birth rate rising from 15/1,000 to 19/1,000 over a period of

FIGURE 1  
**Crude Birth Rate: Live Births per 1,000 Population, UK**



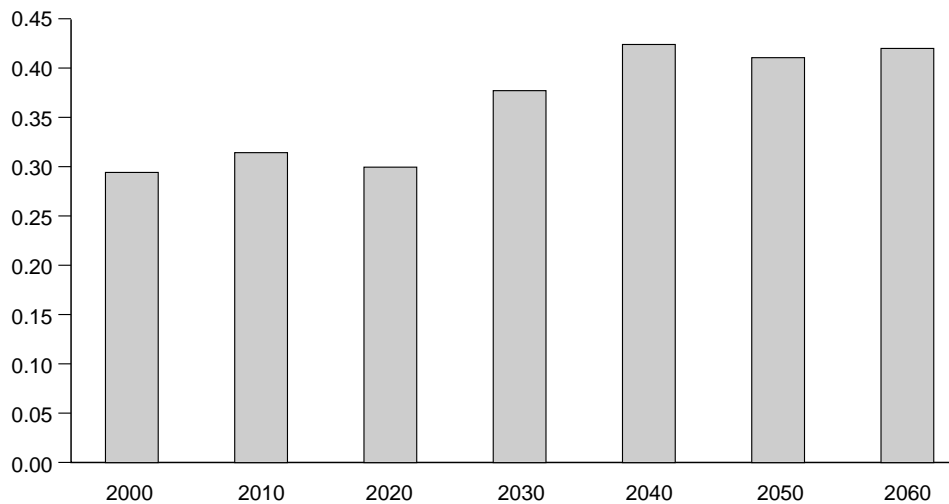
Source: *Population Trends*.

FIGURE 2  
**Life Expectancy at Birth by Gender, UK**



Source: Social Trends dataset, Office for National Statistics website.

FIGURE 3  
**Projected Dependency Ratio: Number of Retired as a proportion of Number of Working-Age Adults, Great Britain**



Note: State retirement age taken as 65 for men and 60 for women for 2000 and 2010; 65 for both thereafter.  
Source: Government Actuary's Department, 1999.

TABLE 1  
International Trends in Dependency Ratios

	Dependency ratios		
	1960	1990	2030
Canada	13.0	16.7	39.1
France	18.8	20.8	39.1
Germany	16.0	21.7	49.2
Italy	13.3	21.6	48.3
Japan	9.5	17.1	44.5
Sweden	17.8	27.6	39.4
UK	17.9	24.0	38.7
US	15.4	19.1	36.8

Note: In this table, dependency ratios are the ratio of the population aged over 65 to the working-age population.

Source: Bos, Vu, Massiah and Bulatao, 1994.

10 years, before falling back to current levels of around 12/1,000 by the mid-1970s. Coupled with the steadily increasing life expectancies for both men and women shown in Figure 2, this has meant current projections show that, by the year 2040, if retirement ages remain the same, the dependency ratio will have risen to above 0.4, i.e. two out of every five adults will be retired (see Figure 3).

Table 1 shows long-term trends in dependency ratios across a number of countries. What is immediately clear is that all populations are ageing, and that projected increases between 1990 and 2030 will dwarf the increases experienced over the period 1960 to 1990.

Also clear from Table 1, however, is that the UK projection — an increase of just over 60 per cent — is relatively small compared with some countries, which experience increases of between 90 per cent (France, US) and 160 per cent (Japan) over the 40-year horizon. These particular comparisons are obviously sensitive to the precise choice of year, given that baby booms and life expectancies do not move in an international synchronised way. For a more detailed analysis on a wider set of countries, see World Bank (1994). The general conclusion remains, no matter what comparison points are used. First, all developed countries are ageing and facing marked increases in dependency ratios. Second, the increase in the UK is at the lower end of the international scale.<sup>3</sup>

<sup>3</sup>The ageing of a population has implications for public spending items other than just pensions. Health spending and spending on other parts of the social security system (such as disability or invalidity benefits) will presumably also increase as the proportion of the elderly rises, with the key issue being the degree to which the ageing of the population is 'active' or 'healthy', as opposed to 'unhealthy' (when the stress placed on retirement and health systems would be much greater). In what follows, we do not talk at much length about these issues, but rather focus almost entirely on the pension system. On the one hand, the issues raised by the study of pension finance with ageing populations carry over fairly straightforwardly to other parts of the

However, the increases in projected public pension costs as a result of the pure ageing of the population could be amplified if there are non-demographic factors that reduce further the ratio of workers to non-workers — for example, potential labour market trends. Increasing prosperity will change labour market economic outcomes: as societies become richer, they most likely choose to consume more leisure. On the other hand, life expectancies are simultaneously increasing, with the result that resources have to be spread over more periods, an effect that will offset the increasing wealth of individuals from economic growth and increases in real living standards. In addition, migration patterns, the increasing participation of women in the paid labour force and the extent to which increased life expectancies are positively associated with the extension of healthy (and hence potentially productive working) lives will all change the ratio of workers to retired, and hence, given the design of most current systems, change the projected future costs of public pension provision.

Since, short of natural disasters or other major population shocks, the ageing of the population is inevitable, the two sets of factors that will affect estimates of the future costs of pension provision, and hence current liabilities of social security schemes, are the potential labour market trends outlined above and the design of the scheme itself. The policy debate predominantly concerns the latter and we will focus on it in what follows, but the above discussion makes it clear that the future liabilities of public systems, even given their current design, are far from certain, and that the options and the need for reform should always be seen within the context of the changing labour market.

To some extent, the ‘worries’ about increasing dependency ratios relate to more general issues than just pension systems. The trends, if taken at face value, suggest that, in the future, a smaller share of the population will potentially be engaged in productive activity. The particular ‘problems’ of financing public pension schemes in this scenario are just one manifestation, albeit a very visible one, of the more general trend. Seen as such, however, it also becomes clear that sufficient economic growth could make the productivity of the working population increase sufficiently to offset the falling proportions of productive members. Table 1 shows, however, that such effects of economic growth and changing labour force participation would have to be particularly strong in the future, given the acceleration in population ageing predicted over the next 40 years or so.

The spiralling projections for future costs of pensions mean that, as far as measuring public spending goes, the analysis of social security or pensions policy immediately highlights the deficiencies of looking at the current account surplus or deficit as a way of understanding the financial liabilities of the

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welfare state. On the other, however, it must be remembered, particularly, that receipt of healthcare and invalidity, sickness and disability benefits can, to the extent that they are correlated with retirements, exacerbate any incentive problems within the system.

government. As pointed out by Auerbach and Kotlikoff (1987), an accurate evaluation of the government's fiscal position ought to reflect committed future liabilities, and, in the case of some pension systems, these liabilities will be substantial as the population ages. To address this, Auerbach, Gokhale and Kotlikoff (1991) proposed that fiscal positions should be analysed using 'generational accounts', which take into consideration projected future tax receipts and spending commitments. The relative merits of the calculations and assumptions needed to create such a set of accounts have been debated elsewhere (see Auerbach, Gokhale and Kotlikoff (1991 and 1994) and Kotlikoff (1992), but also Haveman (1994) and Congressional Budget Office (1995); or Cardarelli, Sefton and Kotlikoff (2000) and Banks, Disney and Smith (1999) for an applied UK perspective). There seems no doubt that it is the right way to think about the aggregate implications of government pension policy and the potential effects of reforms.<sup>4</sup> One way to analyse options for pension policy would therefore be to use such a generational accounts framework explicitly. Since accounts are being computed for an increasing number of countries, both in Europe and elsewhere (see Kotlikoff and Liebfriz (1998)), this is becoming an increasingly viable approach for certain types of policy analysis. In this paper, however, we take a different approach, since we are interested not in the effects of a specific reform in a specific scenario but instead in more general issues. Therefore the next section sets out the economic issues in pension provision and discusses the broad policy raised.

## **II. THE ECONOMICS OF SOCIAL SECURITY**

In this section, we look at the arguments that have been put forward relating to the economic issues surrounding the provision of economic resources to the elderly, and at the aims that such a system could or should attempt to meet. These issues are now well known within the literature, but we include them for completeness and to provide a context within which to interpret the applied policy analysis in Section III. As a result, our exposition draws from a number of classic studies of the economics of social security without necessarily referencing them on a point-by-point basis. Readers interested in more detail on these design issues would be well advised to look at the original work of Samuelson (1958 and 1975), Aaron (1966 and 1982), Feldstein (1974), Diamond (1977), Diamond and Mirrlees (1986) and, for an applied UK perspective, Dilnot, Kay and Morris (1984). Other more general texts with useful summaries

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<sup>4</sup>The full generational accounts analysis includes projected spending on all items. For pensions, the framework is particularly appropriate since the future commitments of the government are made explicit in the pension policy of the time. This is not necessarily the case for future spending on items such as health or education, where commitments discounted for up to 50 years are less meaningful. As well as this issue, much of the debate on the generational accounts themselves has focused on the disaggregate question of the extent to which it is possible to decompose the future liabilities into the net benefits or liabilities faced by individual generations.



and discussions of the issues raised here are Barr (1998, ch. 9), Myles (1995, ch. 14), Stiglitz (1988) and Rosen (1995). More recently, a number of edited volumes, in particular Sass and Triest (1997), Arnold, Graetz and Munnell (1998) and Feldstein (1998), provide a modern debate on the options for social security reform as well as good international comparative evidence.

### *1. Aims*

A pension system essentially ensures the delivery of income to elderly households in their retirement. To ask why there are reasons for government to intervene in this activity is to ask why the outcomes of individual or household decisions are currently suboptimal, either for individual agents or for society as a whole. This in turn leads to three possible rationales for a social security system:<sup>5</sup> (a) market failure is leading to individuals not having the opportunity to (efficiently) provide retirement income for themselves; (b) there is a paternalistic concern that individuals are not choosing to save enough, even though they have the appropriate opportunities; or (c) society as a whole would be better off if there were some redistribution of resources towards those not rich enough to provide adequate retirement income themselves.

It is fair to say that there is consensus that these three rationales, taken together, provide a genuine basis for government intervention in pensions and social security policy. Where there is perhaps less consensus is in the relative importance of each of the three reasons for intervention. Since each will affect the way in which the efficiency and design of a pension system should be evaluated, we discuss each, briefly, in turn.

#### *(a) Market Failure*

Potential market failures could take a number of forms. Diamond (1977), writing from the US, points to three potential candidates — the lack of safe investment opportunities offering a reasonable return, the absence of real annuities and the problems of insuring risks associated with varying length of working life — although points out that the reason for the lack of indexed investment opportunities is somewhat puzzling. The existence of both indexed government bonds and real annuities in the UK goes some way towards diminishing the first two of these three potential market failures, and indeed removes the puzzle regarding the existence of opportunities for indexed investments. There is some evidence, however, that, despite the possibility of real annuitisation, only a minority of annuities in payment are of this form (see Finkelstein and Poterba (1999)), although this is less puzzling now, when inflation is expected to be low, than in the past.

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<sup>5</sup>A fourth more practical rationale could simply be that the state can administer retirement insurance more cheaply than the private sector, and we discuss this further below.

Diamond (1977) also points out, however, that the third market failure — the inability to insure against changes in the length of working life — is both large and not necessarily very easily handled by institutions other than the public sector. Unexpected early retirements, possibly as a result of ill health, disability or redundancy, have big repercussions, since the period of time over which contributions are made is reduced and the period over which benefits are required is lengthened. Trying to insure privately generates the usual moral hazard and adverse selection problems (see Akerlof (1970), Arrow (1963) or Rothschild and Stiglitz (1976)), given the difficulties and costs in monitoring both health status and attempts or ability to obtain suitable employment. A social security system offers one way of providing insurance against declines in earnings associated with unexpectedly early retirements, although the precise details of system design will be important in determining the degree to which the system is effective in this dimension (see Diamond and Mirrlees (1986)). Mandatory retirement insurance can solve the adverse selection problem, but on the other hand, social security could worsen the moral hazard problem associated with early retirements, depending on the way in which benefits are affected.

(b) Paternalism

At the heart of the paternalism argument is the debate over whether individuals would provide enough for their own retirement in the absence of a social security system, i.e. does the government need to intervene to encourage or force individuals to undertake retirement saving? The main private mechanism for provision of resources in retirement is saving during working life, although transfers from other family members could provide additional resources. The question of how much of this would be done in the absence of a pension system is extremely difficult to answer on either a theoretical or an empirical basis.

From a theory point of view, how individuals allocate resources over their life cycle could be thought to depend on their expectations of their future economic circumstances, the way that they discount the future when taking decisions and their degree of risk aversion. The conventional neo-classical economic model for setting out these household or individual consumption and saving choices is the well-known life-cycle model, developed in the work of Duesenberry (1949) and Friedman (1957) and formalised as an empirical model of choice under uncertainty in Hall (1978). In essence, the model predicts that individuals wish to smooth the discounted expected marginal benefit of consumption across different periods of their lifetime. Saving and borrowing choices are the mechanism by which they can achieve this, given expectations about the amount of resources available to distribute.

Development and estimation of the life-cycle model spawned an enormous literature, with a number of developments being added or debated to make the model more flexible. For a full survey of the model and its implications for

spending and saving behaviour, see Deaton (1992) or Browning and Lusardi (1996). In particular, developments have focused on the role of uncertainty and the precautionary motive for saving, as well as on the importance of demographic variables such as household size and the number and ages of children, in determining the life-cycle allocation of spending. The empirical literature in this area is both large and inconclusive. There is still controversy about the extent to which the model can explain the consumption and saving choices we see in data, and hence predictions relating to the 'adequacy' of saving (either observed in data or at the level that would be required given the prevailing economic conditions) made from estimated parameters of the model are always controversial.

Possibly as a result, recent studies in saving behaviour have instead focused in detail on the way in which individuals make the relatively complex planning decisions required by the life-cycle model and on the factors that will affect the formation of those plans. Two areas receiving particular attention that are relevant for determining the rationality of such choices are (a) the possible use of rule-of-thumb approximations for complex intertemporal planning decisions and (b) self-control and the way individuals discount the future.

Bernheim (1991 and 1993) argues that the optimal saving plans derived from intertemporal consumption models are too complex for many people to compute. Even in the simplest models, they require someone to make an assessment of their expected income over their entire lifetime and to form expectations of future rates of return. In addition, individuals will have to take into account expected future labour supply and household composition, as well as the level of current and future benefits provided by the government. The counter-argument to this is that one might expect individuals to develop rules of thumb that provide approximations to the optimal plan, and there are some (limited) circumstances in which such approximations have been shown to be very accurate (see Deaton (1992)). However, when circumstances are changing, rules of thumb can become unreliable and out of date. The delivery of state retirement income and other benefits, the age structure of the population, household composition and formation, life expectancies and work patterns have all changed so much that such rules, if inherited from previous generations, would provide a very poor guide for younger generations.

