Pensions policy in the UK: An economic analysis

Dilnot, Andrew and Disney, Richard and Johnson, Paul and Whitehouse, Edward

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PENSIONS POLICY IN THE UK

An Economic Analysis

Andrew Dilnot
Richard Disney
Paul Johnson
Edward Whitehouse

The Institute for Fiscal Studies
7 Ridgmount Street
London **WC1E 7AE**
Tel. +44 (0)71-636 3784
Fax +44 (0)71-323 4780

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Preface

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Andrew Dilnot
Director, IFS
Richard Disney
Research Fellow, IFS
Professor of Economics, University of Kent
Paul Johnson
Project Manager, IFS
Edward Whitehouse
Senior Research Officer, IFS

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CHAPTER 1

Summary

Pension provision is of vital importance to the state, all individuals and employers. Through taxes, contributions and payments, it affects nearly all of us at nearly all stages in our lives. Yet it is little understood and rarely subject to rigorous analysis. In this book, we attempt to describe the main components of pension provision in the UK, the problems that they suffer and the policy issues that are raised. We do so within the context of an economic analysis which allows new light to be shed on the subject and useful conclusions to be drawn.

In this first chapter, we outline briefly the contents of the rest of the book. The intention is to provide the reader with a guide as to what issues are covered, and where they are covered, in the main part of the book. It is by no means exhaustive as a summary of the contents nor is what is included here intended in any way to act as a substitute for the far fuller discussions contained in the remaining chapters.

Pensions and Pensioners in Britain (Chapter 2)

Both the state and private sector play vital roles in providing pensions in the UK. Virtually all of the 10 million individuals over state pension age receive the basic National Insurance pension from the state and the majority also receive at least some occupational pension from previous employers. Provision of income by the state is by no means confined to the basic pension and around a third of pensioners receive means-tested benefits in addition.

The role of private pensions has grown over the whole of the post-war period, and especially rapidly in the last decade or two, with increases in both benefit coverage and benefit levels. Occupational pensions now cover around half of all employees at any one time. Furthermore, investment incomes have increased substantially and around one-half of pensioner income now comes from private sources, and this proportion continues to grow. In the future, personal pensions will add to this private provision.

While pensioner incomes as a whole have grown, this growth has not been uniform; there has been a noticeable increase in the inequality of pensioner incomes as the frequency and level of private incomes have risen. Despite this increased inequality, living standards for the group as a whole have tended to increase, and retired people are now far less likely to be found in the lowest regions of the overall income distribution than they were 20 or even 10 years ago.

Having grown rapidly since the war, the number of pensioners is now growing only slowly, and for some time yet the number of working age individuals will continue to rise in the UK. Unlike many of our competitor nations, we do not therefore face a rapid decline in the ratio of individuals of working age to those of pension age, which was 3.3 in 1991 and should still be 3.3 in 2020. Thereafter, however, the support ratio will fall rapidly to around 2.4 by 2040, as the 'baby-boom' generation retires and its own relatively low fertility is reflected in fewer individuals of working age.

Economics of Pension Provision (Chapter 3)

The distinguishing feature of a pension is that it provides a guaranteed income stream from retirement age until death. By guaranteeing income until death, a pension provides the recipient with insurance against living a long time. Without such insurance, it is very hard to manage savings to ensure an adequate income for the remainder of one's life.

One natural question for economists to ask is 'why is the state involved throughout the developed world in providing pensions?'. Two commonly cited answers are poverty alleviation and

paternalism. Poverty alleviation is perhaps the principal argument for most basic state provision of pensions, although the nature of the state's role will change as the underlying distribution of income changes. The argument for state intervention for paternalistic reasons rests on the assertion that in the absence of state activity, individuals will fail to provide themselves with the level of pension that is optimal, that they would reach retirement and regret having saved as little as they had. When discussing state provision, we note that there is redistribution both within and across generations, sometimes intended but often unintended, and show that the outcomes are complex and little understood.

There has been a long-running debate on pay-as-you-go (PAYG) versus funding of pensions. We argue that funding of state provision is not very sensible, so the main determinant of the level of funding of pension provision is the relative size of private and state activity. We also note that the transitional effects on government cash flow of any attempt to move to funding would be large and probably unsustainable.

We next discuss sources of market failure and the possible use of particular types of pension contract to alleviate such problems. Some arrangements such as defined benefit occupational pensions can create inefficiencies themselves. Defined benefit schemes in which the pension depends on number of years of service and final earnings penalise job movement; this could create labour market inefficiencies by reducing labour mobility. On the other hand, the efficiency of job contracts could be enhanced.

The timing of retirement varies greatly, and has changed rapidly in recent years, with many men especially retiring earlier. Decisions about retirement will be a function of the structure of both private and state pension provision, the macroeconomic environment, individual wealth, and labour market experience.

Finally in this chapter we discuss the taxation of private pensions. We outline possible schemes for taxing pensions, and note that the UK system is close to treating pension provision as the deferral of consumption. We argue that this is the correct view to take of pension taxation.

How Much Are Supplementary Pensions Worth? (Chapter 4)

In the UK, individuals have to choose between up to three types of supplementary pension provision. It is important to understand how to value the available options such that rational choices can be made between them. It is therefore to the complex issue of valuing supplementary pensions that we devote Chapter 4.

We begin with a full discussion of the determination of SERPS entitlements and the corresponding, although not identical, guaranteed minimum pension (GMP). As well as showing how these should be valued, this illustrates effectively the great complexity of the scheme. We then discuss the valuation of defined benefit occupational pension rights. Two extreme approaches have been taken in the past by economists: valuing pensions either on the assumption that individuals will leave their current jobs immediately, or assuming that they will stay in their current job until retirement. We develop an alternative based on expected job duration, which should reflect more accurately the true value of defined benefit pension rights. We show that these differences in approach can create large variations in valuation, since future job tenure is a critical determinant of future pension rights.

Finally in this chapter, we examine the choice facing individuals between the State Earnings-Related Pension Scheme (SERPS) and opting out into an approved personal pension plan. We show the standard result that young individuals are likely to do best in a personal pension because of the effect of compounding on their accumulating fund, but that for most there will be an age at which it is optimal to switch back into SERPS. The higher the rate of return on investments relative to the growth of earnings, the more attractive a personal pension becomes. We demonstrate that the gains from optimal switching from SERPS to a personal pension and vice versa can be large.

Choice of Supplementary Pension Arrangements (Chapter 5)

Chapter 5 looks in more detail at some of the characteristics of different types of pension scheme, and at attitudes of employees and employers to these options.

Uncertainty is inevitable in pension provision, but there is not always a clear recognition that there are many different sources of uncertainty, which affect different types of scheme in different ways. We identify six sources of uncertainty (capital market, earnings, labour market interruptions, social insurance, job tenure and inflation) and discuss the impact of each of these on alternative forms of pension. No type of pension is free from uncertainty.

Our discussion of attitudes of both employees and employers to pensions concludes that, in general, both groups seem surprisingly well informed, although there is some evidence that pension rights are overstated by employees and there is remarkably little concern about the effects of inflation on pension values. The one major area of disagreement between employees and employers seems to arise from the preference of the latter for defined benefit occupational schemes, a preference not shared by employees.

The Future of Basic State Provision (Chapter 6)

If we continue with the current policy of price indexation of the state pension, there will be no need to raise tax rates to pay for pensions, even once the number of elderly starts growing rapidly, because the impact of economic growth on tax revenue will more than offset the impact of demographic change. But if we do continue with price indexation, the pension will continue to fall, relative to general living standards, to an unacceptable level if it is expected to provide an income adequate to live on. Had this been the policy for the whole of the post-war period, the basic pension would be a little less than £24 per week now, rather than its actual

£57.60. Were we to attempt to keep the pension constant as a fraction of living standards, or even to see it return to earlier higher levels, National Insurance contribution rates would need to rise substantially: by 6 per cent and almost 15 per cent respectively.

Given the growth of private income, such a route seems inappropriate irrespective of any political constraints. Relying more heavily on income-related transfers from the state seems an obvious alternative, but such benefits face problems of non-take-up, administrative costs and the creation of disincentives to save. One response to these problems would be to integrate the flat-rate National Insurance pension and means-tested income support systems into a single benefit, and then apply a withdrawal rate somewhat below the current 100 per cent rate on income support in an attempt to mitigate the incentive effects on saving. Within an integrated benefit, there would be greater scope to shift funds from the flat-rate element to the income-related, thus increasing the incomes of those at the bottom of the distribution without necessarily increasing aggregate expenditure.

The Future of Supplementary Pension Provision (Chapter 7)

The nature of supplementary pension provision has changed dramatically since the legislative reforms of 1988. The biggest single issue in this area now is the balance between defined benefit (DB) and defined contribution (DC) schemes. Recent years have seen rapid growth in the numbers covered by DC schemes, despite the prevalence of the belief that DB schemes are in some sense best. In principle, a DC scheme can mimic any characteristic of a given DB scheme, making the assertion that DB schemes dominate seem odd. We show that between 50 and 60 per cent of job tenure spells would produce better pension returns from a DC plan than a DB plan, primarily because of the redistribution implicit in many DB plans from those with short job tenures to those with long job tenures, and from the low paid to the high paid.

We discuss the arrangements for contracting out of SERPS, and argue that there is a strong case for age-related rebates to National Insurance contributions, at least for defined contribution pensions.

Finally, we note that so long as employers continue in the main not to be willing to contribute to a personal pension plan for their employees if they offer an occupational pension, many individuals have little genuine choice of pension provision. Any action by government to force the availability of such choice could have a very dramatic impact on the occupational pension sector.

CHAPTER 2

Pensions and Pensioners in Britain

2.1 Introduction

Pensioners and their pensions are of enormous importance to public policy. Current pensioners represent around a quarter of the electorate, and their number will grow in the next century. All of us hope to live to retirement, and the great bulk of us will. Spending on the flat-rate retirement pension is by far the largest single item of public spending, and in addition many pensioners receive income from private sources, which has grown dramatically in the post-war period and now on average matches benefit income. More than three-quarters of current employees are members of some sort of private pension arrangement. The interaction between state provision and private provision is complex, not least because of the expected duration and complication of the underlying arrangements for both state and private provisions. Concerns about the likely future cost of state provision, the regulation and effectiveness of private provisions, and poverty amongst the elderly come together to make analysis of likely outcomes on current policies, and the effects of alternatives, vital. Our aim in this book is to provide a guide to the debate from the perspective of economics.

Although this is a book about pensions and pension policy, we should stress that the subject matter does not only, or even principally, affect those already retired. Pensions are long-run contracts, and by the time they are in payment, little can be done to alter their structure. If we are to change the present structure of pensions in the UK, we must focus on the design of sensible systems for those who are currently of working age.

In the remainder of this chapter, we will first describe the current system of basic state provision and its development, and then do the same for supplementary state provision and for private provision, which are intimately linked. We next discuss likely demographic developments. Finally in this chapter, we examine the development and current composition and distribution of pensioner incomes.

2.2 Basic State Provision in Britain

Despite decades of debate over poverty in old age and the best way of ameliorating it, not until the passage of the Old Age Pensions Act in 1908 was any systematic, centrally organised provision for the elderly in Britain introduced. The 1908 scheme was not a 'social insurance' system. It was means-tested and non-contributory. Entitlement started at 70 and was restricted to the 'respectable' poor.

It was the 1925 Widows, Orphans and Old Age Contributory Pensions Act that introduced a contributory social insurance scheme for the over-65s, although means-tested non-contributory benefits continued to be paid to those over 70. Membership of the contributory scheme was compulsory only for employed manual workers and other workers earning below a prescribed amount. The current unified compulsory social insurance scheme was instituted following the Beveridge Report of December 1942.[1]

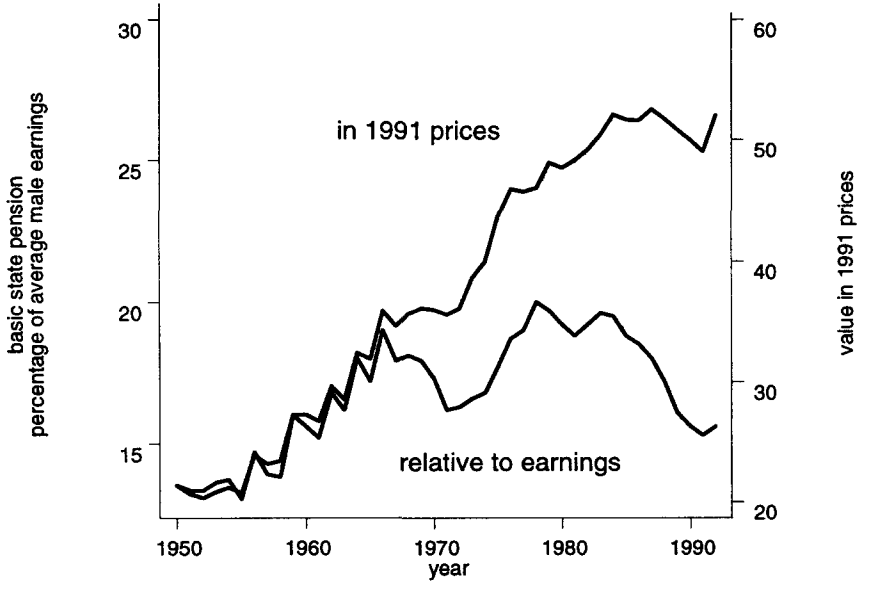
Beveridge had intended that the pension be set at a subsistence level and indeed that it should only reach that level after a 20-year transition period to allow financial problems to be overcome. He had also envisaged that its level should rise only in line with prices — this being consistent with his idea of the state pension as a minimum subsistence income. In fact, benefits rose somewhat more quickly than prices, more than doubling relative to prices between 1948 and 1973. This caused financing problems,

1. See Wilson (1974) and Dilnot, Kay and Morris (1984) for more discussion of the development of the post-Beveridge system.

especially because the pension was paid for by flat-rate contributions. By the end of the 1950s, these were bearing very heavily on the low-paid. The wholly flat-rate basis for contributions was partly abandoned in 1961, though a significant flat-rate element remained until 1975. Even today, following further reforms in 1984 and 1989, there is effectively a flat-rate 'entry charge' of 2 per cent of the National Insurance lower earnings limit (LEL), equivalent to £1.14 per week, which becomes payable once earnings reach the LEL of £57 per week. This is in addition to the charge of 10 per cent of earnings on earnings between the LEL and the upper earnings limit (UEL) of £430 per week.

FIGURE 2.1

Basic State Pension relative to Earnings and Prices, 1948–93



Source: Department of Social Security (1993c).

Figure 2.1 shows how the pension has changed relative to earnings and prices. During the 1950s and 1960s, although the pension rose more quickly than prices, the system of indexation was essentially *ad hoc* with no set rules for annual revaluations. During much of the 1970s, the rule was to increase the pension in line with price inflation or earnings inflation, whichever was the greater. Since the early 1980s, the pension has risen only in line with prices and as a result its value relative to average earnings has fallen back. In 1977, it was worth around 20 per cent of average male earnings. In the early 1990s, it stands at nearer 15 per cent of average male earnings.

CURRENT BASIC STATE PROVISION

Basic, or 'first-tier', state provision for the elderly is easily the most expensive part of the entire social security budget. The flat-rate pension alone will cost over £26 billion in 1994–95, while other benefits for pensioners — including means-tested income support, housing benefit and council tax benefit — will absorb a further £11 billion.

In May 1992, 1.5 million people over state pension age were in receipt of income support (IS). The great majority of these —

TABLE 2.1

Numbers of IS Recipients over State Pension Age, by Age and Sex, in May 1992

Thousands

	Couples	*Single men*	*Women*
60–64			90
65–69	29	36	116
70–74	20	26	146
75–79	25	38	242
80+	38	78	573
All	112	178	1,167

nearly 1.2 million — were single women. As Table 2.1 shows, receipt was concentrated among women and the very elderly. Only a tiny number — about 150,000 — had no retirement pension in addition to their income support.

There were an additional 1.2 million households where the head was over 60 receiving housing benefit (HB); over a million of these were in receipt of retirement pension. Finally, there were 1.9 million households with a head over 60 receiving community charge benefit (CCB) but not receiving income support; 1.7 million of these were retirement pensioners. It is likely that most of those receiving HB were also receiving CCB. Hence there would have been about 3.1 million pensioner benefit units receiving some form of means-tested supplement to the basic state pension.

The large number of pensioners receiving some form of means-tested benefit partly reflects the relative levels of the basic state pension and the means-tested minimum income support — the latter is worth more than the former — and partly reflects the help available to pensioners with their housing costs. The basic pension is clearly not intended by itself to be adequate to cover such costs. The relative levels of the basic pension and income support in 1994–95, for pensioners of different ages and marital statuses, are shown in Table 2.2. For older married couples, the difference amounts to nearly £15 per week. The smallest difference, for single pensioners under 75, is still over £6 per week. A single pensioner under 75 would thus need over £300 per year

TABLE 2.2

Rates of Income Support and Basic Pension, 1994–95

	Retirement pension (per week)	*Income support (per week)*	*Gap (%)*
Single, under 75	£57.60	£63.95	*11*
Couple, under 75	£92.10	£99.25	*8*
Single, 75–79	£57.60	£66.05	*15*
Couple, 75–79	£92.10	£102.10	*11*
Single, 80+	£57.85	£70.40	*22*
Couple, 80+	£92.35	£107.00	*16*

of private income just to escape income support, let alone council tax benefit or housing benefit, while a couple over the age of 80 would need nearly £800 per year of private income to escape income support.[2] The gaps between the basic pension and income support have become wider since income support was introduced in 1988: for married couples under 75, from 7 to 8 per cent of the basic pension; for couples between 75 and 79, from 7 to 11 per cent; and for couples 80 and over, from 12 to 16 per cent.

COVERAGE OF THE FLAT-RATE PENSION

The basic pension is not quite universal — it is not enough just to be over pension age to be able to claim the full pension. Certain contribution conditions must be satisfied for an individual to be eligible for full receipt.

The main condition is that pensioners should have made National Insurance contributions (NICs) for around nine-tenths of their working lives — 44 years for men and 39 years for women at the current state pension age. The severity of this test is, however, reduced by a number of provisions. Contributions are credited for periods in education or training and periods of claiming some social security benefits, notably benefits in respect of periods of unemployment or disability. For those out of the labour market for a period in order to care for children or sick relatives, home responsibilities protection[3] (HRP) reduces the number of years of contributions necessary to obtain a full pension. If contributions are inadequate to provide entitlement to the full pension, a reduced pension can be paid subject to a minimum of a quarter of the full pension level.

One further factor has reduced the proportion of women entitled to a pension in their own right, and that has been the

2. A pensioner couple both aged 68, paying rent of £40 per week, would need private income of around £70 per week to exhaust their housing benefit.
3. Home responsibilities protection gives credits for years throughout which an individual received child benefit for a child under 16, or income support for looking after an elderly or disabled person without being 'available for work', or cared for a person receiving attendance allowance.

existence of the so-called married women's rate of NICs. Until 1978, married women could opt to pay a special low rate of NICs which did not confer entitlement to the pension. Those who so opted prior to 1978 have been allowed to continue paying the lower rate (3.85 per cent of all earnings, *including earnings below the LEL*, at present). By April 1991, there were around 700,000 women paying this reduced rate, down from 4.1 million at the end of the period when it was possible for new optants to pay the reduced rate.

The combination of the availability of the married women's rate of NICs and the non-existence of HRP for periods of childcare before 1978 means that among current pensioners, women are far less likely than men to have entitlement to the full pension. In fact, over 95 per cent of men over pension age receive the full basic pension whereas only 27 per cent of women over pension age receive the full pension on the basis of their own contributions. In addition, virtually all widows receive the full basic pension, but generally on the basis of their late husband's contributions. Among married women, 1.9 million receive only the dependant's addition to their spouse's pension.

This situation will change as the effects of HRP and the abolition of the married women's NI rate work their way through and increasing numbers of women become entitled to the full basic pension in their own right on retirement. Whereas at present only around 45 per cent of married women are entitled to some flat-rate pension on the basis of their own contributions, and over half of these receive more from their husband's contributions, Government Actuary (1990) estimates that by 2010, all married women will be entitled to some pension on the basis of their own contributions. Even then, a third will still be entitled in their own right to less than the amount to which their husband's contributions entitle them, although this proportion is assumed to fall to 10 per cent by 2050.

By this time, the gaps in most people's contributions, by reason of unemployment or caring or sickness, will effectively be filled by special provisions. Virtually the only groups not to be covered will be those who have lived off inherited wealth and some of those who have worked abroad. This development leads naturally to a question about what need there is for a contributory system at all.

The contributions records of all employees are currently kept for the period of their entire working life by the Contributions Agency, which costs nearly £200 million per year to run. The relationship between contributions and benefit receipt, especially in respect of the basic pension, is becoming more and more distant. Would payment of basic pension simply on the basis of some residency requirements not make far more sense?

One problem with such a move away from maintaining contribution records would be the implications for the State Earnings-Related Pension Scheme (SERPS), which also relies on contribution records. It is to a consideration of this supplementary state provision, and of private provision, that we now turn.

2.3 Supplementary Provision in Britain

After the implementation of much of the Beveridge Report in 1948, the compulsory pension system consisted only of the first tier: the basic state pension and means-tested National Assistance. In 1961, in response to cost pressures and consequent changes in the contribution structure, the graduated pension was introduced in addition to the basic pension, offering a modest earnings-related state pension. The current supplementary state pension provision was introduced in 1978, following the Social Security Act 1975.

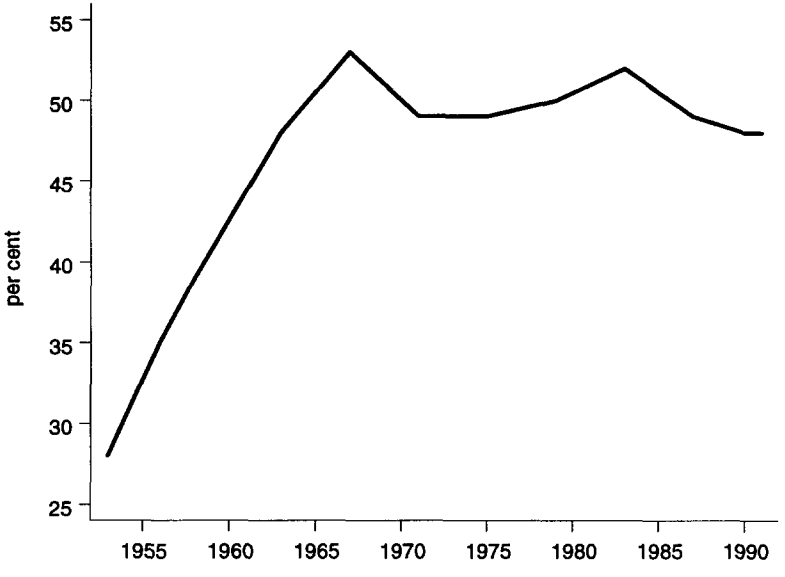
Prior to the introduction of state earnings-related pensions, there was a rapid expansion of occupational pension provision, as shown in Figure 2.2. Between 1953 and the 1967 peak, occupational pension coverage expanded from 28 to 53 per cent of employees. Since then, coverage has tended to fall slightly, though it is apparent that there has been a cyclical component to pension membership as well as a trend since the 1960s.

THE STATE EARNINGS-RELATED PENSION SCHEME

The Social Security Act 1975 introduced SERPS. To avoid substituting for private sector provision, occupational schemes were allowed to contract out of SERPS. If the scheme agreed to provide a guaranteed minimum pension, related to individual

FIGURE 2.2

Occupational Pension Coverage, 1953–91



Note: Percentage of employees who are members of occupational pensions.
Source: Pension Law Review Committee (1993).

average lifetime earnings (*inter alia*), and to forgo some SERPS benefits (equal to the amount of the guaranteed minimum pension), the National Insurance contribution levied on both employers and employees was reduced. This is the so-called contracted-out rebate which was initially set at 7 per cent of earnings (between the lower and upper earnings limits for National Insurance contributions). The current rate, applying from 1993–94 onwards, is 4.8 per cent.

Employees earning more than the LEL for NICs (£57 per week for 1994–95) pay Class 1 NICs and earn entitlement to SERPS as well as the basic pension unless they are contracted out. Members of SERPS will receive SERPS pensions of 20 per cent of their average earnings between the LEL and the UEL through their working lives. The UEL must by law lie between 6.5 and 7.5 times

the basic state pension, and stands at £430 per week for 1994–95 — around 120 per cent of average male earnings.

SERPS payments will be much less generous in the next century than was intended when the scheme was first introduced, following amendments made in Social Security Act 1986. Prior to the 1986 Act, SERPS was to provide 25 per cent of average earnings in the best 20 years of working life, rather than 20 per cent of average earnings over the whole working life as now.[4]

The current cost of SERPS is only around £2 billion per annum, because relatively few of the retired have significant entitlements. The cost will grow steadily until the scheme reaches maturity around 2030, when almost all of the retired will have complete SERPS entitlements. Although the cost will grow, SERPS entitlements will for many be rather small fractions of past average earnings if current procedures for indexing the UEL are continued. The UEL is at present increased in line with the LEL, which is itself tied to the flat-rate pension. All three have therefore grown in line with prices rather than earnings since the beginning of the 1980s. The UEL has fallen from 140 per cent of average earnings to 120 per cent and will continue to fall. With price indexation, and 2 per cent real earnings growth per annum, the UEL will be less than 60 per cent of average male earnings by 2030, implying a maximum SERPS pension of only 10 per cent of average male earnings.[5] On the other hand, the same rate of indexation of the LEL will increase the SERPS entitlement of those with earnings below the UEL, since they will accrue SERPS on a larger part of their earnings.