In practice, there may be some middle ground, with approximate rules for behaviour being developed as a result of a number of influences, including family and peers but also including some reflection and 'planning'. It is likely that such plans would not be fully rational in the sense of the models described above, but they may perform reasonably well, given a realistic specification of the economic environment. This is an important but difficult topic for future research, and one that models of bounded rationality are beginning to address. What seems fairly clear, however, is that an understanding of the way in which individuals or households form their consumption and saving plans, and the

information that is used as inputs in those plans, are increasingly important inputs into pension policy design and analysis. This is confirmed by a series of interesting experiments in the US in which Bernheim and co-authors have shown that employees attending a series of financial education seminars choose to save more in various forms — in particular, in their tax-favoured employer pension (401k plan) — than those without access to the information.<sup>6</sup>

A second area of recent research on intertemporal rationality is the issue of self-control in intertemporal decisions. Thaler (1990) and Laibson (1994), for example, have argued that individuals have self-control problems that invalidate the standard life-cycle models since individuals are unable to postpone consumption from today to tomorrow. As such, it may be ‘optimal’ for them to engage in mechanisms that commit them to saving, and a required participation in some form of social security could be thought of as one of these mechanisms. Indeed, it is clear that such mechanisms, even outside pensions, although typically only partial commitment devices, do exist and are relatively widely used.

Related to these planning issues are those of how individuals discount the future when making their consumption and saving choices. Laibson (1997) and Laibson, Repetto and Tobacman (1998), for example, explore the implications of individual choices where the future is discounted differently according to how far away it is. For example, today I may prefer £60 in 15 years’ time to £50 in 14 years’ time, but 14 years from now I may have reversed my preferences over these two, i.e. I may actually prefer £50 immediately to £60 in one year’s time. The implication of this is that, although today I might think it optimal for me to start saving tomorrow, when tomorrow comes I will actually place a greater value on consumption rather than saving, so saving keeps being deferred.<sup>7</sup> Again, a possible solution is for people to be encouraged to engage in commitment mechanisms.

With regard to empirical research into the degree to which households save enough, a number of papers have looked at the issues involved. Diamond (1977) and Kotlikoff, Spivak and Summers (1982) argued empirically that consumers had insufficient savings to cover their retirement. Since then, this issue has become a controversial one, with no consensus emerging. To add to this, the measurement of individual saving itself is made more complicated when (average) capital gains are particularly high, as is the case with the current returns on the US stock markets (see Gale and Sabelhaus (1999), for example). Hence it is quite possible that simulation of economic behaviour under different models provides greater insights. Using such techniques, Hubbard, Skinner and

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<sup>6</sup>See Bayer, Bernheim and Scholz (1996), Bernheim and Garrett (1996) or Bernheim, Garrett and Maki (1997).

<sup>7</sup>Of course, the reverse could be true, as pointed out by Akerlof (1998), although this is not a case often dealt with in the literature. In this case, individuals may be thought to continually put off the point where they consume their wealth, and the argument would be for them to engage in spending, as opposed to saving, commitments.

Zeldes (1995) have shown that the structure of social insurance (and particularly asset tests) can have a strong effect on precautionary saving motives, and hence low saving may be the rational response to the current economic environment.

In the UK, Banks, Blundell and Tanner (1998) address the question of whether households save enough for their retirement by looking at what happens to consumption around retirement. Microeconomic data suggest that consumption growth, and indeed consumption, fall markedly around the time of retirement in a way that is not consistent with smoothing around this time. Banks, Blundell and Tanner (1998) show that two-thirds of this fall in consumption growth can be explained within the life-cycle model in terms of anticipated changes in household demographics and labour market status, but that an important proportion remains unexplained. This evidence suggests either that households have not saved enough or that there are unanticipated shocks occurring around the time of retirement.

One explanation may be found in the increasing body of evidence that individuals overestimate their future pension entitlements. Dilnot, Disney, Johnson and Whitehouse (1994), for example, provide evidence from the UK Retirement Survey that, for 40 per cent of individuals, retirement income was less than they had expected, and Ghilarducci (1992) gives similar evidence from the US. But there may also be other informational shocks occurring at the time of retirement. Expectations of the implications of illness or bad health might change following retirement as an individual's peer group changes.

The results of many studies (including, for example, the Banks, Blundell and Tanner (1998) paper) apply to a cohort of households that have already retired. But, as argued in Attanasio and Banks (1998), the economic environment has changed sufficiently in recent years that the behaviour of older generations is probably a very poor guide to the behaviour, or indeed needs, of younger generations. The empirical issue of current generations' adequacy of saving for retirement is therefore far from resolved. Even if this were not the case, inferring conclusions from the above studies about the counterfactual case, in which there were no social security at all, is another matter entirely. Since there is no developed country without some form of social security system or safety net, consumption and saving data do not exist with which to evaluate such an extreme counterfactual. In general, simulation approaches such as that taken by Hubbard, Skinner and Zeldes (1995) may, in the future, provide a way of learning about the implications of 'rational' behaviour in the presence of different institutional structures. This in turn could shed light on the degree to which observed behaviour is compatible with rational models of intertemporal choice.

To sum up this debate, there is little broad agreement in the literature relating to the adequacy of household saving or even over what the empirical concept of 'adequacy' really means. Even to the limited extent that there may be some consensus that households in the US are not saving 'enough', there is little

consensus on why this may be the case — whether as a result of incorrect expectations or of behaviour that is ‘irrational’ in a strictly neo-classical economic sense. If one considers Germany or Italy (where pensions are generous and saving is also high), one’s conclusions could be altered dramatically.

Further arguments that fit (indirectly) into the paternalistic motivations for public involvement in pension provision relate to the costs of individual decisions. That is, even if decision-making is rational, it could be that the costs of obtaining quality information on which to base choices outweigh the discounted benefits, and hence private outcomes are suboptimal when compared with the perfect information case. Alternatively, the costs of regulating private long-term saving scheme providers and ensuring that accurate information is available may be substantial. Thus, if these decision costs exist in life-cycle choices and are substantial enough, it may be the case that the centralising of these decisions may result in overall gains (as long as the government’s decisions are ultimately at least as effective). The relative importance of these arguments, however, remains a matter for debate.

Ultimately, then, the relevance of paternalistic-type arguments for social security remains a matter for debate amongst economists and policymakers alike. It would be possible to argue, for example, that (a) we do not currently know how important such arguments are, (b) we will never know how important such arguments are or (c) there may be no single answer anyway, given that the practical importance of the paternalistic motivation for pension provision depends on the degree to which we care about any resulting oversaving for those individuals who would have saved anyway. In general, if one believes consumption, saving and retirement choices are made rationally, then one is forced to rely predominantly on market failure or redistribution as a rationale for government intervention. If, on the other hand, one believes that individuals are myopic or time inconsistent, or that decisions are complex and information is costly to acquire, the paternalistic motivation for intervention can become a strong one.

Having said this, it is important to be clear that there is a difference between wanting to encourage saving and wanting to encourage saving in the form of pensions. Many of the above arguments apply to saving in general, and the paternalistic rationale for intervention could equally be construed as suggesting the need for broader investment in education and information provision, or the encouragement to hold precautionary balances, as well, or even instead.<sup>8</sup> This is particularly relevant when large groups of the population are holding little or no liquid wealth, as is the case in the UK (see Banks and Tanner (1999a)) and the US (see Bertaud and Starr-McCluer (1999)). The analysis of wealth inequality, and related topics such as financial exclusion, is becoming increasingly

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<sup>8</sup>Although, to the extent that longer horizons lead to greater ‘problems’ with individual choices, the argument for paternalistic intervention in retirement saving may be more important.

important for government policy and ought to be integrated with the analysis of pensions and retirement saving.

(c) Redistribution

One of the most important roles social security or pensions systems can play is in redistributing resources from one group of individuals or households to another, either across or within generations. Whilst this is discussed in more detail in subsection 3, with respect to the effects of different designs and possible reforms, it is worth noting that redistribution on its own is often put forward as a reason for the existence of social security policy. Indeed, if one believes that individual or household intertemporal choices are taken rationally, it is probably the strongest reason for public intervention in pension provision. Diamond (1977) points out, however, that redistribution motives, whilst legitimate, do not stand alone in justifying the social security systems that exist in most countries today, which can be very varied and generate very different types of redistribution, i.e. not just from rich to poor (see Creedy, Disney and Whitehouse (1993)). The UK and Australian systems, for example, are almost all redistribution, whereas the continental European systems contain very little, as will be seen below. And redistribution, after all, can be undertaken in other forms of government activity; there is not necessarily a reason, from a life-cycle perspective, to tax all workers (rich and poor) in order to give benefits to the retired (both rich and poor) as would be the case in a simple pay-as-you-go system (see below).<sup>9</sup>

*2. Design of Pension Systems*

Traditional views of pension systems are, in essence, very simple, being composed of only two elements. In the first instance, contributions are made out of earned income, and in the second, a stream of benefits are received at some point in the future. Within these two elements, however, there are many possible structures for schemes, all of which have been debated at length in the literature about the design, and subsequently the reform, of social security policy. Although we discuss them separately in what follows, each issue can be thought of as affecting one of four basic properties of pension schemes: the way in which contributions accrue entitlements to future benefits, restrictions on the conditions under which one can begin to receive benefits, the form in which benefits have to be taken or the particular agencies that may administer the schemes.<sup>10</sup>

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<sup>9</sup>Indeed, pension schemes may introduce redistribution that is undesirable and unintentional due to the complexity of the interactions between incomes, retirement, wealth and life expectancy.

<sup>10</sup>This is certainly the way that the literature has progressed since the study of Diamond (1977). Increasingly in the UK, and elsewhere (for example, Australia), with the movement to income provision for the elderly being provided by regular means-tested benefits, this model becomes harder to apply. Essentially, the concept of a

(a) Funding

Probably the most important, and certainly the most lengthy, discussions in the current policy debate relate to the degree of funding of a social security system.<sup>11</sup> In an entirely funded system, the contributions of an individual or generation (cohort) go towards a fund that is invested, accumulates and will ultimately finance the benefits received by that individual or generation when they retire.<sup>12</sup> In contrast, an unfunded system, commonly called pay-as-you-go (PAYG), is characterised by the contributions of current working generations paying directly for the benefits of those currently in retirement; that is, the system as a whole is financed on a year-by-year basis. A combination of approaches — partial funding — is also a possibility. The US system, for example, is a predominantly PAYG system where the excess of contributions received over benefits paid is accumulated into a fund that will help finance the system in future years. But this fund is small: although it has been growing since 1983, the fund currently represents only around 5 per cent of the liabilities of the system, and 90 per cent of payroll tax receipts are still paid out immediately (Feldstein, 1998).

There are two focuses of the debate about the degree to which a public pension system should be funded. First, the applied public finance literature points out that the amount of funding will affect the future fiscal position of the government finances (see Auerbach and Kotlikoff (1987), for example). With ageing populations and current structures of PAYG (or at least only partially funded) social security, the implied fiscal liabilities for government budgets can be enormous. Such changes, *ceteris paribus*, coupled with the government's intertemporal budget constraint, mean that, if left unchecked, social security systems will be leading future governments inevitably towards increases in taxes or reductions in benefits. For international evidence on the potential magnitude of these issues, see Section III or the more detailed analyses contained in studies carried out by the major international economic organisations, i.e. World Bank (1994), IMF (Chand and Jaeger, 1996) and OECD (1996).

The second aspect of the funding debate is a substantial, and related, discussion about the macroeconomic implications of funding, i.e. the possibility that a movement towards more funding can raise the growth of the capital stock and hence that there are long-run welfare gains to be made.<sup>13</sup> Aaron (1966) and Samuelson (1958) showed that the potential long-run returns on contributions within a PAYG system are given by the surplus of wage growth over population

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'state pension' is becoming more blurred. We stick to this approach, however, as it provides the most convenient way to discuss the majority of the literature.

<sup>11</sup>In this section, we abstract from issues of how much pension should be provided, i.e. what the appropriate levels of contributions and benefits should be. Such issues are important but tend to apply regardless of the particular design of the social security system.

<sup>12</sup>Plus, to some extent, the benefits of others if there is any risk pooling.

<sup>13</sup>At heart, this is not a discussion specific to pensions but an argument about welfare provision in general.



growth (i.e. the increase in the tax base) plus the rate of growth of the tax rate. That is, although the scheme pays out its benefits with the contributions of current workers, any individual will receive more from the scheme, relative to the contributions they made while working, as a result of economic growth. In contrast, the return the same individual would receive in a funded scheme would be given by the average net rate of return on their fund. Thus one argument for funding is that one might expect portfolio returns to be greater than wage or GDP growth and hence funded schemes offer a greater return. Miles (1998), amongst others, shows that this has certainly been the case *ex post* for a number of countries in recent years, but goes on to point out that the *ex-ante* risk properties of the portfolio investment would have been very different, and also that the difference in returns obviously depends on the particular portfolio selected in the funded scheme.

Although funding may well provide welfare gains in the long run, it is clear that there may well be substantial transition costs involved in getting the new system to maturity. These costs could outweigh the benefits of transition (depending on the discount rates and the degree of intergenerational altruism) in any realistic horizon because the transition itself will create a number of losers (see Flemming (1977) and Diamond (1998), for example). Auerbach, Gokhale and Kotlikoff (1994) use the Auerbach and Kotlikoff (1987) overlapping generations general equilibrium model to look at the transition paths in a suggested US reform. They argue convincingly that such a tool should be used by policymakers so that, at the least, gainers and losers can be identified when reforms are being considered. Auerbach et al. also show how different ways of financing transitions can have differing effects on economic welfare, finding an expenditure-tax-financed transition to minimise the welfare losses across their set of simulated reforms. Miles (1998) uses a similar framework to model different transition paths for European economies and shows that transition costs are potentially important in a European context — not surprisingly, since the nature of the funding problem is an order of magnitude greater in many European countries than in the US, let alone the UK (see below).

Of course, the establishment of an unfunded public pension system benefits an initial generation of retired people. By considering transition to a funded system from the point where the unfunded system has already been established, these gains are effectively ignored. This makes clear, however, that what is occurring is an intergenerational transfer, and the transition costs are essentially the inevitable ‘flip side’ of the initial welfare gains made at the introduction of the system.

#### (b) Public or Private Provision?

Related to the above arguments, but not equivalent, is the debate about whether there are advantages to social security systems being publicly or privately

provided. There is a tendency for some of the literature to associate ‘privatisation’ with funding, but, at least in principle, it is possible to have both public funded and private unfunded schemes. The arguments for privatisation should therefore not be confused with those outlined above for or against funding.

Instead, the arguments for privatisation rest predominantly on two issues: first, the ability of a private funded system to deliver investment returns more effectively than a public sector funded scheme; and second, the susceptibility of each system to political risk. We deal with the latter in subsection 3. The former (i.e. the efficiency of a privately run system compared with a public system) depends on three factors: administrative costs, the cost of regulation and the relative (risk-adjusted) performance of investment funds across private and public sectors. Whilst one would expect the administrative costs of a public scheme to be lower than those of a private system through economies of scale, the magnitudes of all three factors are uncertain. The charge ratios in the UK private pension system, for example, could be falling as the system becomes more established. But the cost of regulation, particularly in a complex system such as the UK, could be substantial. To the extent that these costs manifest themselves as fixed costs, they will introduce unwanted redistribution into the system, in the sense that they will affect the net rates of return of poorer households by more than those of richer households.

Even if such factors worked in favour of a public system, their effect may be offset by potential differences in expected investment returns between publicly and privately managed funds. These differences could be a result of the government failing to achieve portfolio returns on the risk–return frontier. Alternatively, however, the returns could differ as a result of the public scheme choosing a different point on the frontier. The importance of this obviously depends on the correspondence of preferences for risk between government and individuals.<sup>14</sup> Empirical evidence in this area is scarce and would greatly inform the private versus public debate. Comparative evidence by the World Bank (1994) suggests that the rate of return on publicly administered funded schemes has historically been low.

As a final thought in this area, there may be political economy issues relating to whether such direct government intervention in corporate activity is desirable. A public funded scheme would, after all, be a major shareholder in the private sector. In particular, this could be a big issue in countries with less developed capital markets, where firms may have problems raising domestic investment

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<sup>14</sup>Of course, if one believes that individual preferences are irrational with respect to risk (for example, exhibiting loss aversion or being affected by ‘framing’ — the way in which the risk is described to the consumer (see Kahneman and Tversky (1979 and 1986))), there may be a paternalistic reason for the government to intervene *specifically* to choose a different point on the risk–return frontier.

finance elsewhere. To the extent that publicly funded schemes are a genuine reform possibility, this is obviously an issue for further research.

In practice, the arguments for funding and the arguments for privatisation are often taken together — that is, many authors implicitly rule out the public funded option, possibly as a result of the potentially high political risks involved in governments managing funds on behalf of individuals (see the discussion of political risk, and particularly hypothecation, below).

### (c) Defined Benefit versus Defined Contribution

There are two ways in which contributions in a funded scheme can earn rights to benefits in the future. In the first type of scheme, referred to as defined benefit (DB), the benefit formula links future benefits to the history of earnings covered by the plan. In the second type — defined contribution (DC) schemes — contributions are channelled into individual accounts which accrue capital gains and interest based on portfolio returns, and the final value of the account is converted to a stream of benefits of some form on retirement.

The economic differences between the two ways of funding a pension system could be thought to be minimal since, in most respects, a DB scheme can be set up to mimic the outcomes of a DC scheme (although a DC scheme contains a degree of benefit commitment that is hard to generate in a DB scheme). The most commonly discussed difference between structures is that, by default, a DB scheme will spread risks over generations in a way that a DC scheme will not unless it is specifically set up to do so.<sup>15</sup> We deal with this issue in subsection 3. Apart from this, Diamond (1999) argues that the differences are essentially in the perception of the plan in the consumer's eyes. More particularly, a DC scheme makes the financing of benefits explicit but at the cost of the outcomes or benefits being fairly unclear. The reverse is true for DB schemes — the individual benefits are visible whereas the financing of benefits is typically opaque. Once again, we return to this issue later, since it is potentially important when considering the ease with which governments can alter contributions or benefits.

A further dimension in which the two methods of delivery differ is in the way in which they respond to the need for change as a result of demographic trends. In the case of an increase in life expectancies, for example, a DB scheme would require actuarial adjustments to the rates and rules of the plan whereas a DC scheme would typically adjust automatically.

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<sup>15</sup>To some extent, this is not a valid comparison. More valid may be a comparison of 'best' design as opposed to 'default' design, in which case the equivalence of the two types of provision is much closer.

(d) The Form of Benefits

One factor that has not received quite so much attention in the literature is the design of the benefits side of pension policy and, in particular, restrictions on the way in which resources can be withdrawn in a DC scheme. The exception here is the case of state benefits in a PAYG scheme, where the issue of the structure and indexation of the state retirement pension has received much attention from policymakers in the UK and elsewhere. Benefits from a funded scheme could, in principle, be given in the form of a lump sum, an income draw-down facility with the remaining fund continuing to accrue returns, an annuity or (as in the UK) some combination of all three. If the benefits are to be taken in the form of an annuity, there are a number of ways in which this could be provided.

Once again, the issue arises as to whether individuals would take rational choices themselves in the absence of rules over the form in which benefits can be taken. A further question is how annuity decisions will affect the surviving member of a couple on the death of the other member (Diamond, 1998). We discuss issues relating to annuity income receipt in the UK system in Section III, but the fact that, in current private annuity markets, most individuals choose nominal, as opposed to real, policies is taken by Diamond as evidence that annuity choices may not be rational. Likewise, he argues that the fact that, left on their own, people purchase single, as opposed to joint-life, annuities is further evidence to this effect. Whilst such outcomes (i.e. indexed joint-life benefit streams) could be, and are, achieved by appropriate design of a DB scheme, when pension provision is through a DC system the issues have to be either resolved by regulation or else left to individuals themselves.

Other arguments relate to the pros and cons of annuitisation. Put briefly, mandatory annuitisation is presumably better for those pure life-cycle savers who would have annuitised anyway (since, presumably, market rates will be better as a result of the removal of adverse selection issues). It is also presumably better for those who would not have annuitised but for whom annuitisation would be the best option — the by now familiar paternalistic argument. From a macroeconomic perspective, Kotlikoff and Spivak (1981) show that annuitisation lowers bequests. This could be thought to lower the level of capital stock in the economy if one believed bequests were optimal originally.<sup>16</sup> Annuitisation may also have effects on incentives and exposure to risk, which we will deal with below.

Finally, the absence of mandatory annuitisation can lead to moral hazard problems in the presence of other means-tested benefits. The experience of Australia has been a cautionary tale here. The existence of a compulsory private scheme without an annuitisation requirement, coupled with means-tested benefits starting five years after the age at which one can qualify for accrued

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<sup>16</sup>Of course, if one believed that bequests were excessive for some reason, such a dead-weight loss could be seen as a dead-weight gain.

private pension entitlements, has led to many households or individuals consuming their private pension wealth rapidly (particularly in the form of housing, which is exempt from the means test) and then subsequently qualifying for means-tested support (see Bateman and Piggott (1997)).

(e) Other Design Issues

There are a host of other design options and reform issues discussed in the literature which, for reasons of brevity, we do not go into in detail here. One important such example is the debate over the extent to which changes in the retirement age (i.e. the age at which one is entitled to receive benefits, as opposed to the age at which one actually retires) can offer a way out of problems associated with PAYG schemes and ageing populations, a debate popular in continental Europe (see Chand and Jaeger (1996), for example, or Disney (2000) for a critique). We deal with this briefly below. A similar set of arguments relate to the possible effects of immigrant workers on future system liabilities, essentially increasing the ratio of workers to retired, partially offsetting the pure ageing of the population.

A further set of issues relate to whether households should be ‘compelled’ or simply ‘encouraged’ to participate in pension schemes. This is particularly pertinent when there are multiple tiers of pension coverage, as in the UK, often associated with a co-existence of both public and private schemes. We talk more below about the UK’s ‘carrot-and-stick’ approach to this problem, where benefits in the state system have been eroded and tax advantages have been given to private schemes. However, if provision is voluntary, the same issues about rational choice as led to paternalism arguments will arise again. It is worth noting that the empirical studies that show households are not saving enough for their retirement show this within the context of current systems, i.e. including pension wealth, not in the absence of it.

The experimental evidence from Bernheim’s and his co-authors’ experiments provides some of the few pieces of *ex-post* evaluation relevant to the pensions debate.<sup>17</sup> The studies discuss changes in saving behaviour and attitudes, particularly relating to private pensions, within a sample population, some of whom were randomly chosen to receive various forms of financial education. While the studies show that consumer education can have an effect, they also imply that extensive, and presumably costly, programmes of consumer education and information provision may be required to raise consumers’ saving in a voluntary system, if a raising of saving rates is necessary. The work also suggests that the employer may be a natural channel for such programmes, although the arguments are less strong when one considers all but the biggest

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<sup>17</sup>Bayer, Bernheim and Scholz (1996), Bernheim and Garrett (1996) and Bernheim, Garrett and Maki (1997).

firms, since the cost per employee of such education programmes would presumably rise markedly for smaller firms.

Hence there may be problems with a voluntary approach to privatisation, particularly in redistributive terms if the decision to opt out is correlated with education, income or wealth. This is not to say that compulsion is necessarily the way forward, however, since such an approach generates its own issues, notably in determining a universal level at which to compel contributions, particularly in the presence of substantial heterogeneity (either observed or unobserved). Such an approach may also run the risk of increasing dead-weight losses in the system, since there is a danger of associated changes in incentives of the type described below.

These design issues, or for that matter those mentioned in earlier sections, will not reduce the increasing burden of pensions caused by ageing populations. Instead, what will change across different systems, or when systems are reformed, are which generations will pay the costs of population ageing and the way in which the costs will be borne. The discussion of social security reform, and particularly transition, in recent literature makes this clear. What is also clear, though, is that there are still valid and ongoing arguments regarding the relative merits of various policy options, especially funding versus PAYG and defined benefit versus defined contribution, although we would also argue that, to some extent, such distinctions are only a convenient shorthand. The real issues relate to the economic effects of various systems, and the literature has shown how similar effects and consequences can be achieved as a result of a variety of system designs. Finally, the transition costs debate makes it clear that what is 'optimal' depends on one's starting-point, and in particular the relative well-being of cohorts and the pattern of transfers between cohorts already in place.

Diamond (1996, 1997 and 1998), amongst others, has emphasised that the issues are as much political as economic, since choices are essentially over who should gain and who should lose. It is certainly true that the political dimension of pensions policy should not be understated. Voters choose governments, and pension systems are ultimately chosen as part of the electoral process, so the degree to which various reform options benefit different groups of society, and the way in which these groups are changing in size and political voice, may prove a strong factor in driving reform, although it is not clear which way the effects would go. Having said this, however, the economic design of pension systems does have a role to play in affecting behaviour and incentives and hence the dead-weight loss inherent in a system. Next, we deal with these issues briefly, before moving on to talk about some of the more common reform templates that have been suggested as ways of combating the problems caused by population ageing.

### *3. Impacts of Pension System Design*

The particular way in which pension and, more generally, social security systems are designed is likely to have big effects on economic behaviour and individual and social welfare. At the heart of design choices is the need to balance the gains from the redistribution and insurance offered by social security against any efficiency reductions or dead-weight losses that they may entail.

#### *(a) Risk*

Pension schemes, whilst presumably designed to offer as predictable an economic horizon as possible, provide differing degrees of insurance against different kinds of risks — in particular, demographic risks, economic risks such as those associated with future earnings, capital markets and annuitisation, and political risk. Thompson (1998) provides a comprehensive summary of these in turn, although the issues are partially confused by his focus on the differences in two specific dimensions, i.e. the comparison of an unfunded DB scheme and a funded DC design. Many, but not all, differences relate to the funded/unfunded, as opposed to the DB/DC, nature of provision.

Demographic risks arise from changes in the population structure, as a result of changes in birth or mortality rates. Under a PAYG model, the bearing of these risks is determined by the adjustments of tax rates and benefit rates, which in turn are determined by the outcome of the political process. Such potential risks can be large, as can be seen by the projections for European PAYG systems, given current population projections, presented in Section III. It is worth noting that a DC scheme is not necessarily immune from such demographic risks. Whilst the value of the fund on retirement is unaffected, the stream of real benefits that the fund will be able to purchase will be affected by prevailing asset prices, annuity rates and tax rates, all of which will presumably be affected by the demographic conditions that underpin the aggregate demand and supply of assets. The potential magnitudes of such effects is another area in which research is still at an early stage (see Schieber and Shoven (1997), for example).

Economic risks typically result from unanticipated changes in wages, earnings or investment returns during working life. Risky investment returns are not insured within a DC plan for obvious reasons, although a portfolio that moves towards safer assets as it gets closer to retirement date clearly reduces such risks. Whilst future wage and earnings risks are not insured within a DC scheme, since contributions to the scheme will presumably fall or lapse as a result, past earnings and wages are captured in the fund in an irreversible way.

Within most PAYG systems, on the other hand, contribution and benefit rates are not typically affected — if entitlements are linked to aggregate earnings growth, then, while real wage growth increases future liabilities, it also provides a bigger tax base with which to pay them. Investment returns are typically not important since the scheme has very few assets to invest. Funded DB schemes

are potentially more complicated, with the degree of insurance depending on the design. Well-designed benefits could, at least theoretically, offer fairly complete insurance. Poorly designed schemes could leave much of the risk borne by individuals. In particular, short averaging periods over which benefits are computed or high penalties for early withdrawal from the scheme (as a result of unemployment or job transitions) could mean that individuals' exposure to economic risk is substantial (see Brugiavini and Disney (1995) for a comparison of the DB and DC cases in the UK system).

Finally, understanding the degree to which different schemes can offer insurance against political risk is more complicated still. Thompson (1998) lists six types of political risk. The first three affect PAYG systems and are probably the most intuitive. The first relates to excessive promises — the idea that governments may be tempted to promise high returns (either as an electoral strategy or through a genuine misprojection of the population structure) which will not be delivered. Such risks are precisely those that the dynamic approach to fiscal policy suggested by Auerbach, Gokhale and Kotlikoff (1991) is designed to highlight. The second risk arises out of possible political stalemate meaning that adjustments to contributions or benefit rates cannot be made when required. Third, in the absence of political stalemate, the government may be tempted to adjust the net benefits of the scheme for reasons other than those to do with pension saving. At the heart of this final point is a hypothecation argument. There is a very real sense in which individual items of a government's budget are fungible, and the degree to which tax rises in a pension system can be identified or earmarked as paying for current benefits is limited.<sup>18</sup>

Thompson (1998) argues that a private DC design is not immune from political-type risk, although it may be thought that the risks are smaller. In the first instance, potential risks arise from transition costs (discussed earlier), although such risks are not present in equilibrium. Second, if there is a failure to ensure that financial assets are preserved sufficiently, individuals may be able to dissipate assets prior to retirement or draw down assets too quickly after retirement. Finally, ineffective administration or regulation may lead to returns being less than expected. But, while these three issues are certainly problems that need to be addressed with DC scheme design, they might not necessarily be thought of as political risks *per se*. More important, perhaps, is the fact that government policy needs to be considered as a whole, not just the pension system in isolation. It then becomes immediately clear that there are political risks in any intertemporal decisions, since the government could undo any private retirement saving by adjustments elsewhere in the tax and benefit system. To argue that there is less political risk in a funded DC (or DB) system is to argue that the benefits paid (or contributions received) by such systems are in

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<sup>18</sup>The US system has, however, been particularly successful at maintaining stability over contribution rates and building up a surplus in the trust fund independently of other budgetary pressures.



some sense more untouchable by government in a way that those in an unfunded scheme are not. The direct visibility of such changes, coupled with other practical problems in reforming private systems administered by third parties, presumably makes political risk smaller in a funded scheme. This is not to say that it is non-existent, as is made clear by the recent abolition of the dividend tax credit previously granted to pension funds in the UK.

(b) Redistribution

The second major issue when looking at the impacts of pension spending and pension systems is the effect, whether desired or otherwise, on redistribution. In one dimension, all pension schemes do is redistribute resources — over the lifetime of an individual from times in which they are high to times in which they are (expected to be) low. The more interesting dimensions, however, are across and within cohorts or generations of households. Many of the points relating to redistribution will relate closely to those on risk mentioned above, since the characteristics of schemes in each of these dimensions are linked. Once again, however, although such issues are important to bear in mind when thinking about possible policy reforms, it is also important to remember that further redistribution can be achieved, or redistribution can be undone, by other government policies. Hence it is ultimately always important to look at the redistribution properties of the tax and benefit system as a whole. This is not to say that it is not important to understand the way in which individual parts of government activity contribute to this whole.

Within PAYG systems, some redistribution from (contemporaneously) rich to poor is often a result of the particular benefits accrual formula. This redistribution could occur on the benefits side by offering guaranteed minimum pensions, offering supplementary flat benefits for everyone or using progressive benefit formulas, or on the contributions side if earnings only accrue benefits within particular ranges of earnings. In general, then, public unfunded schemes inherently redistribute in many dimensions: from the short-lived to the long-lived (i.e. from men to women, from poor to rich) as well as from the rich to the poor. Such redistributions and their interactions can be complex to understand. In the UK, for example, the rules for the State Earnings-Related Pension Scheme, and subsequent changes to these rules, have had large effects on the redistribution within the system that were certainly misunderstood and possibly unintended (see Dilnot, Disney, Johnson and Whitehouse (1994)).