PERSONAL PENSIONS

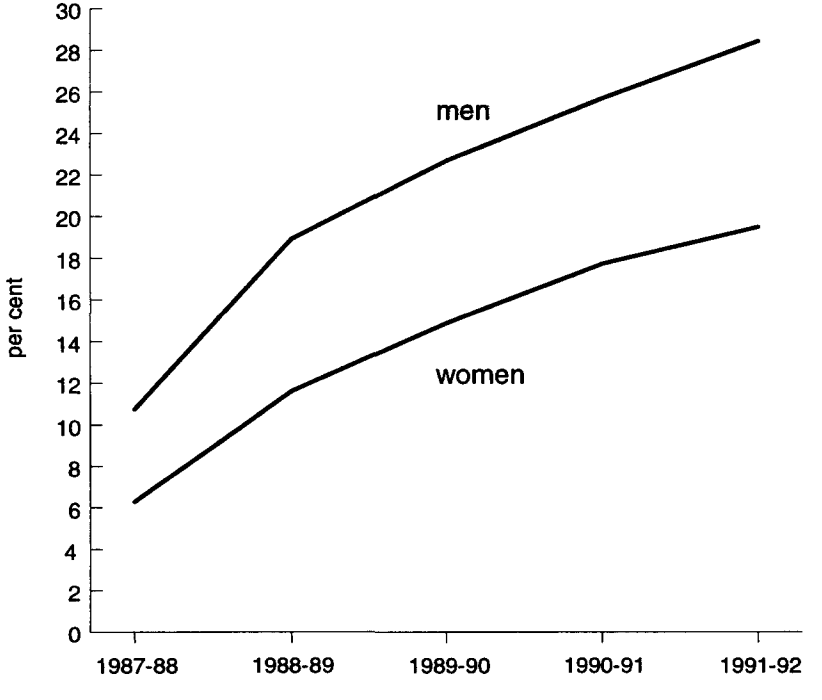
Since 1988, the contracting-out option has been extended to a further range of pensions: personal pensions — individual retirement accounts — and employer-provided defined contribution schemes. Again, forgoing SERPS benefits equal to

4. See Creedy and Disney (1988) for a detailed discussion of the changes.
5. See Disney and Whitehouse (1991b) for further discussion.

the guaranteed minimum pension level results in a rebate of National Insurance contributions. The condition for leaving SERPS is not, however, that a guaranteed minimum pension should be paid, but that a guaranteed minimum *contribution* should be made. This minimum level is the contracted-out rebate. The rebate for people newly contracting out into personal pensions (or group defined contribution schemes) was set above the rebate for those in occupational pensions. Initially, an extra 2 per cent 'incentive' rebate was offered with the aim of 'kick-starting' the personal pensions sector. In 1993–94, this

FIGURE 2.3

Personal Pension Coverage, 1987–92



Note: Percentage of employees who are members of contracted-out personal pensions.
Source: Department of Social Security (1993c).

declined to an incentive rebate of 1 per cent restricted to the over-30s. The rationale for this policy is that a large number have already taken out personal pensions, and so a kick-start is no longer necessary, but the 1 per cent additional rebate is a step in the direction of a closer relationship between the rebate and age.

Personal pensions proved popular. Figure 2.3 shows the penetration of personal pensions; by 1992, 28 per cent of male and 19 per cent of female employees had contracted out into personal pensions.

OCCUPATIONAL PENSIONS

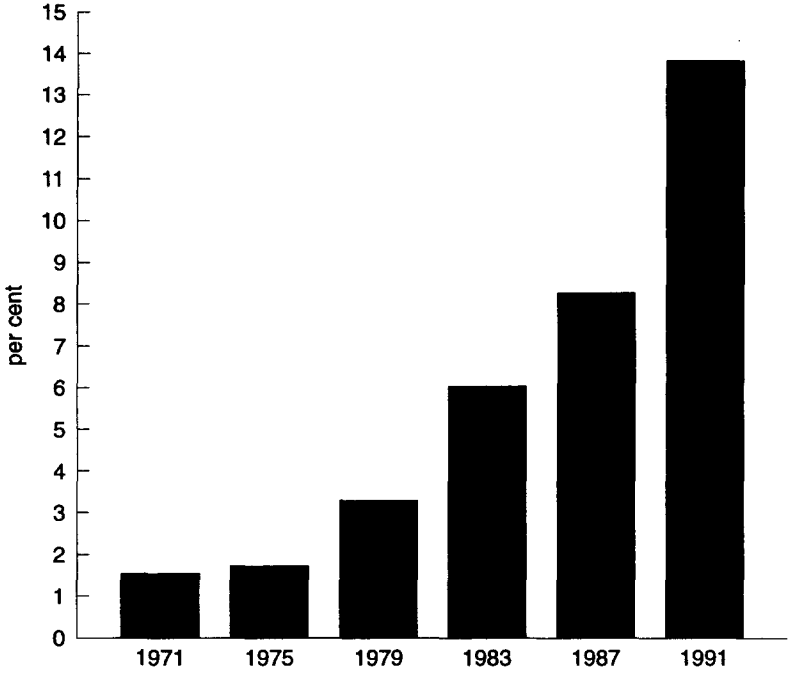
As well as offering employees new options for supplementary pension provision, Social Security Act 1986 offered *employers* a new opportunity: operating a contracted-out defined *contribution* scheme. Figure 2.4 shows the proportion of employees in private sector pension schemes that have a defined contribution formula. Since 1988, the number in contracted-in defined contribution schemes has remained at about 500,000, but 430,000 are now in the new contracted-out schemes. Figure 2.4 also shows that there had already been a shift to defined contribution formulas since the mid-1970s. Allowing such schemes to contract out has accelerated this change.

There is little evidence to suggest that the shift to defined contribution schemes among employers reflects companies changing from defined benefit schemes. The Government Actuary found around 50,000 members had seen their scheme change to a defined contribution scheme between 1987 and 1991, accounting for just 10 per cent of the total increase in numbers.[6] Similarly, the most recent National Association of Pension Funds (1994) survey found just 1 per cent of members had shifted to a defined contribution formula in the last year. The switch to benefit formula arises from newer firms setting up defined contribution schemes, as in the US, rather than from changes to existing schemes. However, many firms with defined benefit schemes have

6. Pension Law Review Committee (1993).

FIGURE 2.4

The Growing Role of Defined Contribution Schemes



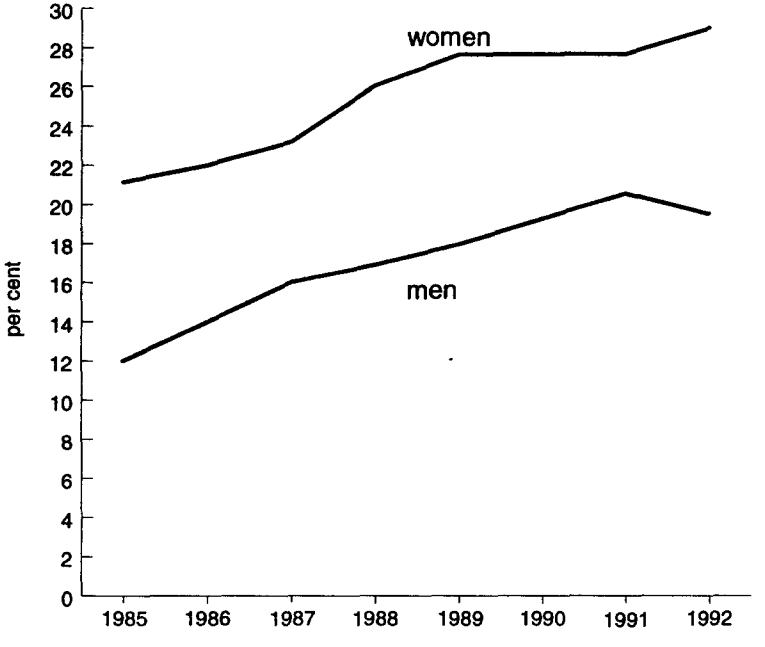
Note: Percentage of private sector members of occupational pension schemes with defined contribution benefit formulas.
Sources: Government Actuary (1978, 1981, 1986, 1991) and Pension Law Review Committee (1993).

said that they would consider switching to a defined contribution formula.

The third change arising from Social Security Act 1986 was that for the first time individuals had a choice over whether to participate in employer-provided pensions. Before 1988, most firms offering an occupational pension scheme made membership compulsory for eligible employees. Just 8.5 per cent of scheme members were in voluntary plans. (They accounted for around 17

FIGURE 2.5

Proportion of Employees Not Joining Occupational Pension Schemes



Note: Percentage of full-time employees whose employers operate an occupational pension scheme who are not covered. Includes those ineligible (usually because part-time, too young or too old, or because tenure too short) and those who choose not to join.
Source: General Household Survey, various years.

per cent of private sector members, with none in the public sector.)[7]

Figure 2.5 shows the effects that making scheme membership voluntary had on the proportion of full-time employees who were not members of the pension scheme offered by their employer. Since 1987, the total percentage not joining has increased from

7. Government Actuary (1981, 1986).

18 to 23 per cent, with a slightly more rapid increase among full-time women.[8]

Some evidence of the *flow* of people becoming eligible for pensions who choose not to join is given by the National Association of Pension Funds (1994) annual survey. Take-up among new employees was about 80 per cent, and has remained at around that level since 1990.[9] It is difficult to find evidence of the pension choice among people who do not join their employer's scheme — whether they defaulted to SERPS or took out a personal pension instead, and in that case, whether they invested more than the contracted-out rebate minimum. A paternalist would argue that all these alternatives, which would mostly reduce the individual's pension entitlement, are adverse choices. But it is possible that individuals are behaving rationally, considering themselves 'over-annuitised', with the level of savings implicit in the occupational pension exceeding the desired amount.

WHO HAS WHAT

Social Security Act 1986 introduced new pensions options for individuals and employers, and gave all employees earning over the lower earnings limit two or three choices of supplementary pension provision. Two groups of employees are not covered by any supplementary pensions (or, indeed, the basic pension part of state provision). Those earning below the National Insurance LEL neither pay contributions nor build up benefit entitlement. In 1991, they amounted to some 12 per cent of the work-force. With

8. Not all of these individuals *choose* not to join schemes: some may be ineligible. The General Household Survey has not asked respondents their reasons for not joining schemes since compulsory membership was stopped, but in 1987, those who were ineligible represented around a fifth of the total not joining. Those choosing not to join were equivalent to a little less than 4 per cent of occupational pension scheme membership. It is interesting to note that since just 8.5 per cent of members are in voluntary schemes, then non-joining rates were around one-third of eligible employees in these voluntary schemes.
9. This should be distinguished from the evidence above, which looks at the *stock* at any given time of members as a proportion of numbers eligible.

the LEL indexed to prices and with real earnings growth, we can expect this proportion to fall in the future. However, there is a significant threshold tax rate (particularly taking employer contributions into account) at the LEL. It may be that the response of employers and employees to the fall in the LEL relative to wages is to reduce hours, to keep earnings below the threshold. The second group not covered by any supplementary pensions is women paying the married women's reduced rate of National Insurance contributions.

Table 2.3 summarises current pension coverage. Eighty-five per cent of employees have some supplementary pension provision, with 15 per cent excluded (mainly women) since they earn below the LEL or pay the married women's reduced rate. The

TABLE 2.3

Pension Coverage, 1991

	Percentage of employees
Contracted-out defined benefit occupational pension	42
SERPS + defined benefit occupational pension	3
Contracted-out defined contribution occupational pension	2
SERPS + defined contribution occupational pension	2
Personal pension	24
SERPS only	12
Below LEL	12
Married women's rate	3
Total occupational pension	49
Total contracted out	68
Total contracted in	17
Total defined benefit	44
Total defined contribution	28

Sources: Department of Social Security (1993c), Pension Law Review Committee (1993) and authors' calculations using 1991 Family Expenditure Survey.

dominant form of provision remains employer-provided pensions, with 49 per cent of employees belonging to some kind of occupational pension scheme. Contracted-out defined benefit occupational schemes cover 42 per cent of employees. The proportion contracted into SERPS has now fallen back to 17 per cent of all employees.

To show the relative importance of different types of second-tier pension provision, Table 2.4 gives the breakdown of coverage for employees earning over the LEL. To focus on second-tier coverage, contracted-in private pensions are excluded from the analysis. Overall, the split is roughly between two-thirds with defined benefit coverage (either occupational schemes or SERPS) and one-third defined contribution (occupational schemes again and personal pensions). Some 80 per cent of second-tier pensions are provided by the private sector, with more than half by employers and more than a quarter directly by financial institutions. This understates the role of the financial institutions, which administer a number of occupational schemes and are often involved in managing pension funds. Around 11 per cent of individuals are in 'insured' occupational pension schemes,[10] where pension benefits are secured solely by annuity contracts and

TABLE 2.4

Supplementary Pension Coverage, 1991

	Percentage of employees with second-tier coverage
Defined benefit occupational pension	49
Defined contribution occupational pension	2
SERPS	20
Personal pension	28

Note: Excludes those without second-tier coverage (below LEL or paying married women's reduced rate).
Sources: As Table 2.3.