An equally important issue, perhaps, is the intergenerational redistribution that is inherent in moving from an unfunded to a funded system. More precisely, such a move redistributes resources substantially away from the transition generations who have to ‘pay twice’. Ultimately, however, as pointed out above, society’s attitude to these transitional redistributions will depend on (a) the size of the transition costs and the generations on which they are incident, (b) the

degree of intergenerational altruism and (c) the degree to which future generations' utility, or welfare, is discounted by current generations.

Once in place, funded schemes also redistribute resources, but in different ways according to their design. A DB scheme redistributes across generations and, in most cases, from those with short tenure in the scheme to those with long tenure. On the other hand, unless mandated explicitly, a DC scheme with compulsory annuitisation redistributes from poor to rich and, in some circumstances, from men to women depending on the form of the annuitisation requirements. These latter results arise because mandatory annuitisation (with single-rate annuities) means that those living disproportionately long will gain most benefits (which have to be 'priced' at an average rate) by enjoying them for the longest time. Whilst it is clear from Figure 2 that women are expected to live longer than men, a number of studies have also shown that there is a correlation between wealth and life expectancy (see Attanasio and Hoynes (1995), Attanasio and Emmerson (1999) and Disney, Johnson and Stears (1998)).

#### (c) Incentives

The final issue relating to the design of social security systems is that of the incentives created by the schemes. In particular, the literature has focused on two areas — first, working-age labour supply and saving, and second, retirement. In the first case, labour supply and saving decisions will inevitably be distorted by pension schemes, since they alter the return to work and substitute for other forms of long-run saving. The size of the distortion, however, will depend on individual discount rates and on scheme design. If discount rates are high, contributions will be perceived essentially as a tax, since the future benefits will be discounted away, and there will be income and substitution effects on labour supply as in the standard framework. On the other hand, if future benefits are well understood, then one might expect some adjustment of saving behaviour. In an early empirical study, Feldstein (1974) used time-series data on pension wealth, consumption and saving to estimate that, on balance, social security reduced saving, a result that was hotly debated. Subsequent estimation has failed to establish a strong consensus over the magnitude of possible effects. In a more recent study, Attanasio and Brugiavini (1999), using a quasi-experimental framework on cross-sectional data from an Italian reform, find estimates of the offset that vary by age and lie between 30 and 80 per cent. This would suggest substantial substitutability between pension saving and other forms of saving.

The other dimension in which incentives generated by pension schemes may matter is in retirement decisions. The international comparative project of Gruber and Wise (1999) provides good evidence on these effects for state systems. Across countries, they show a striking correlation between the age at which benefits become available and departure from the labour force. They also show that the structure of a number of systems generates significant financial

disincentives to work beyond early retirement ages (the age at which one is *first* entitled to receive benefits) and that such disincentives are also correlated with retirement behaviour. With regard to private schemes, the importance of occupational pension ‘windows’ in the UK provides anecdotal evidence that the incentive effects may be equally powerful in determining retirement behaviour.

Even if social security does distort decisions and incentives — which it presumably does, the question being more ‘by how much?’ — such distortions may not be a bad thing. After all, redistribution and insurance can only be achieved if one is willing to pay in terms of efficiency. What the social security debate has pointed out, however, are the potential magnitudes of the trade-offs and the importance of particular designs in minimising distortions whilst providing the equivalent redistributive and insurance outcomes.

#### *4. Recipes for Reform*

We end this analysis of economic issues by providing a brief summary of how the above factors have been put together to generate structures for proposed reform. Invariably, there are a number of different approaches to the question of how we should reform unfunded social security systems, and indeed on the degree to which such reforms are needed and over what time-scale. Broadly speaking, though, Disney (2000), following Chand and Jaeger (1996), has categorised proposals for reform into four broad groups.

The first model is to restructure the benefit and/or contribution rates, possibly coupled with changes to the retirement age. Noting that the tax rate needed to finance the scheme is a function of wages ( $w$ ), benefit levels ( $b$ ), the number of contributing workers ( $L$ ) and the number of eligible pensioners ( $P$ ), one can write

$$t = \frac{b}{w} \frac{P}{L},$$

and hence changes in any of these four variables will affect the costs of the scheme to the taxpayer. Such proposals have been called ‘parametric’ since they keep the nature and structure of the system unchanged and alter only particular parameters within that structure. For an example of the simulated effects of this approach in a number of countries, see Chand and Jaeger (1996). The advantage of such an approach is that it is not too drastic, and indeed its proponents typically argue that the demographic projections are such that a funding crisis can be avoided with only small parametric adjustments as long as they are made sufficiently early (see, for example, Munnell (1998)). Whilst this argument was made for the US, it is not clear that it is so relevant where the demographic situation is more acute (for example, in Italy or Japan).

Parametric reforms may often be used in conjunction with other more structural changes, as is the case with the UK reforms described below. The first disadvantage of pure parametric reform, however, is that the precise adjustment needed will be extremely sensitive to assumptions on the future of the system, and by the time such assumptions can be assessed against likely outcomes, any compensating interventions needed will be much greater. In addition, the arguments for parametric reform are presumably more relevant where the demographic conditions are relatively less unfavourable (for example, in the US) as opposed to other countries (such as Italy or Germany) where they are severe. Finally, there may be a sense in which specific parameters of the system may be less effective than others. It is far from clear that movements in the retirement age,<sup>19</sup> for example, will be effective. On the contributions side, given that an increasingly large proportion of the work-force are retiring earlier than the statutory retirement age, any increase in the state retirement age will not necessarily generate increased contributions. Also, the degree to which less benefits will need to be paid will be determined by the degree to which early retirees are retiring on to other (possibly means-tested) benefits or are covered by other forms of income. Hence parametric reform can be a technically complicated option, and the desirability of one option over another may well depend on particular assumptions or projections.

The second broad approach to reform delineated by Disney (2000) is the ‘actuarially fair’ approach (which underpins recent reforms in Sweden, Poland and Latvia as well as Italy), although we would argue that this can be seen as, in some sense, a particular case of structural adjustment, the only difference being in the one-off nature typically proposed in the context of the latter. By ‘actuarially fair’ reform is meant an explicit linking of the benefits in the scheme to the contributions, while retaining the unfunded nature of the system. ‘Notional accounts’ are set up to mimic DC plans (i.e. with individualised retirement benefits that are conditional on contributions) but with the scheme remaining unfunded. The approach is to calculate implicitly the implied rate of return (given wage and population growth projections) and then set the accrual rate of pensions to achieve this. Post-retirement benefit indexations are linked explicitly to demographics. Disney (1999) points out a number of problems with this approach. Namely, there is still no guarantee that the ‘Aaron–Samuelson’ condition for equilibrium of the unfunded scheme on which the rate of return adjustments are based — that the rate of return on contributions is equal to the surplus of wage growth over population growth — will continue to hold in the future. Presumably, such calculations will be very sensitive to the projections used, and there may be a need for repeated adjustments over time. Second,

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<sup>19</sup>With parametric reform, one has to be very precise about which parameter one is discussing. In this case, it could be the age at which one is first entitled to receive benefits at a reduced rate, or the age at which one is entitled to receive full benefits, or the age at which one actually retires.

Disney (1999) argues that there may be some downward rigidity in adjustments for political reasons, pointing out that when the growth of wages falls below inflation, it is unlikely that pensions will be set to grow by less than the cost of living. Finally, and more structurally, he argues that such reforms, by making the benefit–contribution link transparent, take away the rationale for public (unfunded) schemes in the first place, and may become politically unsustainable, given that the implicit returns will be observed directly and then compared with possibly high market returns available on private retirement saving alternatives.

The third model for reform, favoured by some US authors (Feldstein (1998) and Kotlikoff (1996a and 1996b), for example), is a wholesale privatisation and a switch to DC plans, i.e. some form of ‘individual accounts’. Examples of reforms on these lines are the Chilean reform of 1980 (followed in a number of other Latin American countries) and, to some extent, the Australian reform of 1992. Whilst such a move to funding will probably increase returns and may have other benefits, as described above, the main issue in such a reform is the management of the transition costs, an issue that has generated substantial debate (see, for example, Auerbach and Kotlikoff (1991)). The other concern is over redistribution, since within-cohort redistribution will be all but eliminated in such a move (apart from that implicit in mandatory annuitisation). Thus other redistributive mechanisms may need to be introduced simultaneously and their costs would need to be added to the costs of the reform.

The final reform package, favoured by the World Bank, and increasingly being introduced, particularly in developing countries, is a partial privatisation and a movement towards a ‘mixed-pillar’ or ‘multi-tier’ system. Such an approach is close to the wholesale privatisation option, but with a retention of some part of the state system for some individuals, thus, presumably, ensuring some redistributive role for pensions and reducing the need for offsetting changes elsewhere. Such an approach, coupled with some parametric reforms to the unfunded part of the system, would be a good description of the route taken by the UK in the series of reforms since the late 1980s, which has been referred to as a voluntary or ‘back-door’ privatisation (Disney and Johnson, 1998). In this case, the advantages over and above the clean-break privatisation are that the transition costs can be spread more widely and that some redistribution can remain. However, the transition still has to be managed carefully, and, if individuals’ decisions to opt out are correlated with wealth, there can be standard adverse selection issues and the opportunity for within-cohort redistributions can be reduced. Finally, the degree to which individuals may understand the options on offer, and their relative pros and cons, may be an important factor to consider, as was clearly the case in the UK’s introduction of personal pensions and the subsequent mis-selling scandals.

Although each of the four reform strategies has its advocates (in all cases, very eminent experts), it seems to us that there is no genuine agreement on which route is preferable, and indeed on the extent to which the routes truly differ in

altering the underlying economic conditions. In a practical sense, the actuarially fair route is very similar in spirit to the parametric approach (particularly since parametric reforms will presumably happen repeatedly as opposed to only once). The final 'mixed' approach is precisely a combination of the parametric and structural approaches, with the degree of each being a crucial but unspecified factor.

The absence of an 'optimal' route for reform is what one would expect in so far as the route required will presumably depend upon each country's particular circumstances, with regard to its demographic situation, economic projections, and the aims and structure of the system that is already in place. It seems sensible to suggest that the preferred reform option should differ in differing situations and that reform should be approached on a country-by-country basis. In the international debate on reform, agreement now exists about the potential effects that need to be considered in designing reform. In this sense, we would argue that the structural options for reform are now well understood, and the main strategies adopted from now on will depend upon two sets of practical issues. The first relate to the political economy of pension reform, since these issues will determine the precise nature and direction of the reform process. The second set of issues relate to the economic evaluation of the magnitude of the potential transition costs incurred by a switch to a funded system, which in turn will depend on a wide variety of financial and labour market factors that are currently not known with very much certainty. Examples include the magnitude, nature and importance of income uncertainty, the magnitude, variance and persistence of shocks to asset returns, the size of the risk premium, the degree of mean reversion in stock prices and the degree of risk aversion of individuals.

In the European policy debate, there is still little articulation of, let alone agreement over, the practical benefits of each reform approach. Indeed, it is not clear to us that the complete set of options has been spelled out explicitly. Recent papers (Miles and Timmerman, 1999; Boldrin, Dolado, Jimeno and Peracchi, 1999) have used simulation analysis of possible transitions to a fully funded model to suggest that a movement towards funded schemes in a clean-break privatisation is not likely to be the solution to the problems Europe faces as a result of its ageing populations. This is essentially because the demographic problems are so severe that the transition costs are likely to be enormous. However, detailed debates of the implications of parametric reforms, partial privatisations or actuarially fair adjustments have only, to our knowledge, been looked at in a minority of country-specific analyses.

### **III. SOCIAL SECURITY SYSTEMS IN PRACTICE: THE UK EXPERIENCE**

This section describes how the UK pension system has evolved in practice, with reference to the theoretical framework outlined above. The pension system is

clearly an extremely important area of government spending — in 1998–99, the UK government spent over £100 billion (around 30 per cent of total public spending) on social security and welfare benefits, of which half went to elderly people. Moreover, this public spending interacts with individuals' decisions to make their own provision for retirement income. Flows into funded private pension schemes amounted to some £15 billion (Office for National Statistics, 1996).

A description of the UK pension system will generally suffer from an inevitable degree of simplification as a result of the various complexities of the system. Again, we would refer interested readers to other works on the subject. For a balanced view, we would suggest, in particular, Budd and Campbell (1998), Dilnot, Disney, Johnson and Whitehouse (1994), Disney and Johnson (1998), Disney (1996) or Blundell and Johnson (1999), who all provide descriptions of the UK system in comparative volumes.

It should also be remembered that one of the key features of the UK state pension system is that it is almost continuously undergoing 'radical' reforms, as is the case at the moment. Hence discussions of likely future reforms tend to become dated very quickly. Indeed, this is one reason why relating the UK system, in particular, to the principles of pension provision defined earlier is difficult. Such principles often refer to systems in maturity, so they are effectively redundant in practice, since the UK system has not yet been in equilibrium and does not look like being so for some time. This in turn is a reminder that pension reform occurs as a result of political changes which, at least in the UK, tend to occur frequently. As late as 1992, for example, the Labour Party was proposing an increase in generosity of state involvement in pensions and, conversely, in 1997, the Conservatives proposed funding the basic state pension. Neither of these reforms seems particularly likely to occur in the UK in the foreseeable future. Since the UK pension system is, however, a product of numerous reforms introduced by different governments over the last 50 years, it is perhaps not surprising that it contains a degree of incoherence and complexity. This in turn makes it difficult to understand the genuine impacts of the system with respect to the issues outlined above, i.e. redistribution, risk and incentives. Of course, the obvious implication of this is that perhaps the best reforms that could be made are ones aimed at simplifying the current system rather than adding additional complexity, unless strong arguments can be made to justify this complexity.

This section looks at the UK's approach to public and private pension provision and contrasts it with those of other countries. This highlights the vast diversity of pension schemes around the globe and also the corresponding levels of income that they deliver.

### *1. The Current Social Security Framework*

State pension provision in the UK is split into two tiers. The first consists of the *basic state pension*, which is a flat-rate contributory pension, financed on a pay-as-you-go basis. In addition, many elderly adults receive a significant amount of income-related benefits — namely, the minimum income guarantee, housing benefit and council tax benefit. The second tier consists of the *State Earnings-Related Pension Scheme*, more commonly known by its acronym SERPS, which is also financed on a pay-as-you-go basis. However, this earnings-related element to the state pension system was only introduced in the UK in 1978, which is much later than happened in many European countries, such as Germany and Italy. Since funded schemes were already in existence by this time, provisions have always been included to allow individuals to ‘opt out’ of SERPS into funded private pension schemes.

Private savings vehicles are an extremely important part of the UK pension system. The current generation of UK pensioners receive 40 per cent of their income from private sources, and government policy is to aim for this to increase to 60 per cent by 2050 (Department of Social Security, 1998a). This private retirement income comes mainly in the form of *occupational pensions*, which typically operate on a DB basis. In future, *personal pensions*, which operate on a DC basis, will form a significant proportion of retirement income as they have become increasingly popular since they were first available as an alternative to SERPS in 1988. Around one-half of those earning above the lower earnings limit (LEL)<sup>20</sup> are currently members of a DB scheme and one-quarter are members of a personal pension. The remainder are still accruing SERPS entitlements. In what follows, we discuss each part of the UK pension system in more detail.