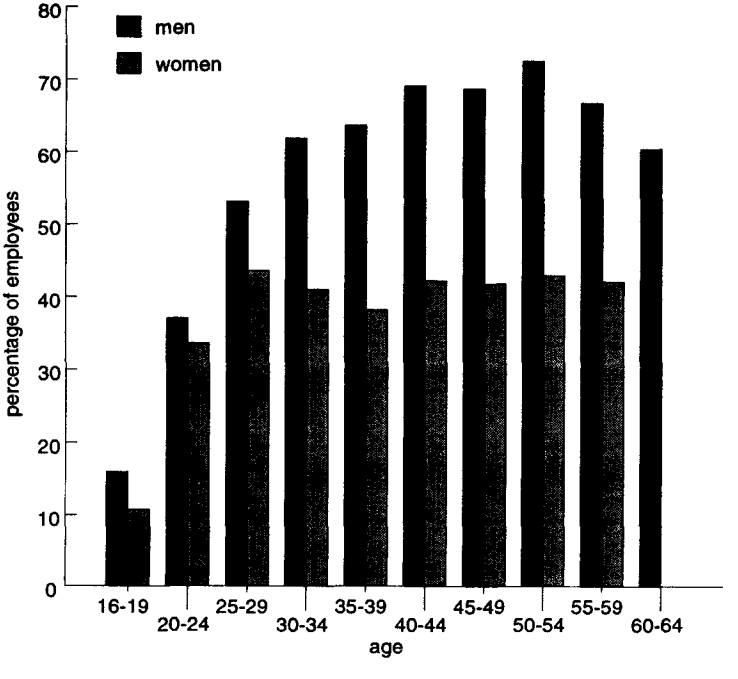
10. Mainly small, wholly private sector plans.

managed by an insurance company.[11] Furthermore, the National Association of Pension Funds (1994) shows that the funds for a further 3 per cent of pension plan members are invested through some pooled arrangement. Some in-house investment management is used for 40 per cent of members; the rest rely on some external investment management.

The structure of pension provision has changed substantially since 1988, with not only a large shift to defined contribution provision, but a significant 'privatisation' of pension provision as individuals moved out of SERPS.

FIGURE 2.6

Occupational Pension Coverage, by Sex and Age



Source: Pension Law Review Committee (1993).

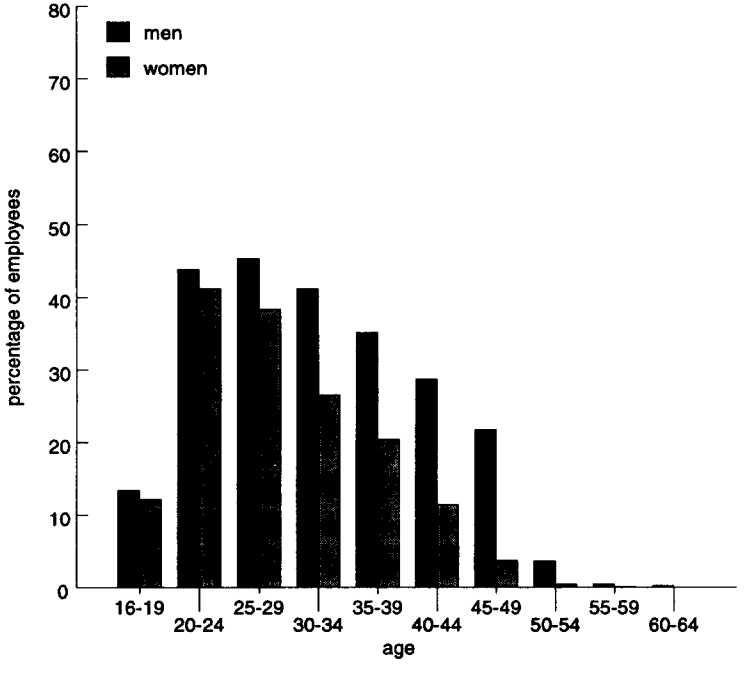
11. Pension Law Review Committee (1993).

The aggregate figures above give a flavour of the relative importance of different types of pension provision. Figures 2.6 and 2.7 disaggregate the totals, to look at pension coverage by sex and age. Occupational pension coverage increases rapidly with age, until the 25–29 band for women and the 30–34 band for men; thereafter, the proportion covered by age-group averages around 45 per cent of women and 65 per cent of men.

Personal pensions show a completely different pattern. Only a tiny proportion over the age of 59 have a personal pension, and coverage peaks among individuals in their 20s, declining monotonically thereafter. Overall, younger workers are much more likely to be in personal than occupational pension schemes, and women are less likely than men to have either form of private provision.

FIGURE 2.7

Personal Pension Coverage, by Sex and Age



Source: Department of Social Security (1993c).

This pattern is not surprising if individuals make a rational economic calculus of the costs and benefits of each type of scheme. Personal pensions are much more attractive than other options for younger workers; SERPS is less generous to them, and contributions to a personal pension are more valuable because there is a longer time to retirement for investment returns to compound. Occupational pensions are relatively more attractive to older workers, since they are more generous to less mobile workers and people who are closer to retirement. We spell out the reasons for this in more detail below.

CONCLUSIONS

The reforms in Social Security Act 1986 dramatically changed the structure of supplementary pension provision, as originally introduced in 1978. New pensions options were introduced and, for the first time, all individuals were offered a choice. This has had a dramatic effect on the types of second-tier pension schemes in which individuals participate. The role of the private sector has increased, with far fewer SERPS members. There has been a shift to defined contribution provision, away from defined benefit formulas. Personal pensions have substituted for SERPS (and, to a lesser extent, occupational pensions) and there has been a near doubling of the numbers covered by employer-provided defined contribution schemes. How far these trends will continue is discussed in Chapter 4.

2.4 Demographic Background

The proportion of the population over pensionable age will increase in the UK and in all other OECD countries over the next 40 years. This ageing of the population has been described by many as a 'demographic time bomb', because of its profound effects on the labour market, economic performance and, especially, the costs involved in supporting an increased pensioner population. Worries about the future demographic situation were partly behind the Government's decision to announce the future equalisation of state pension ages at 65, implying a five-year

increase in women's pension age (Department of Social Security (1993b)). Table 2.5 shows how the numbers of working age (16 to state pension age) and over state pension age have changed over the past 30 years and how they are expected to change over the years up to the middle of the next century. These figures take account of the increase in state pension age for women and recent revision by the Government Actuary of population forecasts based on the 1991 census.

A population is said to age when the proportion of the elderly increases. The age structure of the population is determined by three factors: fertility, mortality and net migration. Whatever the original age structure, any two populations with the three flows at the same rate will eventually end up with the same age structure.[12] In general, fertility is more volatile and therefore a more powerful agent in changing age structure than mortality.

Turning to Table 2.5, we show the most commonly used measure of the burden of ageing — the support ratio — on the third line. This is simply the ratio of the number of people of working age to the number of pensioners. An alternative measure is the dependency ratio — the inverse of the support ratio — which

TABLE 2.5

A Century of Population Estimates and Projections

Million

	1960	*1970*	*1980*	*1991*	*2000*	*2010*	*2020*	*2030*	*2040*	*2050*	*2060*
Working age	31.0	31.9	32.5	34.4	35.2	36.0	37.5	35.8	34.4	33.8	32.5
Pension age	7.6	8.7	9.4	10.4	10.5	11.7	11.5	13.5	14.3	13.5	13.2
Support ratio	4.1	3.7	3.5	3.3	3.4	3.1	3.3	2.7	2.4	2.5	2.5

Note: Support ratio is number of working age over number over pensionable age (65 for men and 60 for women until 2010, 65 for both from 2020).
Source: Government Actuary's projections.

12. Coale (1972).

measures the number of dependants relative to the number of workers.

Looking backwards, the last 30 years have seen a significant ageing of the population, as measured by a declining support ratio. Although the potential work-force has expanded by more than 3 million, the number of pension age increased by more than 2.5 million from a much lower base. The number of workers per pensioner fell by 25 per cent. So Britain has already been through a period with a substantial ageing of the population.

In contrast, the projected situation is relatively stable over the next 20 years, with a modest fall in the support ratio. But from 2020 onwards, the population begins to age rapidly again as the 'baby-boom' generation reaches pension age. Over the subsequent two decades, the support ratio falls by more than a quarter.

Ageing of the population results both from reduced mortality and from reduced fertility. The overall picture of dependency is somewhat different if we take account of lower fertility rates, resulting in fewer children.[13] In fact, there was a *fall* in this measure of total dependency between 1970 and 1990, as the number of children fell from 14 million to 11 million. In the future, however, the number of children is expected to remain broadly constant.

Also important from an economic point of view are the proportion of the working age population that is economically active and the proportion that is in work. Over recent years, there have been big changes in these numbers. The best-known of these is the level of unemployment, which has risen dramatically since the late 1960s. Even more important, however, has been an increase in the labour market participation of women, which has more than offset the rise in unemployment. Increases in levels of early retirement and lengths of time spent in full-time education are also important. Over the period since 1970, for example, the population of working age has increased by 2.5 million. Over the same period, the work-force (i.e. the work-force in employment plus the claimant unemployed) has risen by 2.1 million while the

13. Sauvy (1969) and Falkingham (1988).

work-force in employment has barely changed — dropping by about 100,000 between 1970 and 1993. The sex composition of the work-force has changed dramatically: the number of males in the work-force has dropped by nearly 700,000 while the number of females has risen by over 2.8 million.

So, while the table shows an increase of 2.5 million in the working age population between 1970 and 1991, there has in fact been no increase in the number of people actually working and thus supporting the larger elderly population. In the future, it is clear that trends in labour force participation and employment will have an important effect, in addition to that of the pure demographic changes, on the ability of the economy to support an increased elderly population. It is, though, much harder to predict accurately changes in the size of the work-force and in employment levels than it is to predict population sizes. The Department of Employment (1991) predictions of largely unchanged participation rates into the future would imply changes similar to those shown from pure demographic effects.

As noted, Table 2.5 takes account of the proposed equalisation of state pension ages at 65, to be phased in between 2010 and 2020. The Government estimates that this will reduce the number of people of pensionable age by 1.4 million when fully introduced, with a corresponding increase in the number of working age. Without this change, the support ratio would have fallen to 2.8 rather than 3.3 which is now predicted.[14]

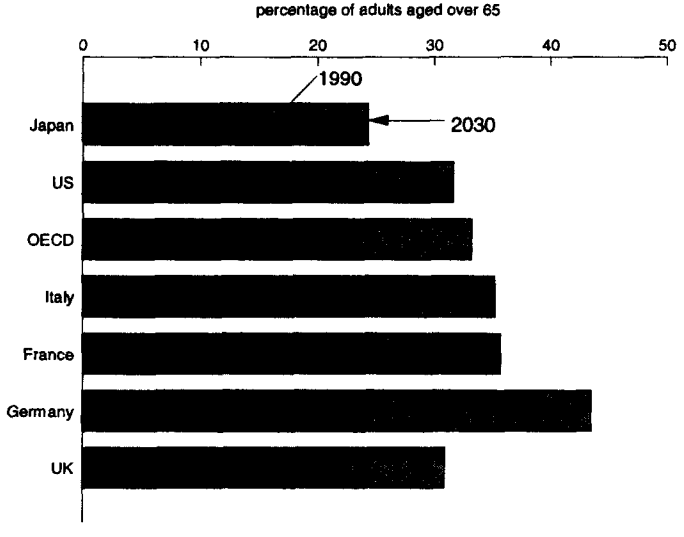
INTERNATIONAL COMPARISONS

In 1990, the UK had a higher proportion of its adult population over the age of 65 than any of the other major economies. The UK, as we have seen, has already experienced a considerable ageing of its population. Over the next 40 years, however, other countries will also experience population ageing, seeing very substantial increases in the proportion of elderly people in their populations. By 2030, only Japan will have a more favourable demographic

14. Department of Social Security (1993b).

FIGURE 2.8

International Comparisons of Ageing Populations



Note: Percentage of population over 16 who are over 65. Germany is western Germany only.
Source: OECD (1988).

composition than the UK, which will have a smaller proportion of its population over the age of 65 than the OECD average. Figure 2.8 compares the situation in the UK with that in other major OECD countries.

Population ageing is a phenomenon being faced by all the major industrialised countries; it is not something peculiar to this country. Indeed, to the extent that it causes problems for economic and social policy, those problems are likely to be less acute in this country than elsewhere.

2.5 Pensioner Incomes in Britain

One of the main reasons for public and political interest in the issue of pensions is the relatively low living standards historically

enjoyed by most pensioners, and the dependence of many on the state for the greater part of the income that they do have. In this section, we both describe pensioner incomes in aggregate and look at how they are distributed among pensioners. We also show how levels and distributions of income among pensioners have changed.

The level of pensioner incomes, their distribution and composition are all vital determinants of the future policy mix towards pensioners and reflections of the effects of previous policies. High and rising levels of private incomes would, for example, both tell us about the success of past (or current) private provision and inform the debate about the appropriate role for the state in providing pensions. Whatever the theoretical merits of any particular policy, a rich pensioner population will clearly require a different policy mix from that required by a poor one, and an unequal pensioner population will require different policies from those required by an equal one.

In 1990–91, the mean net weekly income of all pensioner units[15] was £138 (in January 1994 prices). The median, however, was just £86 — half of all pensioners had weekly incomes of less than £86. Naturally, pensioner couples had more income than single pensioners — a mean of £197 as against one of £103. For all pensioners, benefits from the state — mainly the state pension, but also benefits such as income support, housing benefit and various sickness benefits — made up almost exactly half of total (gross) income. Single pensioners, however, were rather more dependent on the state, which provided over 56 per cent of their income, than were pensioner couples, only 44 per cent of whose income was made up of social security benefits.