#### (a) The First Tier of Coverage: Basic State Pension

The UK first introduced a state pension as early as 1906. This was a means-tested benefit payable to those aged over 70 with ‘good character’. The basic state pension, which still exists today, was introduced in 1948 as part of Beveridge’s social insurance scheme. It paid a flat rate of £1.30 a week, equivalent to about 14 per cent of average earnings, financed by flat-rate employee contributions (Beveridge, 1942). This was in contrast to the earnings replacement ‘Bismarckian’ systems that developed in Germany, France and Italy (see Johnson (1999)). These provide a genuine level of social insurance so that individuals with higher levels of earnings during their working lives, and hence higher levels of social security contributions, will receive a more generous pension from the state.

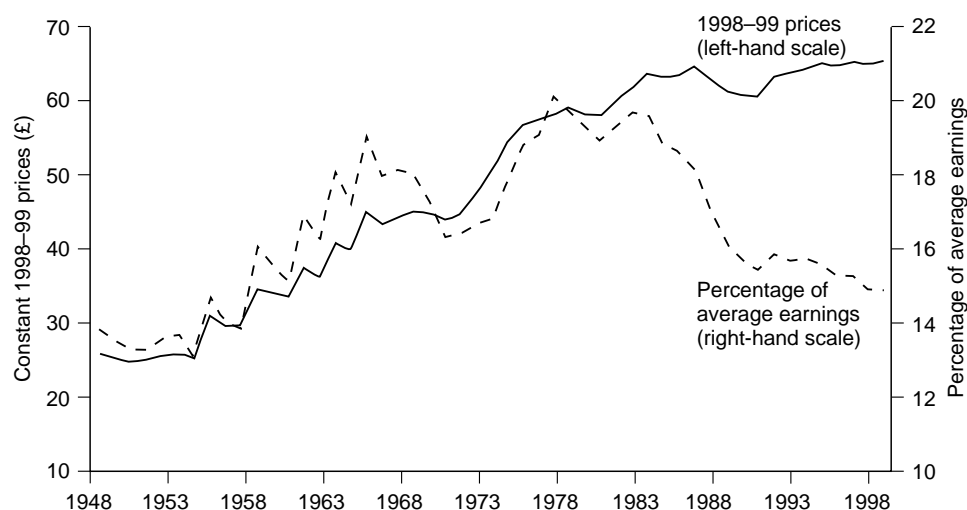
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<sup>20</sup>This is the point at which individuals start to accrue rights to contributory benefits, which in 1999–2000 is set at £66 per week.



FIGURE 4

**Value of the Basic State Pension in 1998–99 Prices  
and as a Percentage of Average Earnings**



Sources: HM Treasury, 1996; Office for National Statistics website.

In the UK, individuals with sufficient National Insurance contributions<sup>21</sup> receive the basic state pension when they reach the state retirement age, which was set in 1948 at 65 for men and 60 for women, its current ages.<sup>22</sup> Between 1948 and 1975, the basic state pension was indexed on an *ad hoc* basis, and increases over the period meant that its value was preserved relative to average earnings. The 1975 Social Security Act committed future governments to increasing the basic state pension by the greater of price or earnings growth, and its generosity reached around 20 per cent of average earnings in the early 1980s. Since 1981, indexation of the basic state pension has been to increases in the retail price index. As the UK has experienced real earnings growth over the last two decades, the basic state pension is now worth just 15 per cent of average earnings, as shown in Figure 4. Should price indexation continue each year, then by 2050 the basic state pension will only be worth 7 per cent of average earnings.<sup>23</sup>

<sup>21</sup>These comprise employee payments as a percentage of earnings between lower and upper earnings limits, and employer contributions on earnings above the LEL. The structure of these contributions has been repeatedly reformed (see Chennells, Dilnot and Roback (1999)).

<sup>22</sup>Legislation already in place will increase the retirement age for women by six months every year from 2010 until 2020, when equalisation at 65 will be achieved for everyone born after 1955.

<sup>23</sup>Assuming real earnings growth of 1½ per cent a year. Implications of price indexation of the basic state pension, the LEL and the upper earnings limit are discussed in Disney and Whitehouse (1991).

Individuals need to have made National Insurance contributions for 90 per cent of their working lives in order to qualify for a full basic state pension. However, since credits are available for periods of unemployment, illness or disability, around 86 per cent of men and 49 per cent of women qualify for the full amount (Department of Social Security, 1998a). These figures are expected to continue to rise in future, due to reforms such as the introduction of home responsibilities protection (HRP)<sup>24</sup> and the abolition of the right for married women to 'opt out' of the basic state pension, and also because of increased labour market participation by women.<sup>25</sup>

There is no possibility of early retirement benefits, but individuals are able to defer receipt of the basic state pension for up to five years, in return for which they receive an increase in their pension entitlement of 3.6 per cent. This is in contrast to the US and German systems, which provide allowances for individuals to claim state pension benefits before they reach the retirement age, albeit at a reduced rate. In the UK, the number of deferrals has fallen, with just 9 per cent of pensioners in the 70- to 74-year-old age-group receiving increments on their pensions, compared with 19 per cent of those aged over 80 (Department of Social Security, 1999b). This appears to be largely a result of the abolition of the earnings rule in 1989, which means that individuals can now continue to receive earnings after the retirement age without having their pension entitlement reduced (Whitehouse, 1990; Blundell and Johnson, 1999). As we mentioned earlier, this corresponds to evidence suggesting that the design of these systems does influence retirement behaviour (Gruber and Wise, 1999; Tanner, 1998).

#### (b) The First Tier of Coverage: Means-Tested Benefits

The current system design means that, in principle, no individual is actually left in retirement with just the basic state pension, since it is now worth less than the level of support given to pensioners through means-tested benefits. The main means-tested benefit for the elderly — the minimum income guarantee (the benefit formerly known as income support) — is currently worth £75 per week, some £8.25 more than the basic state pension. In practice, however, some are left with incomes below this level since only 68–79 per cent of eligible pensioners actually claimed income support.<sup>26</sup> This is likely to be as a result of both stigma and the fact that many individuals becoming eligible for means-tested benefits in retirement have never previously received state benefits. The government has stated that 'over the longer term ... [its] aim is that [the minimum income guarantee] should rise in line with earnings'. This is unlike the basic state pension, which is to remain indexed to prices. This policy of focusing additional

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<sup>24</sup>This gives credits for years in which individuals bring up children or care for other dependants.

<sup>25</sup>See Dilnot, Kay and Morris (1984) and Disney (1996) for a discussion of the contributory principle. Johnson and Stears (1996) discuss implications of current and future levels of entitlement to the basic state pension.

<sup>26</sup>Estimates from Department of Social Security (1998b), revised in DSS Press Release 98/300.

state spending on those in greatest need contrasts starkly with the German, French and Italian pension approach of providing genuine social insurance and hence higher pensions to individuals with higher lifetime earnings.

Pensioners are also eligible to claim two other income-related benefits — housing benefit, which, as its name suggests, provides help with housing costs, and council tax benefit, which relieves the burden of local taxation on low-income households. Currently, some 40 per cent of pensioners receive some form of income-related benefit (Department of Social Security, 1999b). By international standards, this high level of income-related support to pensioners is an outlier with the exception of Australia, which operates an almost entirely means-tested pension system. Such high levels of means testing in retirement have led to concerns among policymakers about the number of people facing a disincentive to work and save for retirement, and qualitative studies suggest that such concerns are certainly evident in the population at large (see Banks and Tanner (1999b)).

By making assumptions about the level of earnings growth and annuity rates in the future, it is possible to calculate how much an individual needs to have saved in order to purchase a stream of income equivalent to the level of means-tested benefits. For example, it is quite possible that an individual retiring in 2050 would need some £130,000 in 1999 prices to purchase an annuity equal to the minimum income guarantee (MIG).<sup>27</sup> Of course, this overstates the degree of disincentives provided by the MIG, since any employee earning above the LEL will be eligible for a state pension. However, the maximum possible state pension for someone retiring in 2050 is equivalent to a fund worth £110,000, even if the individual has a full 49-year contribution record, which is still £20,000 short of the value of the means-tested floor. This is due to the fact that, once in retirement, the level of state pension is indexed to prices while the MIG increases in line with earnings.

#### (c) The Second Tier of Coverage: SERPS and Occupational Schemes

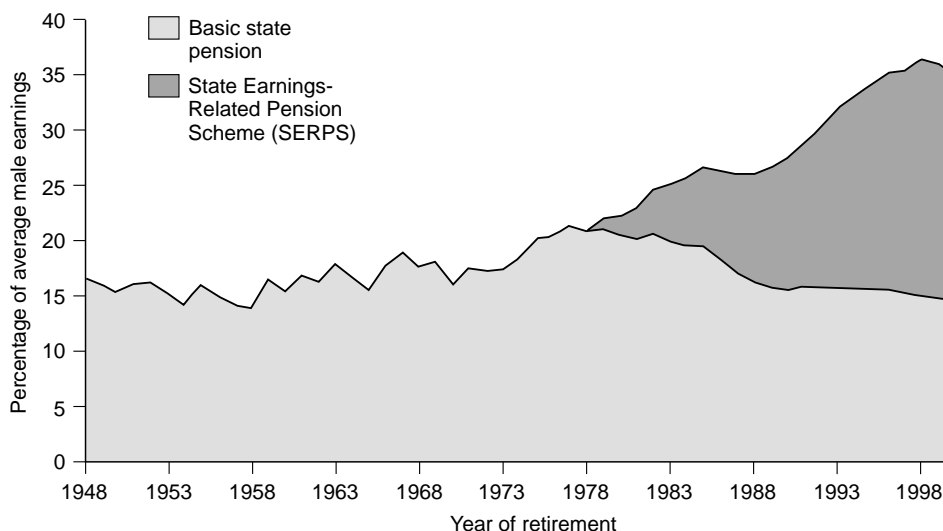
Since the basic state pension was flat-rate and at a level likely to be unacceptably low for many workers, it is not surprising that supplementary pension coverage grew substantially over the 1950s and 1960s, particularly given the growth in real incomes over the period. Membership of occupational pension schemes, which on the whole operate on a DB basis, increased from 28 per cent of employees in 1953 to 53 per cent in 1967 (Pension Law Review Committee, 1993).

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<sup>27</sup> Assuming real earnings growth of 1½ per cent a year, annuity rates of 4 per cent and no real growth in rents or council tax bills. Should rents and council tax bills also increase by 1½ per cent, then this figure rises to nearly £165,000.

FIGURE 5

**Total Basic State Pension and SERPS Entitlements for Individuals with Complete Contribution Histories, by Year of Retirement**



Notes: Assumes a full contribution record — 44 years for men and 39 years for women. Figures for basic state pension as a share of average earnings differ slightly from those in Figure 4 since a slightly different earnings index has been used. However, the broad pattern is the same regardless of the choice of index.  
Source: Government Actuary's Department, 1999.

The reforms introduced in the 1975 Social Security Act were, in part, a response to the fact that those individuals who were unable to join an occupational pension scheme were left reliant on the state for their pension. Hence the level of compulsory saving was increased: from 1978, all employees had to contribute to the State Earnings-Related Pension Scheme unless they were a member of a DB occupational pension scheme that was guaranteed to be at least as generous as SERPS,<sup>28</sup> in which case they were allowed to opt out of the state scheme. In opting out of SERPS, individuals and their employers paid a reduced rate of National Insurance contributions, and individuals relinquished SERPS entitlements but would continue to qualify for the basic state pension. Figure 5 shows the degree of first- and second-tier state pension coverage in the UK for an individual who earned the male average in each year of his or her working life.

An indication of how relatively ungenerous the UK pension system is compared with other OECD countries is given by Table 2, taken from Johnson

<sup>28</sup>This was known as the guaranteed minimum pension, which has since been abolished. For a more complete discussion of the 1975 reforms, see, for example, Disney and Johnson (1998).

TABLE 2  
**International Comparison of Replacement Rates  
 for Individuals with Different Levels of Male Earnings**

	Individuals earning:		
	<i>Half average male earnings</i>	<i>Average male earnings</i>	<i>Twice average male earnings</i>
Canada	50	51	51
France	48	95	165
Germany	34	72	150
Italy	32	82	192
Netherlands	41	41	41
New Zealand	38	38	38
UK	25	34	48
US	32	55	64

Note: Net replacement rates are taken as a percentage of the earnings of those approaching retirement, except for Germany and the US where they are taken as a percentage of overall average earnings.

Source: Johnson, 1999.

(1999). The table shows quite clearly that there is a large degree of variation in the generosity of state schemes across the countries listed, from 25 per cent to 50 per cent of average male earnings for someone on half average male earnings and from 38 per cent to 192 per cent of this level for someone earning twice average male earnings. Countries such as Germany, France and Italy offer earnings replacement schemes and, as a result, individuals with higher lifetime earnings receive higher state pensions. By contrast, the Netherlands and New Zealand offer the same flat-rate pension regardless of the level of earnings (and hence contributions made). The UK, Canada and the US have schemes where the pension does vary with earnings, albeit to lesser degrees. An important aspect to bear in mind when looking at these types of replacement rates is that they tend to understate the replacement rate for any single individual. This is because, with real earnings growth, the level of income amongst the working population will be higher than that experienced by the retired when they worked, and replacement rates such as those in Table 2 are computed cross-sectionally without taking such effects into account. This will, of course, not change the dispersion, or relativities, between countries, as long as wage growth across cohorts is broadly comparable.

#### (d) The Second Tier of Coverage: Personal Pensions

The right to 'opt out' of SERPS was expanded to DC pension schemes in the 1986 Social Security Act, taking effect from 1988. These funds, known as approved personal pensions (APPs) or simply personal pensions (PPs), received a portion of an individual's National Insurance contributions paid into the

account on the individual's behalf.<sup>29</sup> This payment was set at such a level that, under reasonable rates of return, individuals would receive a pension at least as generous as the SERPS entitlement that they were forgoing.

Since 1988, DC personal pension schemes have become extremely popular. This is perhaps not surprising, given the fact that personal pensions were and continue to be one of the most tax-privileged forms of saving. Contributions are made from income free of income tax, returns accumulated in the fund are also untaxed and a quarter of the fund can be taken tax-free on retirement.<sup>30</sup> In addition to this, initially the contracted-out rebate did not vary with age and the government also paid a bonus 2 per cent contribution into individuals' funds as an extra incentive to contract out in this way. This meant that the young in particular were likely to benefit from contracting out of SERPS and into a personal pension.<sup>31</sup> By 1995–96, there were some five-and-a-half million people contributing to personal pension schemes in the UK (Department of Social Security, 1999b), with membership being particularly high among 25- to 34-year-olds (Whitehouse, 1998).

While DC personal pension schemes have become more popular, take-up of DB occupational pension schemes among full-time men has fallen since the early 1980s. This is similar to the trend observed in the US, where the introduction of 401k plans (occupational DC plans) resulted in a lower take-up of occupational DB schemes. In addition to the introduction of personal pensions, other changes have contributed to the reduction in coverage of DB pension schemes, such as the increase in importance of small and medium-sized firms, the increase in the number of self-employed and the increase in labour market mobility. Membership of DB schemes among women has continued to grow; however, this is at least partly due to legislation that has made such schemes more accessible to part-time workers in particular (Barrientos, 1998; Disney and Stears, 1996).

#### (e) Annuities

As discussed in Section II, an important part of the design of a social security system is how payments are made in retirement. State pensions and DB private pensions in the UK are equivalent to annuitised wealth, although they may have different degrees of indexation. Those with DC private pensions are forced to annuitise the majority of their private pension savings. The element of the fund

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<sup>29</sup>This is known as the contracting-out rebate (COR). Budd and Campbell (1998) provide a discussion of the 1985 Green Paper and the subsequent 1986 Social Security Act which also introduced the possibility of individuals contracting out into occupational DC schemes.

<sup>30</sup>See Dilnot and Johnson (1993), Emmerson and Tanner (2000) or Banks and Tanner (1999a) for more details on the taxation of private pensions in the UK. Some international comparisons are contained in Whitehouse (1999).

<sup>31</sup>This was due to a combination of the impact of compound interest and the fact that cuts to SERPS had reduced its generosity to younger cohorts. See Disney and Whitehouse (1992) or Dilnot, Disney, Johnson and Whitehouse (1994) for more details of the incentives to 'opt out' of SERPS.

that comes from the contracted-out rebate has to be used to purchase a protected rights annuity, which pays the same for men and women, i.e. insurance firms are not allowed to offer better terms to men despite their lower life expectancy. This must be done between the ages of 60 and 75. The remainder of an individual's pension fund consists of voluntary pension saving (i.e. saving over and above the compulsory second tier), of which one-quarter can be taken as a tax-free lump sum while the rest has to be annuitised between the ages of 50 and 75.<sup>32</sup>

Individuals are, however, given a range of options for how to annuitise their savings — for example, whether they are fixed in nominal terms, indexed to prices or linked to some investment. Annuities can also be on either a single- or a joint-life basis.<sup>33</sup> Those choosing to defer annuitisation make income withdrawals from their fund, subject to certain minimum and maximum amounts.<sup>34</sup> If the individual dies before they have annuitised the fund, then it can be converted into cash, subject to a tax of 35 per cent.<sup>35</sup> This is likely to be very important for those with a bequest motive (Khorasanee, 1996), since, while individuals could purchase a joint-life annuity, the value of a fund with a draw-down facility is clearly greater, conditional on the comparison between draw-down rules and annuity rates.

Individuals can also choose to convert part of the lump sum, or for that matter any other savings, into an annuity if they wish. However, there is evidence that those purchasing an annuity voluntarily receive a lower rate than those making a compulsory purchase. This suggests the presence of adverse selection — namely, that it is those individuals who expect to live longer than average who are choosing to purchase voluntary annuities (Finkelstein and Poterba, 1999).

#### (f) Future Reforms

Despite the fact that the UK pension system has been under almost continuous reform for almost a quarter of a century, the current government has proposed more changes. Many of the proposals are a continuation of the direction of reform since 1981. The government is to continue focusing additional support on the poorest pensioners by increasing the level of means-tested benefits rather than increasing the generosity of the basic state pension.<sup>36</sup> SERPS is to be abolished and replaced by the *State Second Pension* (SSP), which will eventually become a flat-rate top-up to the basic state pension. This makes SSP more

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<sup>32</sup>Prior to the 1995 Finance Act, annuitisation had to be done at the time of retirement. Murthi, Orszag and Orszag (1999) examine protected rights and compulsory annuities in the UK.

<sup>33</sup>McDonald (1999) provides a description of compulsory annuity options.

<sup>34</sup>These are currently set at 35 per cent and 100 per cent of the annual amount that an annuity purchased with the fund would provide. Source: Tolley's (1999, Section 65.5 (ii)).

<sup>35</sup>Tolley's, 1999, Section 65.2 and Section 65.5 (viii).

<sup>36</sup>As pointed out earlier, such means-tested benefits do not necessarily fit into the framework for 'pensions' outlined above. However, whether such a switch is seen as a contraction of public spending on pensions or not is essentially a semantic debate.

generous to lower earners than its predecessor, SERPS, and will help to alleviate some disincentives by increasing the returns to work and saving among lower earners. However, since benefits in retirement will be indexed to prices, while the MIG will continue to be linked to earnings, many individuals will still find themselves on means-tested benefits at some point in their retirement (Agulnik, Barr, Falkingham and Rake, 1999; Disney, Emmerson and Tanner, 1999).

In addition, further growth of private sector coverage is also planned with the introduction of *stakeholder pensions*, which are essentially bench-marked personal pension schemes that may be more appropriate for lower earners.<sup>37</sup> One potentially important aspect of the reforms is the fact that employers will be compelled to designate a stakeholder scheme for their employees and make payroll deductions on their behalf. With regard to the paternalistic arguments outlined earlier, this employer involvement may help increase pension saving by enabling individuals to get in the habit of making regular contributions to a stakeholder pension direct from their pay-packets. In essence, however, the

TABLE 3  
**Use of 'Voluntary' Incentives and Greater Compulsion in Pension Reforms  
with Transitions to Greater Levels of Funding**

	<i>Year of reform</i>	<i>Switching for new entrants</i>	<i>Switching for current work-force</i>
Argentina	1994	Voluntary	Voluntary
Bolivia	1997	Mandatory	Mandatory
Chile	1981	Mandatory	Voluntary
Colombia	1994	Voluntary	Voluntary
Croatia	2000	Mandatory	Mandatory, aged <40 Voluntary, aged 40–50
El Salvador	1998	Mandatory	Mandatory, aged <35 Voluntary, aged 35–55
Hungary	1997	Mandatory	Voluntary
Kazakhstan	1997	Mandatory	Mandatory
Mexico	1997	Mandatory	Mandatory
Peru	1993	Voluntary	Voluntary
Poland	1999	Mandatory	Mandatory, aged <30 Voluntary, aged 30–50
UK	1988	Voluntary	Voluntary
Uruguay	1996	Mandatory	Mandatory, aged <40 and higher income

Source: Disney, Palacios and Whitehouse, 1999.

<sup>37</sup>See Disney, Emmerson and Tanner (1999), Emmerson and Tanner (1999) and Agulnik, Barr, Falkingham and Rake (1999) for a further discussion of the government's proposals.



TABLE 4  
Financing of UK Pension Rights, 1995

<i>Type of pension</i>	<i>Value of accrued rights (£ billion)</i>
Basic state pension*	605
SERPS	150
Unfunded public sector schemes	195
<i>Total unfunded schemes</i>	<i>950</i>
Funded occupational schemes	585
Personal pensions	165
<i>Total funded schemes</i>	<i>750</i>
<i>Total UK pension rights</i>	<i>1,700</i>

Source: Pension Provision Group, 1998.

introduction of stakeholder pensions is a continuation of the partial privatisation of the UK pension system that has been occurring since 1986.

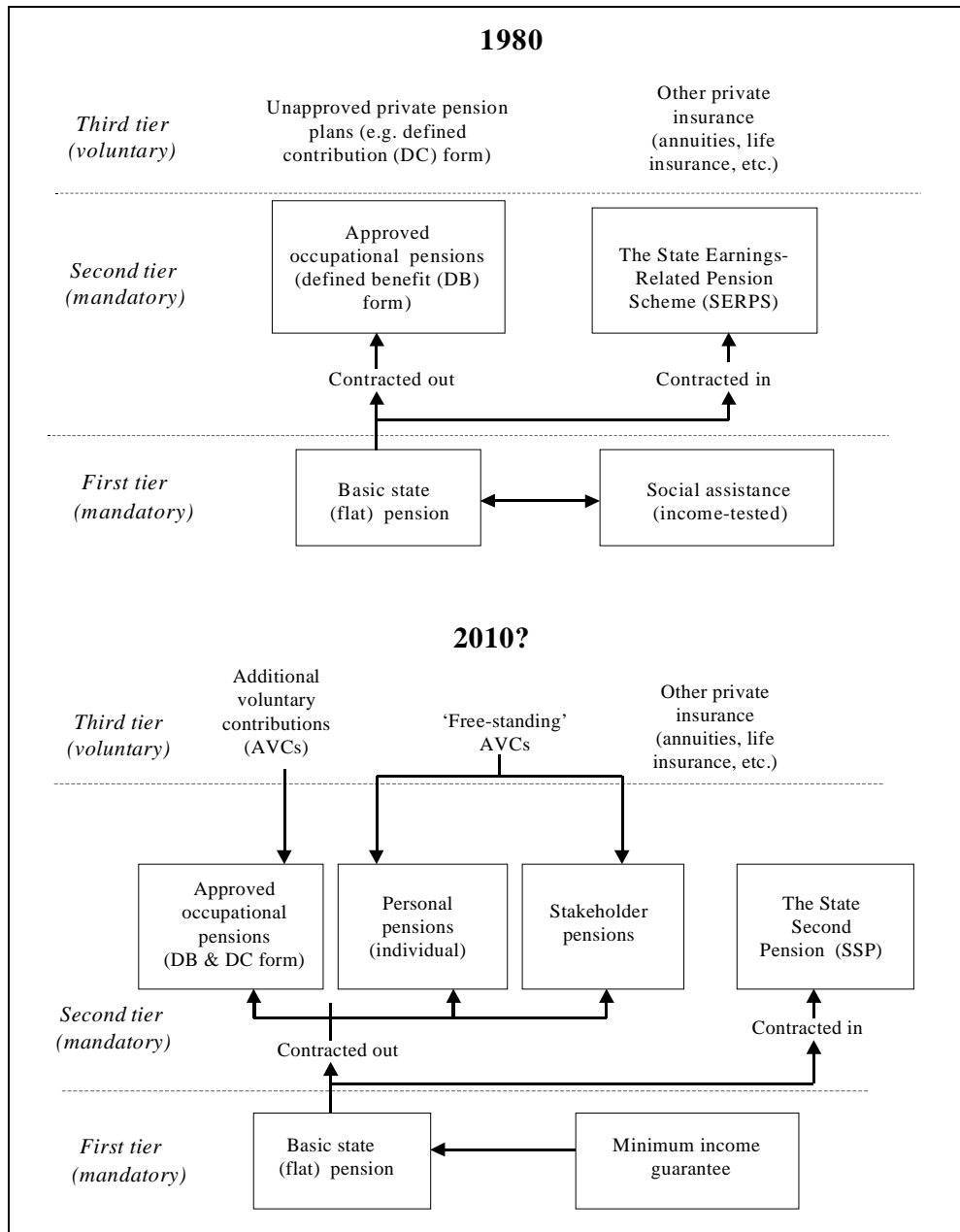
Some other countries, such as Argentina, have also opted for this voluntary, ‘sticks-and-carrots’ approach to reform. However, other countries have followed different routes.<sup>38</sup> Some have moved towards increased funding through compulsion. This can be done either by making such schemes compulsory for just new entrants to the labour market or just younger individuals, or, at the other extreme, by making schemes compulsory for all workers (Disney, Palacios and Whitehouse, 1999). The routes taken by various countries are shown in Table 3.

While the UK has adopted a voluntary approach towards private social security provision, the combination of ungenerous state benefits and financial incentives to ‘opt out’ into private pensions has led to the private sector playing an important and growing role. Table 4 shows precisely how important the private funded pension system is in the UK in comparison with the accrued rights in the state-run pay-as-you-go pension systems. State liabilities in 1995 were worth some £950 billion (around 130 per cent of GDP). Reporting to the government in 1998, the Pension Provision Group commented that ‘[unfunded] public sector schemes might be more suitable candidates than SERPS if a further move towards pre-funding were considered to be desirable’ (Pension Provision Group, 1998). The recommendation was ignored, however, in the subsequent move to the introduction of stakeholder pensions. Table 4 also shows that the remaining liabilities in state earnings-related pensions are small compared with assets in the private sector totalling £750 billion.

<sup>38</sup>For a discussion of such transitions, see, for example, World Bank (1994).

BOX 1

Two Snapshots of the UK Pension System



Source: Disney, Emmerson and Tanner, 1999.

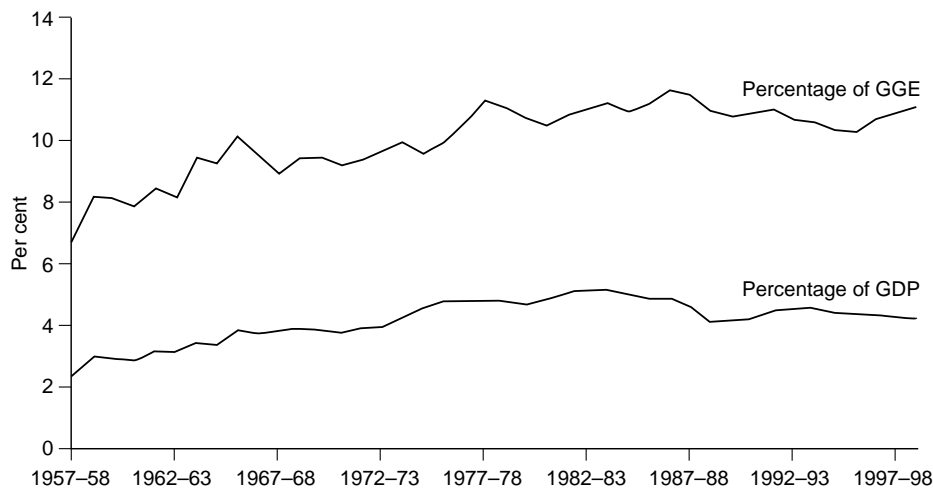
Box 1 shows how the UK pension system looked in 1980 when SERPS had just been introduced, and how it may look in 2010 given the proposals for what the government has described as a ‘radical reform of the whole pension system’ (Department of Social Security, 1998a). By 1980, the UK system consisted of a first tier involving the basic state pension and social assistance, which was the principal means-tested benefit for those on low incomes. The second tier of coverage consisted of private occupational pension schemes and SERPS. Above that was a third tier of voluntary saving for retirement. By 2010, the pension system could look far more complicated, due to the introduction in 1988 of the right for individuals to opt out of SERPS (and, more problematically, their employer’s pension scheme) into a defined contribution private pension. In addition, individuals with defined benefit pensions are now able to make additional contributions into private schemes through additional voluntary contributions (AVCs) and free-standing additional voluntary contributions (FSAVCs). The current government has also proposed the introduction of stakeholder pensions from April 2001. These reforms since 1980 have clearly increased individual choice, but at the cost of making the pension system far more complicated.

## *2. The Current Cost of the UK Social Security System*

The most expensive single item of government expenditure in the UK is the basic state pension, which costs some £32 billion per year (3.8 per cent of GDP), which is just under a third of the entire social security budget. In addition to this, pensioners receive state spending in the form of SERPS and also significant amounts of means-tested benefits. Figure 6 shows UK state pension spending as a share of GDP from 1957–58 to 1998–99. It indicates that, between 1957 and 1982, spending doubled from 2.5 per cent to just over 5 per cent of GDP. Since then, spending has fallen slightly, despite the introduction of SERPS and an increasing proportion of individuals aged over the retirement age. This is predominantly because entitlements were initially low as the scheme was immature, and since then, indexation changes, and indexation itself, have kept the costs down when expressed as a proportion of GDP. Public spending on pensions also rose as a share of total government expenditure between 1958 and 1982, despite the fact that total government spending was also rising as a share of GDP over this period. Since 1982, pensions spending has remained broadly constant as a share of general government expenditure (GGE), as there has been a slight decline in overall spending as a share of GDP.