The other main components of income were occupational pensions and investment income, each accounting for around a fifth of total gross income. These, however, are very unevenly distributed. Only around 60 per cent of pensioner units had any income from occupational pensions. And while three-quarters had

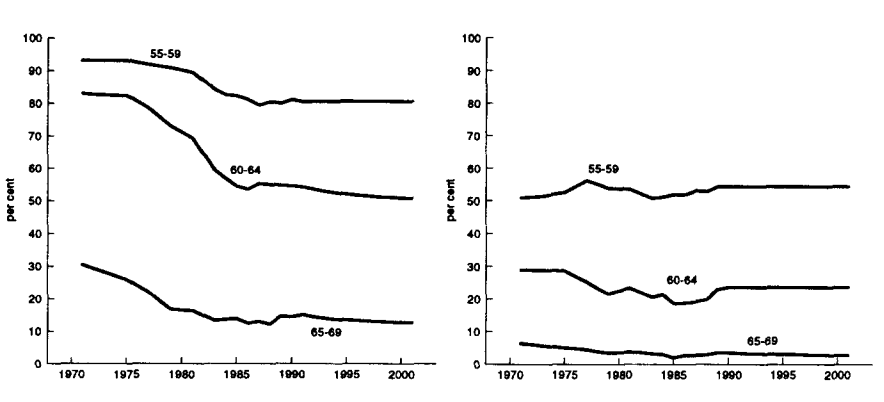
15. Single women aged 60 or over, single men aged 65 or over, and couples where the husband is 65 or over.

some income from investments, the majority had only rather small amounts. Furthermore, the high levels of investment income in 1990–91 at least partly reflect the high levels of interest rates in that period. As interest rates have at least halved since then, we can expect that investment incomes will have fallen dramatically.[16]

The final income source of any importance was earnings, which made up around 7 per cent of gross income. Of all the types of income received by pensioners, earnings is the only one to have fallen in real terms since 1979, reflecting the much lower likelihood of those over pension age being in employment by 1990–91.

FIGURE 2.9

Participation Rate Estimates and Projections, 1971–2001



Note: Percentage of population employed or seeking work by sex and age-group.
Source: Department of Employment (1991).

16. But because we are measuring nominal investment returns, and inflation has fallen over the period, this does not necessarily mean that pensioners are worse off as a result. With high nominal interest rates resulting from high inflation, a large part of the interest income is simply compensating for falling real asset values.

Looking further back, the fall in the proportion of pensioner incomes coming from earnings has been very marked over the past 20 years. This largely reflects a significant reduction in work participation among older groups over the period, a reduction which we examine in more detail here because of its important effect on incomes. Figure 2.9 gives the Department of Employment's estimates of economic activity rates for older men and women by age-group. The trend to earlier retirement is most dramatically illustrated among men aged 60–64, with the labour force participation rate (the proportion of the population working or seeking work) falling from over 80 per cent to a little over 50 per cent between the mid-1970s and mid-1980s. There was also a decline in participation of over 10 percentage points for men aged 55–59, and the proportion of men immediately above state pensionable age (65–69) who were participating in the labour market halved from 30 to 15 per cent.

The picture for women is different. Higher life-cycle levels of participation between date-of-birth cohorts have masked any trend to earlier retirement. The participation rate for women aged 55–59 has remained broadly constant, with some cyclical variation, while there has been a fall for women immediately over state pensionable age (60–64) and a modest fall for women aged 65–69, though from a very small base.

Against the background of future ageing in the population discussed earlier, the shift to earlier retirement might be of concern. Economic dependency — the relationship between the number of people working and not working in the economy — will worsen even further than suggested by the raw demographic changes if people continue to retire earlier.

In fact, so far, the effect of ageing on the economic dependency ratio has been largely offset by the increase in the proportion of younger women participating in the labour market. Between 1970 and 1990, the numbers of pensionable age relative to the numbers of working age rose by a quarter, but the ratio of labour market participants to adult dependants was barely changed: the labour force participation rate of women rose to offset the effects both of increasing numbers over pension age and of earlier retirement among men. Although changes in labour force participation can offset demographic trends for long periods,[17] there is obviously a

limit to the extent to which increased numbers of younger women working can continue to compensate for the ageing of the population and the shift to earlier retirement.

Earnings are the only form of income for pensioners which did not rise between 1979 and 1990–91. Mean income rose by 42 per cent and the median by 26 per cent. The divergence between the increase in the mean and that in the median itself conveys something of the widening in the pensioner income distribution over the period, which is discussed in greater detail below. Incomes from benefits, occupational pensions and investments all rose in real terms over the period, by 17 per cent, 98 per cent and 171 per cent respectively.[18] Clearly, private sources of income have become much more important over the period and the share of state benefits in pensioners' incomes has fallen from just over 60 per cent to just under 50 per cent. The rise in benefit income, despite the freezing in real terms of the basic state pension, reflects both increased real levels of income support and, importantly, receipts of SERPS, which had of course only just been introduced in 1979.

The real level and composition of pensioners' incomes in 1979 and 1990–91 are shown in Table 2.6 (in January 1994 prices). The table also shows figures for net incomes after housing costs. These are of interest for two reasons. First, they tell us something more about the living standards of pensioners once they have met housing costs (rents and any mortgage interest mainly). A pensioner who is having to pay rent is clearly worse off than one who is living free in a home that they own. Second, they strip out the effects of housing benefits. An increase in rents can lead the basic before-housing-costs income measure to rise because housing benefit would rise to reflect the rent increases. This would give a misleading impression of rising living standards.[19] In fact, the 54 per cent real increase in average after-housing-costs income is higher than that for the before-housing-costs measure.

17. Creedy and Disney (1992).
18. Again, note that the increase in the level of investment income will have been inflated by the exceptionally high interest rates prevailing in 1990–91.
19. A detailed discussion of this matter is given in Johnson and Webb (1992).

TABLE 2.6

Levels and Composition of Pensioner Incomes

January 1994 prices

	1979 (£ per week)	*1990–91 (£ per week)*	*Percentage change (%)*
Gross income	112	162	44
of which:			
Benefit income	69	81	17
Occupational pension	18	36	98
Investment income	12	33	171
Earnings	13	12	–8
Other	1	1	0
Net income (before housing)			
Mean	97	138	42
Median	69	86	26
Net income (after housing)			
Mean	81	125	54
Median	53	68	29

Note: Divergences are caused by rounding.
Source: Authors' calculations based on Department of Social Security (1993c, Table B2.01).

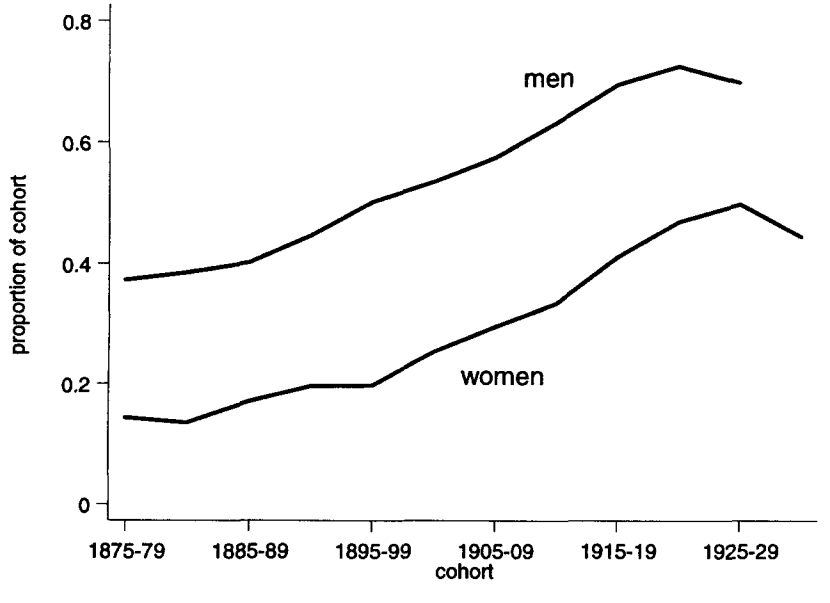
This probably reflects lower housing costs on average because of increased levels of owner-occupation.

Something further about the development of pensioner incomes can be gleaned by comparing the incomes of the recently retired with those of the pensioner population as a whole. Female pensioners up to the age of 64 and male pensioners up to the age of 69 have higher incomes from every source than do pensioners as a whole. This is a consistent pattern over a lengthy period; each new cohort of pensioners is better off than previous cohorts. This reflects higher incomes over the working life and increased availability of private pensions.

Among this younger group, average levels of occupational pension receipt in 1990–91 were nearly £48 per week (in 1994 prices), a third higher than levels prevailing among the whole pensioner population. Mean incomes overall were a quarter higher for this younger group. What is also interesting, looking at the development of the incomes of the youngest group of pensioners over time, is the way they have become more unequal. In 1979, the mean was just 9 per cent above the median. By 1990–91, the gap had increased to 16 per cent. This is still far less than the 60 per cent gap between the mean and median income of the whole pensioner population, but it does indicate that the growing inequality among pensioners is not just a measure of the increasing incomes of younger pensioners opening out a gap between themselves and earlier cohorts, but also results from increasing inequality among those becoming pensioners.

FIGURE 2.10

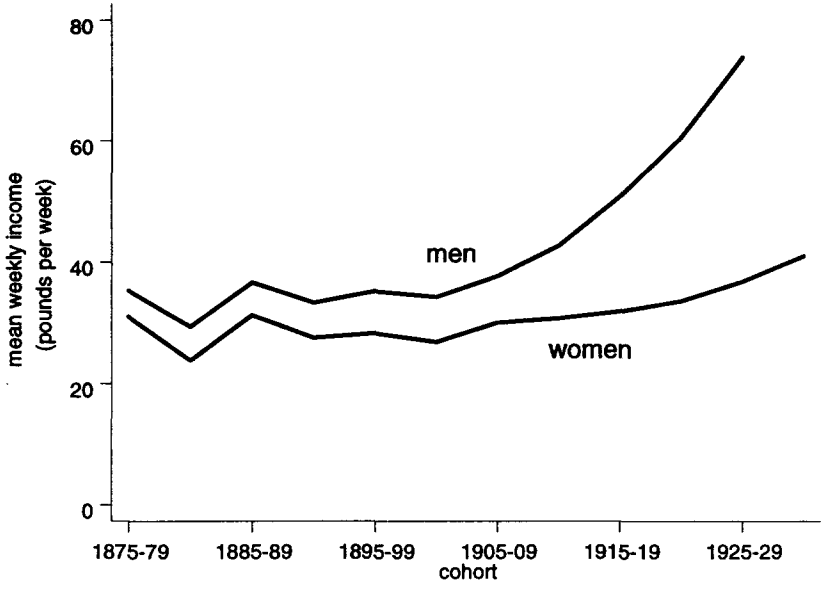
Proportion of Pensioners with Private Pension Income, by Sex and Date-of-Birth Cohort



Source: Authors' calculations using FES data, 1961–91.

FIGURE 2.11

Mean Real Private Pension Income, by Sex and Date-of-Birth Cohort



Note: All amounts in constant 1991 prices. Means are for those with some recorded private pension income.
Source: Authors' calculations using FES data, 1961–91.

The importance of the cohort effect on occupational pension receipt is confirmed by our own analysis of data from the Family Expenditure Survey (FES). Looking at data from the last 30 years, we can see both the proportions of pensioners born in years from 1875 through to 1929 who were in receipt of an occupational pension, and the average level of that pension. Figure 2.10 shows that, of men born between 1875 and 1879, and therefore retiring between 1940 and 1944, fewer than 40 per cent had any income from an occupational pension.[20] Of those born 40 or so years later,

20. And note that this is probably an overestimate of the numbers in this cohort who had a private pension. Because our data only start in 1961, we only

around 70 per cent had a private pension in retirement. Among women, the growth was from under 20 per cent to more than 40 per cent.

Members of later cohorts who had an occupational pension were also likely to receive higher levels of pension, as illustrated in Figure 2.11 which shows average (positive) level of receipt by cohort. The real mean level of receipt for the 1925–29 cohort was almost double that for the 1905–09 cohort. This reflects a combination of longer periods of coverage, higher earnings and improved indexation procedures within the occupational pension sector. Later cohorts of women have seen a much less precipitous rise in real levels of pension income. This probably reflects the greater extent to which women suffer from the lack of portability of occupational pensions, the shorter periods spent in schemes by women and the rapid growth in the number of women covered.

We can expect the growth in levels of occupational pensions to continue for some years yet, as increased periods of coverage, higher earnings and improved indexation provisions continue to feed through. However, it is likely that, particularly among men, the proportion of retirees covered by occupational schemes will not grow further. Indeed, this is reflected in the tailing-off of the lines in Figure 2.10.

Thus far, we have concentrated on average levels and compositions of income, but it is of course vital to know how that income is distributed. The divergence between the mean and median income has already given some idea of the spread of incomes. Table 2.7 gives much more information, by showing the median income of each quintile of the income distribution and the amount by which it has changed since 1979. Figures for income both before and after housing costs are shown.

Two things are immediately clear from Table 2.7. The first is that pensioners' incomes are not evenly distributed. The median income in the top quintile (i.e. 90 per cent of the population has

observe the very longest-lived members of this cohort. There is a strong positive correlation between income, occupational pension receipt and longevity — those with occupational pensions tend to live longer than those without.