The top half of Table 5 shows the breakdown of public pension spending items in the UK in 1998–99. Total direct state spending totals just over 5 per cent of GDP. In addition, elderly people receive other spending in the form of disability and industrial injury benefits, the cost of which is estimated at around

FIGURE 6  
Government Spending on Pensions,  
as a Percentage of GDP and as a Percentage of GGE



Note: Includes spending from the National Insurance Fund on the retirement pension and lump-sum payments to pensioners.

Source: Spending from ONS *Annual Abstract of Statistics* (various years). GDP from Office for National Statistics website. GGE from HM Treasury (1999b).

£5 billion (Pension Provision Group, 1998). They also receive a disproportionate amount of spending on health — for example, a large proportion of NHS spending goes towards Hospital and Community Health Services (HCHS), 41 per cent of which goes on the over-65s despite their population share of 16 per cent (Department of Health, 1999).

These figures for government spending do not represent the true cost to the state since they ignore the cost of tax expenditures on the elderly (Atkinson, 1987). Government estimates of these costs are also provided, in the lower half of Table 5, showing the cost to the government of these tax expenditures to be £20.5 billion, some 2.4 per cent of GDP. However, unlike the direct spending items, the costings of the tax expenditures come with substantial health warnings. First, the costs of income tax relief on occupational and personal pension schemes are the cost of the government not taxing either the contributions into the scheme or the pension when drawn, in comparison with taxing both. Clearly, if pensions were taxed in this way, it would be unlikely that anyone would hold retirement savings in this form, and hence the figures for income tax relief probably overstate the tax expenditures. A more appropriate figure would be the cost of the tax relief on the lump sum.

TABLE 5  
State Resources Spent on the Provision of Retirement Income, 1998–99

	<i>Billions of pounds</i>	<i>Percentage of GDP</i>
<b>Direct spending items</b>		
<i>Contributory benefits</i>		
Basic state pension <sup>a</sup>	32.0	3.8
SERPS	3.7	0.4
<i>Non-contributory benefits</i>		
Basic state pension <sup>a</sup>	0.0	0.0
Income support (minimum income guarantee)	3.6	0.4
Housing benefit	3.8	0.5
Council tax benefit	1.1	0.1
<i>Total</i>	<i>44.4</i>	<i>5.2</i>
<b>‘Expenditure’ on tax concessions</b>		
<i>Income tax allowances</i>		
Age-related allowances	1.1	0.1
<i>Income tax relief on:</i>		
occupational pension schemes	8.9	1.1
contributions to personal pensions <sup>b</sup>	2.5	0.3
<i>National Insurance contributions<sup>c</sup></i>		
Occupational schemes (DB)	6.0	0.7
Occupational schemes (DC)	0.1	0.0
Personal pensions	2.0	0.2
<i>Total</i>	<i>20.5</i>	<i>2.4</i>
<b>Total ‘expenditure’ on state support</b>	<b>64.9</b>	<b>7.6</b>

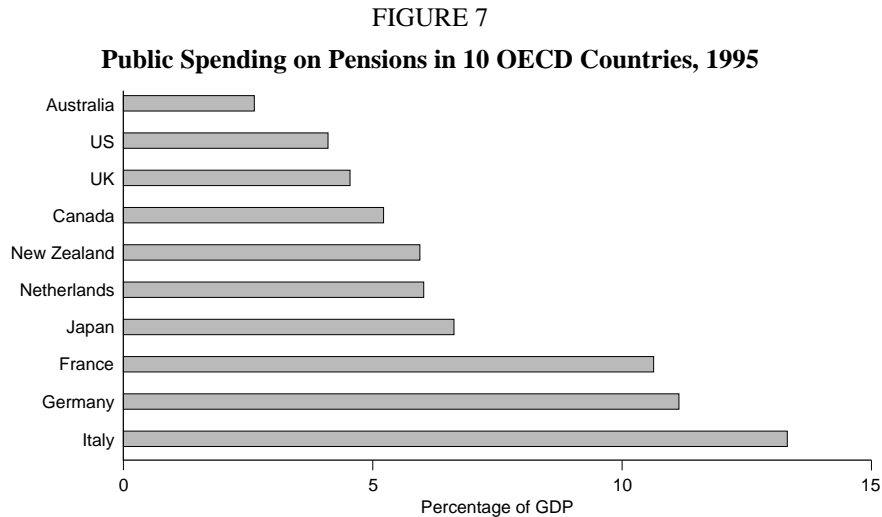
<sup>a</sup>Includes Christmas bonus.

<sup>b</sup>Includes retirement annuity premiums and FSAVCs.

<sup>c</sup>Relates to the cost of the contracted-out rebate only, not the cost of exempting employer National Insurance contributions.

Sources: Department of Social Security, 1999a and 1999b; Inland Revenue, 1999; HM Treasury, 1999a and 1999b.

In contrast, the tax expenditure for National Insurance contributions could well be an understatement of the exchequer costs. On the one hand, the cost of the reduced rate of National Insurance for those contracted out of SERPS should be zero, since an actuarially fair rebate would imply the schemes were worth the same. Work commissioned by the National Audit Office in 1990 found that, up to April 1993, the overall cost of reduced National Insurance from incentives paid to individuals’ personal pension funds, after netting off the reduced entitlements to SERPS, was some £5.9 billion in 1988 prices over the five-year period (Budd and Campbell, 1998). There is also a further subsidy to saving in a



Source: Roseveare, Leibfritz, Fore and Wurzel, 1996.

private pension. Employers' contributions to private schemes are exempted from both employer and employee National Insurance contributions. This exemption makes private pensions heavily tax-favoured assets when compared with others available in the UK. Moreover, there seems to be no justification for this differential tax treatment of employers' and employees' pension contributions. (For more on this issue, see Emmerson and Tanner (2000).) The net cost of these subsidies could be substantially higher than the £8 billion provided by the official government estimates, depending on the generosity of the contracted-out rebate compared with the SERPS entitlement forgone and the proportion of private contributions that are made by the employer.

Comparing the purely direct state expenditures internationally shows that the UK is a relatively low spender. Figure 7 shows OECD figures for public pension spending as a share of GDP. With the exception of Australia, which only provides a means-tested state pension system, the UK is currently one of the lowest spenders, alongside the US, Canada, New Zealand and the Netherlands. Those countries that opted for full social-insurance-style systems (France, Germany and Italy) have substantially higher levels of state spending. The issue of the future projected costs of the UK system will be discussed further in subsection 4. First, however, we look at the level and distribution of pensioner income that arise from the relatively low levels of state spending in the UK.

### 3. Current UK Pensioner Incomes

Perhaps the best description of a pension system is given by the level and distribution of income that it provides to individuals in retirement. The composition of pensioner incomes will also show the relative importance of state and private savings in the provision of retirement income. However, the incomes received by today's generation of pensioners clearly do not reflect the current pension system but instead are the product of the various reforms to the UK system over the last 40 to 60 years. For example, individuals retiring between 1998 and 2000 could have 20 years of contributions to the original SERPS which, as a result of subsequent cuts, is far more generous than the expected entitlements of younger individuals. As Table 2 has already shown, the UK state pension system provides relatively low levels of income which vary only slightly with an individual's working-life income.

This tells only half the story, however, since a significant and growing proportion of pensioner income comes from private sources. This has implications not only for the level of income received by the retired but also for how that income is distributed. Interestingly, despite the large degree of diversity between different countries' pension systems, Johnson (1999) found that the relative resources of elderly people were comparable. More precisely, out of eight OECD countries, only in Australia were average pensioner incomes not in the range 81–105 per cent of the average incomes of the working population. For example, in Italy, which operates an extensive (and expensive) earnings-related pension scheme, pensioner incomes were at the same level relative to the working population as found in the UK, the US, Canada and the Netherlands, all of which have substantially smaller public sector involvement.

TABLE 6  
Income and Real Growth in Income of Pensioners, 1979 to 1996–97  
(net income before housing costs)

<i>Pounds per week, July 1996 prices</i>						
	<i>All</i>	Quintile of the pensioner income distribution				
		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Pensioner couples</i>						
1979	155	94	109	127	162	243
1996–97	248	126	158	199	266	436
Real growth	60%	34%	45%	57%	65%	80%
<i>Single pensioners</i>						
1979	81	54	63	72	81	117
1996–97	129	68	93	110	138	205
Real growth	61%	22%	28%	47%	77%	85%

Source: Department of Social Security, 1999b.

Table 6 shows that, on average, pensioner couples now receive nearly £250 a week, while single pensioners receive almost £130. These figures represent real growth in pensioner incomes of some 60 per cent over the period 1979 to 1996–97 for both single pensioners and pensioner couples. This is substantially higher than the real growth in incomes for the entire population, which, over the same period, was just over 40 per cent. Looking across the income distribution, this real growth in pensioner incomes has occurred disproportionately among richer pensioners, with pensioner couples in the top 20 per cent of the pensioner income distribution now receiving an average of £436 per week. This contrasts to the periods from 1961–62 to 1971–72 and from 1971–72 to 1981–82 when pensioner income growth was highest in lower quintiles (Retirement Income Inquiry, 1996; Johnson and Stears, 1995).

TABLE 7  
Composition of Pensioner Income, by Status and Age-Group

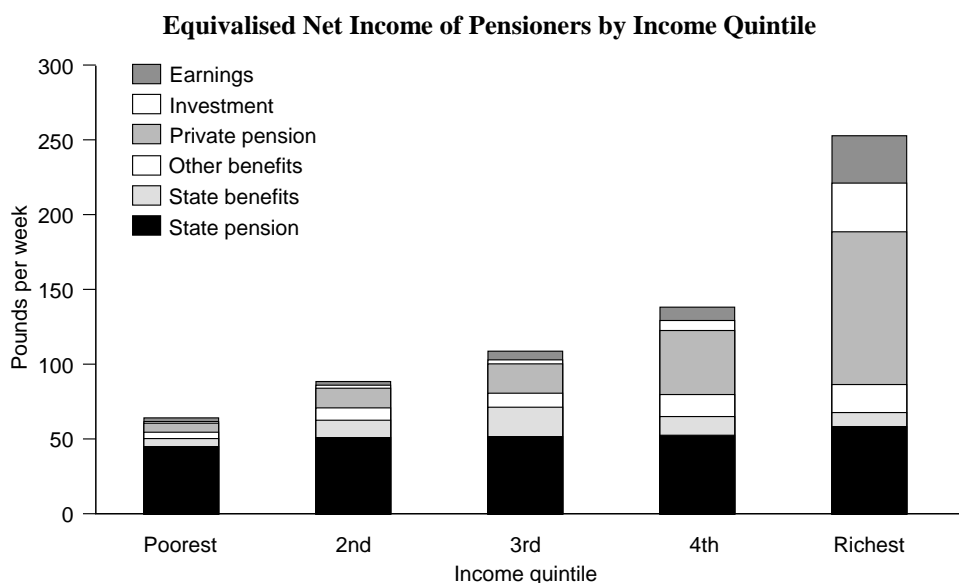
	<i>Per cent</i>				
	Age-group				
	60–64	65–69	70–74	Over 75	All over 60
<i>Couples</i>					
State pension	4.6	40.6	55.4	57.8	42.2
Means-tested benefits	12.8	3.5	3.3	5.4	5.7
Other benefits	28.8	12.6	5.4	5.7	12.0
Private pension	34.1	26.8	25.0	22.3	26.5
Investment	7.0	7.2	6.6	6.7	6.9
Earnings	12.7	9.4	4.3	2.1	6.8
<i>Single men</i>					
State pension	—	43.4	57.0	56.2	45.7
Means-tested benefits	36.2	10.8	11.5	12.7	15.3
Other benefits	29.9	12.3	4.4	5.2	10.1
Private pension	25.6	21.8	18.9	18.0	20.1
Investment	6.8	6.1	6.0	6.6	6.4
Earnings	1.1	5.5	2.1	1.2	2.4
<i>Single women</i>					
State pension	42.8	55.8	57.6	58.8	56.2
Means-tested benefits	17.0	14.6	15.6	17.7	16.7
Other benefits	11.5	4.6	4.5	5.6	5.9
Private pension	16.3	16.9	15.5	12.2	14.1
Investment	5.1	5.3	6.3	5.3	5.3
Earnings	7.3	2.8	0.6	0.3	1.5

Notes: Percentages may not sum to 100 due to rounding. 'Means-tested benefits' includes income from all means-tested benefits (income support, council tax benefit and housing benefit). 'Other benefits' includes all non-means-tested benefits, such as invalidity or incapacity benefit.

Source: Emmerson and Johnson (1998) using data from the 1995–96 Family Resources Survey.



FIGURE 8



Notes: 'State benefits' includes income support, council tax benefit and housing benefit. 'Other benefits' includes other, non-means-tested benefits such as invalidity or incapacity benefit.

Source: Emmerson and Johnson (1998) using data from the 1995–96 Family Resources Survey.

Table 7 provides a breakdown of the relative importance of each source of income, by age and pensioner type, and highlights how the mix of public and private pensions varies across the elderly population. Not surprisingly, younger pensioners have, on average, a higher share of their income from earnings, with the exception of 60- to 64-year-old men, who receive a considerable proportion of income from means-tested and other state benefits such as disability benefits. State pension income, which consists of both the basic state pension and SERPS, is a more important source of income for older individuals and single pensioners, mainly as a consequence of these types of pensioners being poorer on average. Finally, couples receive more income, on average, from private pensions.

Figure 8 shows how important each of these sources of income is for each quintile of the pensioner income distribution. Perhaps the most striking feature of the figure is that there is very little difference in income across the first four quintiles, while income in the richest quintile is substantially higher. Also clear from the picture is the flat-rate nature of the basic state pension since receipt is approximately the same in each quintile (small differences arise as a result of different average household sizes across quintiles having effects through the equivalence scale). Receipt of means-tested state benefits is highest in the third quintile, due to higher levels of housing benefit payments pushing pensioners

who are on low incomes and living in rented accommodation into higher quintiles. This would no longer be the case if a measure of income after housing cost deductions were used. The fourth quintile receives higher levels of income from private pensions than those lower down the income distribution, while the richest quintile receives higher levels of income from investment and earnings as well as higher levels of private pension income.

### Annuity Income

As discussed in Section II, annuitised forms of income are an extremely important part of the design of the UK social security system. In addition to income from state pensions and defined benefit private pensions, individuals also receive significant amounts of income from the annuitisation of savings from defined contribution private pensions. Prior to the introduction of approved personal pensions in 1988, the only individuals who could 'opt out' of SERPS into a DC scheme were the self-employed and those employees whose employer did not offer a DB scheme. These schemes were known as Section 226 plans. Among the current generation of pensioners with annuities, most are likely to have saved in a Section 226 plan rather than a personal pension scheme. However, in future, as younger generations reach retirement, annuity income from approved personal pensions will become relatively more important.

Table 8 shows how important annuity income is for the current UK population. Only a small proportion of individuals have income from annuitised wealth, although couples are more likely to have income in this form than single people. The increase in annuity receipt among younger age-groups is likely to reflect the increase in self-employment (and hence Section 226 pensions) over the last 20 years rather than the introduction of personal pensions in 1988, since most of the current generation of pensioners would have been better off in SERPS than in a personal pension. Among those who do have annuity income, it tends to be a relatively important source of income, providing on average £47 per week to single males, £36 per week to single females and £51 per week to couples.