TABLE 2.7
The Pensioner Income Distribution

1994 prices

Quintile	Before housing costs		After housing costs	
	Median income (£ per week)	*Growth since 1979 (%)*	*Median income (£ per week)*	*Growth since 1979 (%)*
1	60	11	47	10
2	75	19	55	15
3	86	25	68	30
4	129	51	112	68
5	246	50	231	65

Source: Department of Social Security (1993c, Table B2.03).

less than this income) is more than four times the median income in the bottom quintile (which is less than the income of 90 per cent of the population). The second is that the pensioner income distribution grew much more unequal over the 1980s. The richest pensioners in 1990–91 were 50 per cent better off than the richest pensioners in 1979 (65 per cent better off on the after-housing-costs measure), whereas the poorest pensioners were only around 10 per cent better off. In many ways, these changes reflect the widening over the 1980s of the distribution of incomes for the whole population, though the change is somewhat less stark — among the population as a whole, the very poorest groups saw no increase in income over the period.[21]

Pensioners are not a homogeneous group as far as their incomes are concerned, and the difference between rich and poor pensioners is becoming more and more marked. Policies that were appropriate when pensioners were much more alike — mostly poor — might no longer be appropriate. In all our discussions of pensions and pensioners, it is vital to bear this in mind; there are

21. See, for example, Department of Social Security (1993c) and Giles and Webb (1993a, 1993b).

large differences between people over pension age, just as there are differences within the population of working age. The growing inequalities among the working age population are likely to feed through into yet further inequality among the pensioner population. As this process continues, public policy will have to respond.

It is interesting not only to know what the distribution of incomes among pensioners looks like, but also where pensioners fall in the overall distribution of incomes. We know from DSS Households Below Average Income statistics that pensioners are now far less likely to be in the poorest 10 per cent of the population than was the case in 1979. In 1979, pensioners made up 31 per cent of the poorest decile (after housing costs); by 1990–91, they accounted for only 11 per cent of this decile. The proportion of the bottom quintile made up of pensioners fell from 38 per cent to 24 per cent over the same period. This trend has been fairly continuous from the mid-1970s onwards, particularly as unemployment rose and pensioners were replaced by the unemployed right at the bottom of the income distribution.

In 1979, 46 per cent of all pensioners were in the bottom 20 per cent of the overall income distribution. In other words, there were more than twice as many pensioners at the bottom of the income distribution as there would have been if pensioners had been as well off as the rest of the population. By 1990–91, this over-representation of pensioners at the bottom had fallen enormously, so that just 29 per cent of pensioners were to be found among the

TABLE 2.8

Proportion of Pensioners in each Quintile of the Overall Population Income Distribution (after-housing-costs income measure)

Per cent

	Quintiles of the income distribution				
	Lowest 20%	*Second 20%*	*Third 20%*	*Fourth 20%*	*Highest 20%*
1979	46	22	13	9	10
1990–91	29	30	17	12	12

Source: Department of Social Security (1993c).

poorest 20 per cent of the population. Table 2.8 shows the proportion of pensioners in each population income quintile in 1979 and in 1990–91. There has been a very clear shift of pensioners away from the very bottom of the income distribution towards the middle. There has been only a small growth in the proportion of pensioners finding themselves at the top of the income distribution. Given the rate at which the incomes of the population top quintile have risen, this is not surprising.

CONCLUSIONS

In many ways, pensioners have been doing well over the past decade or so. On average, their incomes have risen by 40 or 50 per cent (depending on the measure), there have been increases at all points in the pensioner income distribution and pensioners are no longer concentrated right at the bottom of the population income distribution. Furthermore, there have been large increases in the amounts of private pension income being received and it is likely that this trend will continue. The further maturation of SERPS will also lead to some continued increase in pensioner incomes.

On the other hand, there has been a great widening of the pensioner income distribution and there is no reason to expect that to end, especially as the effects of recession and high unemployment feed through to low incomes in retirement. Incomes have been rising but they are still not high. After housing costs, the median weekly income of single pensioners in 1990–91 was less than £60 (in current prices) — half of all single pensioners have less than £60 per week to live on after they have paid any rent (or mortgage interest). So the general increase in living standards should not blind us to the fact that this increase has been far from uniform and from a low base. Both these facts are of central importance to the formulation of pension policy.

CHAPTER 3

Economics of Pension Provision

3.1 Pensions and their Role

The straightforward rationale for a system of pension provision — whether provided privately or through a social security programme, or both — is to provide income during retirement.

Pensions do indeed provide income in retirement, but as we showed in Chapter 2, so do earnings and investments. Although pensions — public and private — form the greater part of income in retirement, what the income level of individuals would have been in the absence of pensions is hard to know. Clearly, an individual would have a different income and wealth accumulation strategy over the lifetime in the absence of pension provision — savings in other forms would be higher.

PENSIONS AS INSURANCE

The distinguishing feature of pensions is that they provide income in the form of an annuity. They offer a guaranteed nominal (or real) income stream from a certain age until death, or the death of surviving dependants. Generally, though not always, the level of this income stream depends on contributions made to the pension scheme, whether publicly or privately provided, during the working life.

Where contributions are made, pension provision can readily be seen as a form of savings. These contributions might be directly invested to provide a sum of money on retirement with which an annuity can be bought, as with personal pensions. Here it is clear that pensions provide a particular savings vehicle. Effectively, accumulated contributions buy an annuity at retirement.

Accumulating contributions is simply saving to allow the deferral of consumption. Alternatively, contributions might simply confer entitlement to a pension, without themselves directly buying it, as with the basic state pension.

In either case, the existence of the pension will affect other saving and the labour supply behaviour of individuals. In the absence of private or publicly provided annuities, uncertainty over length of life would lead risk-averse individuals to save more than would be necessary in aggregate. If individuals do not know when they will die, and cannot buy an annuity, many will die without consuming all their assets, since they cannot risk consuming them and facing old age with nothing. By buying an annuity or receiving an income stream from a state pension scheme, 'longevity risk' is borne by the insurer or the state rather than by the individual.

If contributions to pension schemes can readily be seen as savings, it is in this sense, of protecting against longevity risk, that pensions in payment can be seen as a form of insurance. For example, if someone insures their car against the risk of theft, they, *ex post*, benefit from paying their insurance premiums if the car is stolen but not if it is not. The 'risk' with pension insurance is that one will live a long time; just as one will benefit from insurance if one's car is stolen, so one will benefit from pension insurance if one lives a long time.

Note, however, that longevity risk does not provide a rationale for *public* social security provision as such. Where private insurers can monitor longevity risks adequately, a market in pension insurance should be able to work in just the same way as many other private insurance markets. If risks cannot be monitored adequately, so generating a problem of 'adverse selection',[1] compulsory private insurance, rather than publicly-provided social security, could be sufficient. Given that all western countries do have state-provided pensions to a greater or lesser degree, this naturally leads us on to the question of why the state should provide pensions and what its role should be.

1. See Section 3.4 below.

The remainder of this section concentrates on the two most commonly cited reasons for public provision — poverty alleviation and paternalism. It also describes the way in which these issues have been tackled.

POVERTY ALLEVIATION AND SOCIAL INSURANCE

A straightforward argument for public provision is that some individuals have insufficient lifetime income to save enough to provide themselves with an adequate income in retirement. At the least, a minimum income, perhaps means-tested (see Chapter 6), should then be provided for the alleviation of poverty. Systematic redistribution from rich to poor and guarantees of 'adequate' levels of pension are functions which can be undertaken only by, or under the direction of, the state. Even here, the state need not actually do the collecting of contributions and paying of benefits. It could legislate to ensure that private companies did the same.[2] But in any case, the state would be at the centre, regulating any such scheme involving systematic redistribution and guaranteeing benefits.

The state could ensure adequate incomes for all in retirement without any contributory structure or nod in the direction of social insurance. Suppose a universal benefit was paid to all those over pension age without any regard to their working or contribution history. We would still have no problem in calling such a system a pension system — a guaranteed income from pension age until death would remain. There would be no explicit contribution mechanism — individuals would not be saving to provide their pension, but the fact that a benefit would be paid until death, with

2. It would be most plausible to do this on the basis of a funded pension with private companies investing the contributions of future pensioners. It is hard to see any particular rationale for the private sector collecting contributions and paying out benefits on a pay-as-you-go (PAYG) basis. But a funded system would fail to meet its own objective in the first place if what was required was to provide an adequate level of pension to those over retirement age; for it would take a generation before adequate funds were invested to provide such pensions.

the state bearing longevity risk, would make it quite reasonable to consider such a benefit a pension. The state could well carry out its role in providing a minimum in this way.

The state could go further and only provide a guaranteed income level by topping up the incomes of those with inadequate resources rather than by providing benefits for all irrespective of income. Income support currently plays this role to an extent. It is less clear that such provision can be called a pension, since to the extent that other incomes vary, there is no guarantee that the means-tested benefit will continue to be paid. Australia is the most obvious example of such a means-tested 'pension' system.

The current basic pension system in the UK has, however, been based on some concept of social insurance since Beveridge published his report setting out the role of the state in providing an absolute minimum living standard in retirement. But difficulties in defining this 'absolute' standard immediately call into question the role of the pension as simply one of poverty alleviation. The view of poverty as relative has been instrumental in leading to an increase in real pension levels over time within the social security programme. The real value of the basic pension doubled relative to prices between 1948 and 1973 (largely after 1960), and income-tested benefits continued to rise even after National Insurance benefit levels stabilised in the 1980s.[3] Even basic provision is intended to do more than allow mere survival.

Beveridge believed that flat-rate benefits should be paid for by flat-rate contributions so that there would be some genuine element of social insurance in the scheme, in the sense that benefits would be related to contributions. The increasing financial burden on low earners made this unsustainable and the flat-rate pension is now earned through earnings-related contributions.

As a result of this and of the diversity of the population, there is a complete lack of relation between contributions paid and benefits received. There is little of genuine insurance left in the current state pension scheme.

3. Wilson (1974). See also Dilnot, Kay and Morris (1984).

The original vision of 'social insurance' was essentially backward-looking, to the world of insurance provision by friendly societies in the era in which Beveridge's key ideas had been formulated. These societies and private insurance companies provided various types of contingency-related insurance in the first quarter of the twentieth century. But whereas private insurance companies would apply standard individual risk-rating techniques in the field of life insurance, friendly societies offered uniform ill-health or death benefits to relatively homogeneous groups of workers (in, say, particular occupations) and their families. Such risk-pooling, or 'social insurance', did indeed prove feasible for a time among homogeneous sub-populations.

But Beveridge's concept of 'social insurance' involved aggregating this concept to provide contributory risk-pooled insurance against certain specific contingencies (ill health, unemployment and poverty in old age) to the whole population, despite the heterogeneity of risks thereby incurred. As a result, social insurance is highly redistributive within generations.[4] But because there is no clear relationship between individual benefits and individual contributions, 'social insurance' contains no meaningful insurance component.

PATERNALISM AND EARNINGS-RELATED PROVISION

Even the flat-rate part of the social insurance system that we have already discussed is paternalistic. The state ensures not only that all have incomes at least at a certain level, but that all have a basic pension in addition to any private income that they might have. In most countries, the state goes much further and forces individuals to make earnings-related pension provision in addition.

The argument for paternalistic state involvement is that individuals are 'time inconsistent' in their savings decisions. In particular, when they are old, they regret not having saved when they were young. Consequently, some agent — typically the state,

4. See below, and Creedy and Disney (1985).

but possibly the individual's employer — should step in and provide an additional pension. For example, if it was believed that individuals would like to retire with a similar level of potential consumption spending to that enjoyed during their period in work, the pension should be related to earnings, perhaps even to final earnings.

The central question is whether it is part of the role of the state either to provide a pension in excess of a minimum or to force people to provide their own with or without a subsidy. It is then open to question whether any such benefit should be earnings-related, and if so, how. Two issues are often muddled in this debate. The first is whether people, left to themselves, optimally allocate their consumption over time. If it is believed that they do not and that they save inadequate amounts, because they are myopic or irresponsible, then the state should ensure that they do what is really good for them. The second issue is whether adequate options are actually available to people. Many do not have access to company schemes and might find the charges in personal schemes prohibitive. But this second problem does not necessarily imply a compulsory state scheme, rather the provision of an option suitable for otherwise excluded groups. Finally, one could argue that with very low universal state benefits, ensuring that people have supplementary provision reduces reliance on state-provided means-tested benefits in retirement.

If these arguments are accepted as demonstrating that some benefit above the minimum should be required by the state, it is not clear that this should take the form of earnings-related social security benefits. As is demonstrated in the next section of this chapter, the particular structure of pension benefits and contributions within the British social security programme provides often confusing and *ad hoc* forms of inter-generational redistribution (between generations) and vertical or intra-generational redistribution (within generations). It is hard to believe that policy-makers (or would-be policy-makers), let alone the public, understand these consequences and so the paternalist rationale remains unclear. As Wilson (1974) wrote, in a perceptive essay concerning social security provision,

> *Many people would go beyond [means-tested assistance] and support flat-rate pensions received as of right by all who are citizens. Even if some of the recipients have income from other sources and do not need such pensions to protect them from poverty, this need may be sufficiently widespread for a general scheme to be justified on grounds of convenience. But graduated pensions imply a still further departure from need and it would be natural to suppose that such pensions would have provoked more debate and disagreement than appears to have been the case.*

Nevertheless, the view arose among influential figures in the Labour Party in the 1960s that pension policy should not just reduce *poverty* amongst pensioners but also reduce *inequality* amongst pensioners. In turn, this view rested on developments in private provision that were perceived to be inequality-enhancing.