Comparison of those with annuity income and those without shows that those with tend to have higher levels of education and are more likely to own their own homes. They also tend to have higher levels of income and higher levels of savings — for example, looking at 70- to 80-year-olds, 59 per cent of those with an annuity have savings of more than £20,000 compared with 24 per cent of those without annuity income (Banks and Emmerson, 1999). The average level of income among older groups will be affected by two forms of differential mortality. First, the group of single women will contain more women who are widowed as opposed to never married, with widowed women being more likely to have some annuity income since they may have inherited their deceased

TABLE 8  
Importance of Private Annuity Income in the UK

	Percentage with annuity	Number with annuity	Annuity income (£ p.w.) <sup>a</sup>	Proportion of total income from annuity <sup>a</sup>
<i>Single men</i>				
Under 60	0.2%	12,531	—	—
60–69	5.1%	24,987	54.10	0.222
70–79	3.9%	17,149	(38.57)	(0.171)
Over 80	3.7%	9,655	—	—
<i>All</i>	<i>0.9%</i>	<i>64,322</i>	<i>47.34</i>	<i>0.176</i>
<i>Single women</i>				
Under 60	0.2%	12,654	—	—
60–69	2.7%	24,341	42.69	0.165
70–79	2.1%	28,392	30.02	0.204
Over 80	2.4%	24,049	40.18	0.218
<i>All</i>	<i>0.8%</i>	<i>89,436</i>	<i>36.07</i>	<i>0.189</i>
<i>Couples</i>				
Under 60	0.3%	78,641	39.30	0.095
60–69	5.8%	245,783	53.36	0.172
70–79	5.3%	122,625	53.55	0.185
Over 80	3.3%	18,282	(41.29)	(0.168)
<i>All</i>	<i>1.2%</i>	<i>465,331</i>	<i>50.56</i>	<i>0.162</i>

<sup>a</sup>Annuity income is the average among all those with some annuity income.

Note: Parentheses denote sample sizes of less than 50. Sample sizes of less than 25 are not reported.

Source: Family Resources Survey, 1996–97 and 1997–98.

partner's entitlement. Second, those individuals with lower levels of lifetime income will be less likely to survive to older ages. Attanasio and Emmerson (1999) provide quantitative evidence on the size of this effect in the UK, showing that differential mortality effects are larger within the bottom part of the wealth distribution.

#### 4. The Sustainability of the UK Pension System

Perhaps the most contrasting feature of the UK pension system with that of its European neighbours is that the state pension system is entirely 'sustainable', at least in terms of its future costs. This is a direct result of the low level of generosity of the UK public pension system, highlighted in subsection 2 above, in combination with the fact that the ageing problem is far less stark in the UK than in some European countries (see Table 1). Several reforms introduced since

TABLE 9  
**Future Costs of SERPS after Various Reforms**

	<i>Billions of pounds, 1994–95 prices</i>				
	<i>1994–95</i>	<i>2000–01</i>	<i>2010–11</i>	<i>2020–21</i>	<i>2030–31</i>
Original regime	1.8	4.2	12.0	25.0	41.0
After 1986 Social Security Act	1.8	4.2	9.2	14.5	18.7
After 1995 Pensions Act	1.8	4.2	8.4	10.9	12.0

Sources: Government Actuary, 1994 and 1995; Retirement Income Inquiry, 1996.

1980 have had the effect of substantially reducing future state expenditures. In the terminology of Section II, these reforms have been a combination of ‘parametric’ reforms, which have substantially reduced future state liabilities (and hence the generosity of future state pensions), and ‘carrot-and-stick’ reforms aimed towards greater levels of voluntary private provision. The two most important of the parametric reforms were the indexing of the basic state pension to prices from 1981 and the rise in the retirement age for women from 60 to 65 by 2030 (see footnote 22).

In addition to increasing the retirement age, two other parametric reforms to SERPS are worth highlighting. Both have reduced future expenditures (and hence generosity) to less than one-quarter of what they would otherwise have been. The first was a reduction in the amount that a widow can inherit from her deceased partner’s pension from 100 per cent to 50 per cent from April 2000. A second and more subtle (yet very substantial) change was made to the way in which SERPS entitlements accrue through changes to the indexation of net contributions within the scheme in the reform of 1995. For more details, see Retirement Income Inquiry (1996).

One of the main reasons why these cuts were initiated is that, when SERPS was first introduced, projections for future costs were only calculated up to 2008–09, well before its maturity date. Table 9 shows the cost of SERPS at various stages and the degree to which its generosity has been reduced. If anything, these figures are underestimates, since it should be remembered that, due to continuous underestimates of longevity, the earlier forecasts were underestimates of what the true future costs would have been.<sup>39</sup>

Such reforms illustrate the main difference between the historical approaches of the UK and of the US in running their unfunded public schemes. In the UK, the policy has been to adjust contribution rates and future benefits continually in order to keep the system in balance, conditional on actuarial projections of future costs. In the US, on the other hand, the stance has been to hold contributions and

<sup>39</sup>Hemming and Kay (1982) produced forecasts that highlighted the extent of the future liabilities. Disney (1998) highlights the fact that official government forecasts for the future number of pensioners have consistently been revised upwards due to underestimates of longevity.

TABLE 10  
Long-Term Projections for the National Insurance Fund (July 1999)

	2000–01	2010–11	2020–21	2030–31	2050–51
<i>Demographic forecasts</i>					
Contributors (millions)	20.2	21.6	22.2	21.5	21.3
Pensioners (millions)	11.0	12.3	12.6	15.2	15.8
Support ratio	1.8	1.7	1.8	1.4	1.4
<i>State expenditure</i> (£ billion, 1999–2000 prices)					
Basic state pension	34.4	38.0	41.3	49.4	51.2
SERPS	5.2	9.9	12.6	14.9	15.8
Total expenditure <sup>a</sup>	48.6	57.7	65.9	76.2	79.0
Total expenditure as a share of GDP (%)	5.4	5.6	5.5	5.5	4.2
Joint employee and employer contribution rates (%) <sup>b</sup>	19.9	18.9	18.1	18.6	15.2
GDP per pensioner spending (1999–2000 = 100)	99.5	93.0	87.8	75.4	56.2

<sup>a</sup>Includes incapacity benefit, jobseeker's allowance and some other more minor benefits and expenses.

<sup>b</sup>Contribution rates exclude the 1.95 per cent currently payable to the National Health Service and are based on the rate structure introduced in the Social Security Act 1998.

Source: Government Actuary's Department, 1999.

benefits fixed and allow the scheme to accumulate a surplus or deficit over time — hence the partially funded nature of the US system.

Table 10 shows the latest Government Actuary forecasts for expenditure on state pensions. The support ratio, which is the ratio of contributors to pension recipients, is forecast to fall slightly between 2000 and 2010 and then rise as the retirement age for women is increased. It is then forecast to fall sharply beyond 2020. Expenditures on both the basic state pension and SERPS are forecast to rise in real terms due to higher levels of coverage. However, expenditure as a share of GDP — the measure of 'sustainability' more often used in the literature — is forecast to stay relatively constant. An important consideration in whether the system will follow current trends, however, will be whether these increasingly low levels of expenditures are politically sustainable, given increasing numbers of pensioners in the population receiving *relatively* less public pension. After all, the amount of GDP spent by the government per pensioner is forecast to fall to 75 per cent of what it is today by 2030. Under the current system, this is projected to fall even further, to around half of levels in

TABLE 11  
**Projected Future State Spending on Pensions as a Percentage of GDP**

	2000	2010	2020	2030	2040	2050	Net liability, 1995–2050 <sup>a</sup>
Canada	5.0	5.3	6.9	9.0	9.1	8.7	67.8
France	9.8	9.7	11.6	13.5	14.3	14.4	113.6
Germany	11.5	11.8	12.3	16.5	18.4	17.5	110.7
Italy	12.6	13.2	15.3	20.3	21.4	20.3	75.5
Japan	7.5	9.6	12.4	13.4	14.9	16.5	106.8
New Zealand	4.8	5.2	6.7	8.3	9.4	9.8	20.4
UK	4.5	5.2	5.1	5.5	4.0	4.1	4.6
US	4.2	4.5	5.2	6.6	7.1	7.0	25.7

<sup>a</sup>The sum of projected future deficits, each expressed as a percentage of projected future GDP.

Sources: Roseveare, Leibfritz, Fore and Wurzel (1996); Chand and Jaeger (1996) for net pension liabilities.

2000–01, by 2050. While the proposed State Second Pension will be more generous than SERPS to lower earners, the actual impact on government spending will depend on how many individuals take out stakeholder pensions. In any case, the overall cost of the reforms will depend on whether the government achieves its aims of indexing the minimum income guarantee in line with average earnings, and the Government Actuary's forecasts do not include spending on means-tested benefits for the elderly.

An international context for the projected trends in UK public pension spending is provided by Table 11. The final column of the table is taken from Chand and Jaeger (1996) and shows the sum of projected future deficits (each expressed as a percentage of projected future GDP) over the 55-year horizon of their study. These vary hugely across countries. The future liabilities in the UK system are by far the smallest and are actually projected to fall after 2030 once the ageing of the population begins to slow down. In contrast, France, Germany, Italy and Japan, all of which already have relatively expensive public pension systems, face costs increasing by 50 per cent or more over the same horizon.

It is clear, then, that the issues with future public spending on pensions are not the same in the UK as in some of the other European countries. Whereas other public pension systems may face increasing costs in the medium to long term, these will, if current policy persists, not occur in the UK. In contrast, therefore, the issue for the UK will be whether the particular mix of public and private, funded and unfunded, provision that has arisen as a result of two decades of continual reform will be able to deliver the redistribution required.

#### IV. CONCLUSIONS

Given that there is a vast literature on all aspects of pensions and pension spending, any attempt to summarise it is fated to be at least partially inadequate. It is fair to say that economists have learnt a lot in the last 20 years about the issues involved. But there is also a sense in which diminishing returns to scale may have begun to set in. Certainly, in the international academic debate, the need, and options, for reform are relatively well understood, although there may be less understanding and agreement on this in a country- (or continent-)specific policy sense, where more applied research is needed in many cases. In particular, more needs to be known about financial markets and the relative returns (and riskiness of returns) on risky assets in comparison with safe assets and in comparison with labour income, since such calculations underpin our estimates of how large any transition costs from pension reform may be. Ultimately, however, conditional on policymakers' knowledge of pension issues being at the 'frontier', many developed countries are at the point where value judgements need to be made in order to set the direction for policy on future public and private pensions.

The message we take from the 'sustainability' debate is that, if current trends continue, there is no easy way out. Funding is not necessarily the whole answer, since asset prices may adjust adversely. Movements towards funding may not be a feasible option in some scenarios as a result of substantial transition costs and political issues. But something has to give, because the ageing of the population is inevitable. Not counting large-scale population shocks, however, there are still a number of margins on which systems could adjust. Two of these are the relative generosity and structure of pension systems. But others are departures of trends in labour market behaviour, social preferences or economic growth from those experienced in recent years. The future of unfunded pension systems is still, in every sense, uncertain.

The UK system combines a particular mix of public and private pension provision that makes it an interesting but complex system to study. In 1984, Dilnot, Kay and Morris argued that British social security was like a 'patchwork quilt falling apart at the seams'. Since then, the pension component, at least, has become substantially *more* complicated. We have shown how public and private pension spending now combine to deliver a mix of income sources to elderly households, and that the particular mix varies widely across population groups.

One striking feature of the evolution of the UK system over the last 20 years (i.e. since the introduction of SERPS) is the number of reforms that have been introduced with little or no prior debate. All genuine economic analysis has been conducted after the reforms were implemented. This is in stark contrast to the US approach of having a long and detailed debate with, as yet, no reform at all. Successive reforms to the UK system have left it complicated and, to some extent, unwieldy. In our overview, we have had to discuss, or at least mention,

nine distinct pension vehicles (basic state pension, SERPS, occupational pension schemes, personal pensions, AVCs, FSAVCs, and the imminent stakeholder pensions, minimum income guarantee and State Second Pension). It could be argued that the only saving grace of such a complicated system is that no one understands it, thus making it (politically) easy to reform. But the heterogeneity in pension histories created by the evolution of the UK system, which has never been in equilibrium and will not be for some time, will inevitably result in difficulties in designing future reforms that meet well-defined economic and social goals without such reforms either becoming expensive or creating groups of losers.

To the extent that there are distortions in pension systems, their degree is determined by individuals' perceptions of the economic environment. With imperfect or costly information, individual choices are more likely to be suboptimal as the complexity of the system increases, as was clearly demonstrated in the mis-selling scandal surrounding the introduction of personal pensions. Policies relating to financial information and education (i.e. aiming to improve public understanding of the pension system rather than to reform the system itself further) may therefore be becoming increasingly important in the UK, and are certainly, in our opinion, a candidate for interesting future research.

In our overview, we have also shown that the international situation is diverse, in terms of both the structure of systems and the way in which their costs are projected to change, given current trends. In the US, the funding problem is not as severe as in some other countries, but there is still a perceived need for reform, and potential reforms are extremely well debated. In Europe, this is not the case. Applied studies examining the options using rigorous macroeconomic and microeconomic analysis, in the way that has been done in the US, are only just beginning to emerge. This may be partly because situations within Europe are very diverse. Some projected liabilities are massive, others less so. But such differences mean that expectations of potential further integration of economic and financial systems must surely play a role in informing policy analysis, given the length of horizons over which pension reforms need to be analysed. Our view of the applied European literature is that there is still a lot to be learnt before the options are clear.

Consideration of European differences is particularly interesting in another dimension. We have shown that the future liabilities of several countries are potentially large, but it is important to remember that, to some extent, this may be because those countries have chosen, through the political process, to have generous pension arrangements. While it is clear that many countries may eventually reduce the generosity of their pension schemes, this will only occur as a result of the political process in those countries. Some countries may choose to retain relatively generous systems and simply increase the contribution rates of future generations. While this may be less popular with younger workers, who will be making higher payroll contributions as a result, the political voice of the



retired should not be ignored. This may be particularly important, given that they will make up a larger proportion of the voting population and may also tend to focus their votes more on certain issues.

Given the advanced and voluminous debate on economic issues, it seems to us that many of the most important research issues for the future of public pensions now relate to either political economy or financial markets, not necessarily the economic design of pension policy *per se*. This is particularly the case if one considers likely routes through transition to funding, since such routes depend heavily on discounted intergenerational altruism, the size of various groups of the population and the way in which the political system transmits these groups' preferences to government policy. Such topics are beginning to come to the fore, and the surveys of social security by Mulligan and Sala-i-Martin (1999a, 1999b and 1999c) point to possible directions in this area.

Finally, we would point out that one of the distinguishing characteristics of pensions is that they are long-term investments, often with fixed costs, so individuals can get locked in (either explicitly or implicitly). In this scenario, there are clear arguments for stability and simplicity of economic systems, whether public or private. What is required is an intertemporal economic environment that allows individuals to plan their consumption, labour supply and saving choices. At the very least, social security reforms, major or minor, should not be made to aid the management of short-run or even medium-run fluctuations in government finances. Nor should they be made on ideological grounds alone — for example, as a result of some belief in the inherent value of private provision. Whilst the dynamic issues mean that early reform can minimise the scale of the intervention needed, having to introduce subsequent reforms as a result of inappropriate initial changes can cause further problems, given the extent to which there is state dependence in the system as a result of the nature of medium- to long-run intertemporal investment decisions that lie behind individuals' choice of pension arrangements.

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