The Beveridge concept of National Insurance envisaged a role for private provision, above the universal pension 'floor' provided by the state. The development of occupational pension schemes in the post-war period partially filled this gap. But it was argued that 'Two Nations' of pensioners were developing: those reliant on the basic flat-rate pension were officially in poverty, given the relationship between the National Insurance level of pension and the National Assistance level, while others benefited from tax-privileged 'occupational welfare' benefits to supplement their income.[5]

One solution to this perceived problem of inequality might have been to have curtailed the tax privileges of occupational pension schemes (particularly the tax-free lump sum) while providing more generous social assistance to those with no other source of income. Instead, Richard Crossman[6] and his advisers believed that the duty of the state should extend to providing pensions as attractive as occupational benefits to those who were not covered

5. Titmuss (1963, 1976).
6. Richard Crossman was Secretary of State for Social Services from 1968 to 1970 during the Labour administrations of 1964–70.

by private schemes. Indeed, some proponents believed that public provision could thereby supplant private provision entirely.

The alternative view, originally espoused in the Keith Joseph[7] plan, later resurrected in the original Fowler[8] proposals, was that private pension coverage should be extended to a greater segment of the population. This would ultimately involve more generous tax treatment, since employers or providers would need extra incentives to provide pensions to individuals whom they had not previously considered it profitable to cover. Either way, a paternalist motive for extended provision became the accepted wisdom, whether through greater state provision (the Labour route) or through greater private provision (the Conservative route). This battle of philosophies occupied much of the late 1960s and early 1970s.

The ultimate introduction of SERPS was a compromise between these positions, allowing existing occupational pension schemes to contract out. It was a costly solution. Not only was it designed to reduce the inequality in pensions provision between the occupational pensions sector and other pensioners, but it was also designed to reduce inequality between the sexes. For occupation-based welfare programmes did nothing to rectify the inequality between the sexes. Provisions such as final-earnings-based pensions were less advantageous to women. In addition, many widows lived in poverty and, it was argued, should benefit from their spouse's accrued entitlements. These considerations underpinned the Castle[9] plan, which was implemented by Social Security Act 1975. Its planned generosity was approximately halved by the 1986 Social Security Act.

In fact, as described in Chapter 2, the majority of workers are covered not by SERPS but by private schemes — occupational or personal — which have opted out of SERPS. The state sees its role

7. Keith Joseph was Secretary of State for Social Services during the Conservative administration of 1970–74.
8. Norman Fowler was Secretary of State for Social Services from 1981 to 1987.
9. Barbara Castle was Secretary of State for Social Services from 1974 to 1976 during the Labour administration of 1974–79.

not necessarily in providing the second tier of earnings-related pension itself but in ensuring that all employees[10] have some form of earnings-related provision. Those contracted out receive compensation for giving up future rights to SERPS through rebates on their National Insurance contributions. Here, the state is forcing all workers to have a pension in excess of the basic and effectively providing a back-up scheme for those unable or unwilling to use the private sector. The state is also regulating the private sector by requiring minimum benefits from (in the case of defined benefit occupational schemes) or minimum contributions to those schemes that opt out of SERPS. It also has a much wider role in the regulation of private sector schemes, a role which is discussed in far more detail in Chapter 7.

Allowing opting out of a state scheme results in those who obtain 'low returns' from the social security programme having a tendency to opt out, rendering provision more costly for the rest. Conversely, those who earn higher returns from the state scheme have every incentive to vote for higher state benefits. With PAYG finance, the cost of this process is borne by future generations; there is a natural tendency to respond to differential rates of return by compensating existing losers and raising the implied costs to future generations.[11] As a result, pension policy becomes neither consistent and stable, nor financially sustainable in the long run.

Once it becomes accepted that pensions should no longer be based solely on 'need', that the state has a role to play in providing 'inequality-reducing' pension programmes, but that individuals could opt out (particularly attractive to those adversely affected by redistributive policies), it becomes more difficult to maintain a control on pension spending and tax incentives. PAYG finance allows the 'burden' to be passed on from generation to generation. Ultimately, some generations will suffer. It is this question of 'inter-generational equity' which is considered next.

10. Strictly, all employees earning above the National Insurance lower earnings limit.
11. Browning (1975).

3.2 Redistribution and the State Pension System

In a contributory PAYG-financed state pension system such as that which we have in the UK, there are a number of ways of looking at the issue of redistribution. In this section, we consider the issue from both intra-generational and inter-generational perspectives. In the first case, the income redistribution that the state pension system causes between individuals in the same generation is considered. In the second case, the redistribution that the state system causes between different generations is analysed. In both cases, a lifetime perspective is taken, looking at both contributions and pension payments.

INTRA-GENERATIONAL REDISTRIBUTION

Here we look at the redistributive effects of various types of policy from the perspective of the lifetime over which individuals make contributions and receive benefits. Policy changes as they affect pensions are long-term. Higher pensions imply higher contributions, so that while people will be left better off in retirement, they will be left worse off while at work. Higher pensions also involve a degree of redistribution towards those who live longest.

Creedy, Disney and Whitehouse (1993) look at the intra-generational redistribution implied by the current state pension scheme by looking at the contributions and pension receipts of a single cohort of men over their lifetimes. They do this by modelling lifetime earnings profiles, from which both contributions and entitlements to the state pension can be readily calculated, and by taking explicit account of differences in expected mortality according to the individual's occupation. In order to concentrate just on the intra-generational redistribution inherent in the scheme, they assume the scheme is in steady state and impose lifetime average revenue neutrality. This requires that, in the aggregate, accumulated contributions up to retirement equal discounted benefits at retirement. This assumes that the population is in steady state — where this is not the case,

significant inter-generational redistribution can occur and so the waters are muddied when looking at intra-generational effects.

Creedy et al. find that, subject to these assumptions, the current state pension scheme in the UK (including SERPS) makes very little difference indeed to lifetime income inequality. In other words, the state pension scheme as a whole involves minimal redistribution from high earners to low earners.[12] Considering that the basic pension is flat-rate and is paid for by earnings-related contributions, this is a somewhat surprising result. The redistributive nature of the system is partly offset by the existence of the upper earnings limit to National Insurance contributions, but more important, as it turns out, is differential mortality. There is, among men, a strong positive correlation between earnings and life expectancy. So higher earners on average receive the state pension for longer than their lower-earning counterparts and this is sufficient to offset the earnings-related nature of the contributions.[13]

Looking at the redistributive impact of reforms to the pension system from this intertemporal perspective can also provide new insights. Consider, for example, the proposal that the basic pension should be uprated annually in line with earnings, rather than with prices as at present. This is generally considered to be a redistributive policy taking from earners, with high incomes on average, and giving to pensioners on generally lower incomes. And from a one-period perspective this is true. But over the lifetime of a particular cohort, the higher eventual pensions will have to be paid for by higher contributions, and the higher pensions will again go for longer periods to the longer-lived, that is, the lifetime rich. Creedy et al. find that the intra-generational redistributive effect of such a policy would be minimal by comparison with the current system of uprating. In fact, they find that the Gini

12. But note that the study excludes women, towards whom the state scheme is redistributive in this sense. It also excludes the unemployed, who receive entitlement to the basic pension without making contributions and to whom the state scheme is therefore also redistributive.
13. See also Creedy (1982).

coefficient for lifetime income would be identical under the two policies.

Because the level of the basic pension is tied to the level of the UEL and the LEL, different indexation procedures for the pension also affect these. As such, they also affect rights to the basic pension and SERPS. Indexation of the basic pension in line with earnings would result in the LEL being higher than otherwise, thereby excluding a number of very low earners from the state pension system altogether. The higher UEL would also extend the range of earnings over which SERPS entitlements are earned and so increase the eventual SERPS payments to higher earners.

Clearly, the redistributive effect of state pension provision as a whole is reduced because some of the contributions are used to pay for an earnings-related rather than just a flat-rate pension. Creedy et al. show the distributional effects over the lifetime of abolishing SERPS and making an equal-cost increase in the level of the basic pension. This is shown to have a significant equalising effect on the distribution of lifetime income by comparison with the current situation.

These observations regarding the intertemporal and intra-generational effects of different pension policies indicate the importance of taking a lifetime perspective when it comes to measuring the redistributive effect of pensions policies and of looking at the effects of current policies on the incomes of future pensioners. Over the lifetime of an individual, not only does the level of the pension matter, but also the length of time for which the pension is received and the level of contributions that have to be made.

INTER-GENERATIONAL REDISTRIBUTION

Above, we looked at just the intra-generational redistribution involved in the UK pension system, but in a PAYG pension scheme, the contributions of working generations pay the pensions of other generations who have already retired. The PAYG nature of the scheme means that the revenue raised in contributions must exactly finance current pension payments. So a change affecting pension provisions — for example, greater generosity of prospective pension benefits or an ageing population

— will change the value of the stream of future benefit payments and contributions levied. This in turn changes the implicit 'rates of return' received by successive generations within the scheme.

Making calculations of these rates of return for different generations is not straightforward, as each is first a contributor to and then a beneficiary from the scheme. The size of each generation is also important: it is likely that a small generation followed by a large generation will be treated more generously since the costs to each contributor of financing a given pension for each retired member of the smaller generation will be smaller. Because of differences in generation size, there is no reason why the rate of return should be the same for all generations: a generation living in an environment where population is growing, and growing richer, should get a higher rate of return on its contributions over time than one where population and real living standards are stagnating.

AN ILLUSTRATION: RATES OF RETURN TO MEN IN THE BRITISH STATE PENSION SYSTEM

To illustrate differences in rates of return between generations in the public pension component of the social security programme, we compare the four generations of men born in 1935, 1945, 1955 and 1960 and therefore retiring in, respectively, 2000, 2010, 2020 and 2025.[14] The analysis uses pooled cross-section data from the Family Expenditure Survey to calculate projected age–earnings profiles (allowing for real productivity growth) from labour market entry to retirement for each individual observed in the FES sample.[15] Contributions and pension entitlements are modelled based on the existing legislation, and contribution rates

14. Further details can be found in Disney and Whitehouse (1993b). Returns are calculated assuming everyone is contracted into SERPS. Contracting-out further alters the pattern of returns within and between generations. See Disney and Whitehouse (1993a).
15. See Disney and Whitehouse (1991a), and Section 4.3 below.

TABLE 3.1

Rate of Return on National Insurance Contributions for Men, by Cohort

Per cent

Cohort (year of birth)	*Price index*	*Earnings index*
1935	2.4	4.0
1945	0.4	1.7
1955	–0.2	0.9
1960	–0.3	0.8

Source: Disney and Whitehouse (1993b).

are based on the presumption of PAYG equilibrium in each period.[16]

Table 3.1 shows the mean returns to each of these cohorts. In general, younger cohorts do considerably worse than older cohorts, with the 1955 and 1960 cohorts seeing negative returns on average with continued price indexation. With earnings indexation, the later generations would see positive returns, but even then, only just. These *inter-cohort* differences stem from:

- the declining value, relative to earnings, of the basic flat-rate (lump-sum) pension, which is indexed to prices;
- the gradual ageing of the population, inducing higher contribution rates for those in work at a later stage;
- the reduction in the Treasury Supplement to the National Insurance Fund, particularly in the 1980s, also inducing higher contribution rates for those in work at a later stage;
- the accelerated accrual of early members of SERPS, with accrual rates declining over time.

16. Thus we are considering inter- and intra-generational redistribution at the same time. Elsewhere (Creedy, Disney and Whitehouse (1993)) we have looked at intra-generational redistribution under 'steady-state' assumptions of lifetime revenue neutrality (each cohort's contributions set equal to the value of its benefits).

Evidence on the abortive Crossman scheme,[17] and for the US,[18] shares the same general result: earlier generations always do best out of a given PAYG-financed pension scheme. This is why there is always pressure, notwithstanding demographic changes, for continued improvement of social security programmes, since younger generations see their return eroded relative to their parents' and their predecessors'.

The relevance of declining rates of return is felt not just in the demand for continued improvements in social security but also in relation to an 'outside option'. In Britain, individuals can contract out of SERPS into various private pension arrangements. They can be expected to do so where, net of transactions costs, the outside return exceeds the 'return' on the social security programme. As can be seen from Table 3.1, a positive outside return would probably be sufficient to induce contracting-out on a large scale among workers in the 1955 and 1960 cohorts. The rapid growth of personal pensions in part reflects this growing pessimism among younger cohorts as to the return on remaining contracted into SERPS in the future.

3.3 Methods of Financing Pensions and their Effects

In recent years, there has been a growth of interest in industrialised countries in financing social security programmes from an accumulated fund, rather than by PAYG financing. In the US, for example, the series of financing crises which beset the PAYG old age, survivors and disability scheme (OASDI) in the 1980s has led to a shift towards a partially funded basis for the social security programme. In Britain, there has recently been enhanced interest in transforming the system of pension provision into a wholly funded scheme.[19]

17. Atkinson (1970).
18. Hurd and Shoven (1985) and Boskin, Kotlikoff, Puffert and Shoven (1987).
19. See, *inter alia*, Falkingham and Johnson (1992) and Field and Owen (1993).

A number of concerns have underpinned this shift in emphasis towards funded social security provision:

- the projected growth of PAYG contribution rates associated with ageing populations;
- the projected growth of contribution rates associated with maturation of social insurance programmes. This stems from the failure of social security programmes to build up an 'asset reserve' (partial funding) during the period of transition from no social security to mature social security;
- the 'Ponzi game' nature of PAYG social insurance which, analogous to a chain letter, allows each generation to build up successively more onerous burdens of social security provision on successive (subsequent) generations, a process which is only likely to be curtailed by 'taxpayer rebellions' stemming from population ageing and the full effects of scheme maturation. It is argued that this dynamic instability of pension provision can be curtailed by making each generation responsible for its own pension provision, i.e. funded pensions;
- macroeconomic performance. It is sometimes asserted, often without any clear theorisation, or empirical evidence, that funded social security programmes raise the aggregate savings rate. In so far as macroeconomic performance is improved by high savings rates (advocates point to Britain and the US as countries that have low savings rates and are poor performers; Japan has a high savings rate and a strong performance), measures to raise the savings rate are justified;
- security of benefits. It is not clear which way this argument goes, but it has been argued that funded pensions are more secure than unfunded ones which depend on the willingness of future generations to shoulder a particular tax burden. The change in the indexation provisions for the basic pension in the UK has involved a steady reduction in pension benefits by comparison with what people might reasonably have expected. On the other hand, funded pensions are subject

to capital market risk — poor investment returns will lead to lower pensions — risk of fraud as exemplified by the Maxwell case and risk of government intervention through punitive tax changes.

THE CASE FOR PAYG FINANCE

These points apparently provide strong ammunition for at least partial funding. But as we shall see, in many respects the balance between social security programmes and private pensions, rather than between funding and PAYG financing, is the key issue. Nevertheless, there is a simple counter-case for PAYG finance under certain circumstances, which can be elaborated using a slight modification of the Samuelson (1958) model, as extended by Aaron (1966).

The essential point behind this model is that the optimal choice between funding and PAYG financing depends on the rate of return to contributions which in turn depends on the differential between the rate of return to investments and the rates of population and income growth. In a PAYG framework, if the population and real income levels are growing, then each generation of workers can afford to pay a higher pension to each generation of pensioners than that received by their predecessors. So long as the sum of population and real income growth is greater than the real return on savings, then PAYG financing has the potential to provide higher pensions than funding.[20]

In recent years in Britain, the opposite has generally been the case. For with an 'excess yield' of rate of return over real earnings growth of around 3.5 to 4 per cent[21] and allowing for typical investment charges on an individual savings account of 1 to 1.5 per cent,[22] the net yield in Britain exceeds the low rate of population growth. (There are more complex issues of uncertainty as to return and earnings growth which we leave to Chapter 5.)

20. Aaron (1985).
21. Combined Actuarial Performance Services (1993).
22. Walford (1993).

So the Aaron–Samuelson 'rule' would suggest that funding is just about preferable to PAYG financing in Britain's ageing population. But there are considerations that mitigate this conclusion. If generations are altruistic towards their parents, they will be prepared to make contributions — whether voluntary or through the state PAYG system — to increase their parents' welfare. A utility-maximising parental generation (if not too risk averse) might take advantage of this to destroy a funded equilibrium (that is, each generation saving for its own retirement) by spending its lifetime income and relying on altruism in its children to obtain an income in retirement.[23] This seems a little far-fetched, but it should be noted that those who believe that social security is motivated wholly by altruistic, or redistributive, motives often ignore the possibility that such behaviour is anticipated and accommodated.

MACROECONOMIC EFFECTS OF FUNDED VS. PAYG FINANCING

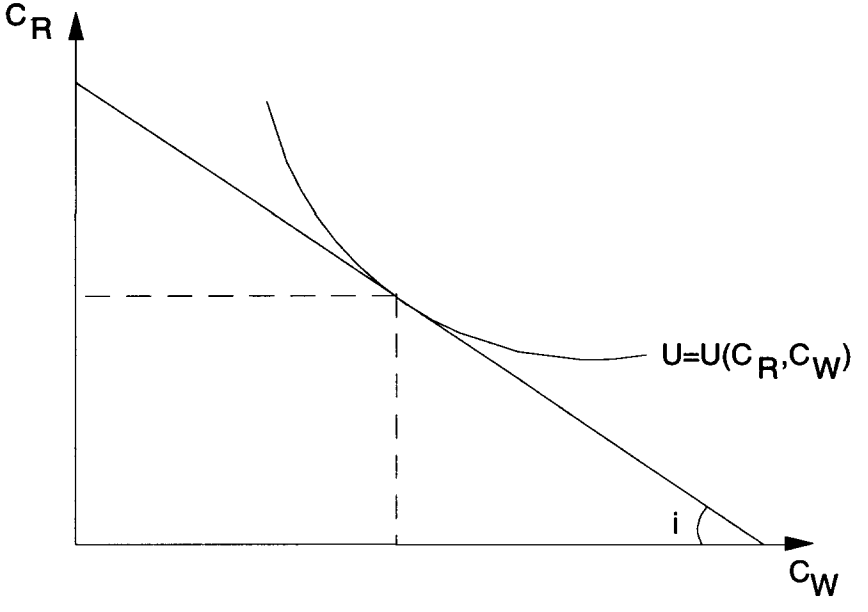
Does a funded pension scheme improve macroeconomic performance? Here, this is taken to mean: does a funded pension scheme increase total saving? There are reasons for thinking that it does, but only under certain specific assumptions and institutional structures. (Though even if it does, it does not immediately follow that economic performance will be boosted. Britain is a small open economy with access to international capital. Increased domestic saving need not increase domestic investment and, therefore, domestic production.)

We can consider the issue of increased saving using a straightforward diagram from microeconomics. Assume that there are two periods to the lifetime: work (W) and retirement (R). It does not matter whether length of life is known, so long as there is a functioning annuity market. The only source of labour income, Y, is earned during work. Any saving, S, in the first period earns a rate of return, i. In order to maximise utility, the consumer will

23. Veall (1986).

FIGURE 3.1

The Basic Framework



save so as to equate the marginal utility of consumption in the first period, $u'(C_W)$, to the discounted marginal utility of consumption in the period of retirement, $u'(C_R/(1+i))$. Under any other circumstances, the consumer would be able to increase lifetime utility by shifting consumption between periods by saving more or less until an extra unit of consumption was worth the same in each period. This simple outcome is depicted in Figure 3.1.

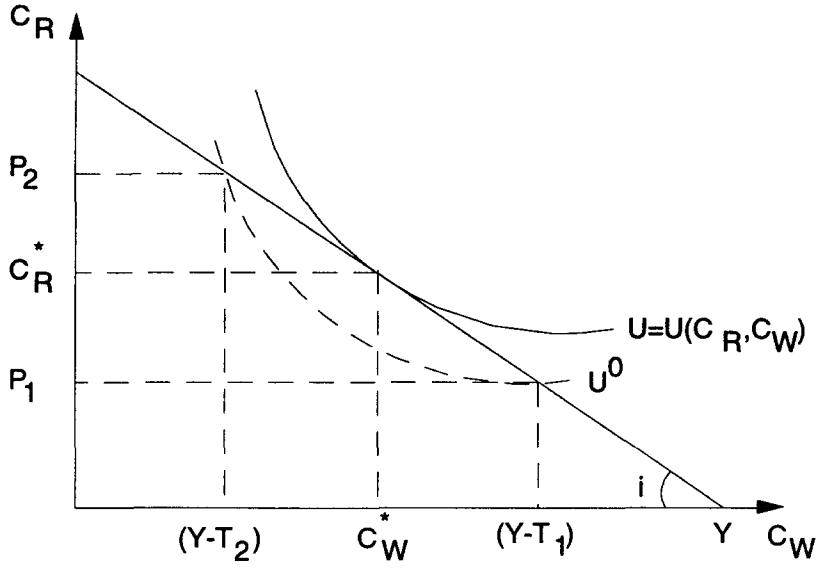
Total earned income Y is divided between consumption in the first period (C_W) and saving (S_W), which yields C_R in retirement, or $S_W(1+i)$.

Suppose now that the Government introduces a PAYG social insurance scheme 'earning' the same rate of return i, financed by a payroll tax (T) on workers and yielding a pension $P=T(1+i)$. There are two possibilities, subscripted 1 and 2 in Figure 3.2.

In Case 1 (subscript 1), the contribution tax is T_1, yielding a pension P_1. Desired consumption in the first period is C_W^* and in

FIGURE 3.2

Impact of Social Security and Over-Annuitisation



retirement C_R^*. The individual therefore consumes C_W^* in the first period, pays taxes T_1 and saves $S_W=Y-C_W^*-T_1$. Private saving, S_W, has been reduced by exactly the amount of the tax, T_1. The result is that, although consumer welfare is unchanged, private saving is reduced one for one by government pension taxes.[24]

What happens to total saving? Since government transfers are not conventionally defined as 'saving', total saving has fallen by the same amount. As drawn, total output and consumption are unaffected, but private saving is lower and government expenditure is higher. If, ultimately, higher taxes have adverse impacts on labour force participation and effort, however, total output and consumption may be lower than they would otherwise be.

24. This is the Feldstein (1974) empirical result.

In Case 2 (subscript 2), the tax, T_2, actually exceeds desired saving by the individual in the working period. Also, the pension, P_2, is higher than the saving that the consumer would have undertaken in equilibrium (assuming consistent preferences over time). We can say that the consumer is 'over-annuitised': he or she would prefer more consumption in the working period. This outcome is not just a theoretical possibility, especially where there are additional private pensions or where after-tax pension/earnings replacement ratios are very high; see also Appendix 3.1. But the fall in private saving is here less than the tax rate, albeit utility is lower (U^0 instead of U) as a result of the pension tax. If the individual could borrow freely (though in the real world this is unlikely to be possible) during the first period, then he could of course offset this excess saving on his behalf by the state and pay any borrowing off during retirement, thereby reversing the usual expected pattern of private saving and borrowing behaviour.

OBJECTIONS TO THE BASIC MODEL

There are several objections to this simple model as it stands.

- Individuals may have inconsistent preferences.
- Individuals may not face efficient capital markets (although individuals usually face constraints on borrowing, not lending, i.e. saving).
- Individuals may save for precautionary motives, and not just for retirement. Consequently, the substitution of public tax-financed pensions for private saving is not one for one; furthermore, social security may provide insurance against income risk. By reducing the need for precautionary saving, however, social security may reduce private saving still further.
- Private retirement saving and social security programmes are not perfect substitutes. Because social security redistributes between individuals, various people may be better off or worse off. These effects may not cancel out in the aggregate.
- The 'return' on social security may differ from that on private saving, since there is no reason why the rate of

interest, i, should be exactly equal to the sum of population and income growth. Suppose the former is higher. Then PAYG provision has an adverse income effect on consumption in both periods. Additionally, social security programmes may affect the market return, i, especially if they are funded. With a lower return, there are both income and substitution effects on saving, and we cannot a priori say whether the impact on the allocation (as opposed to the level) of consumption will be positive or negative.

FUNDING SOCIAL SECURITY PROGRAMMES IN PRACTICE

Although Figures 3.1 and 3.2 give several illustrations of how social security programmes might affect consumer welfare and private saving, it is not always the case that funding rather than PAYG financing of social security will make any difference to total savings.

In the US, for example, revenues collected by the Social Security Trust Fund (the funded component of the social security scheme) are lent back to the Government in the form of US Treasury bonds. Issue of such bonds is a means of financing the US public sector deficit. The Trust Fund, instead of private purchasers, therefore holds government IOUs, and the Treasury, in effect, retains commitments to future transfer payments. This is a more roundabout method of PAYG financing, and behaviour would only be affected in so far as people believed that their social security benefits were more (or less) secure as a result (assuming that they understood the process).[25]

The issue here, of course, is that the Government promptly spends the proceeds of the funded social security programme. Private saving falls, but the funding of the scheme does not produce an offsetting increase in public saving. So total saving falls: the funded scheme allows a relaxation of the Government's

25. See Kotlikoff (1992).

budget constraint. If, somehow, the social security fund was 'earmarked' as a special form of public saving which was invested in projects which otherwise would not have been undertaken and which earned a positive rate of return (for example, increases in the capital stock), as a result of which future income streams would be higher, total saving might be maintained. Chile has illustrated this possibility by allowing the surpluses of its pension funds to be lent on international capital markets.

But in general it takes a degree of self-restraint unusual among Governments for a publicly funded programme for raising extra tax revenue to be 'ring-fenced' in this way. For this reason alone, it seems plausible to argue that it is the extent of private pension provision versus social security, rather than the method of financing social security *per se*, which has the principal impact on savings and capital accumulation, with privately funded programmes more likely to generate higher total saving than public social security provision whether funded or PAYG financed. It then becomes hard to explain the relatively low national savings rates in the UK and US on the basis of pension structure, since both countries have relatively high degrees of private provision.

FUNDING THE BASIC STATE PENSION AND TRANSITION COSTS

Because of the higher rates of return that can be earned on contributions to a funded pension under current demographic circumstances, and because of possible benefits to the macroeconomy of pension funding, there have been a number of proposals recently suggesting that funding of pensions in the UK should be extended to the basic state pension.[26] Here, we briefly assess the economic feasibility of such a change. There is, after all, no inherent reason why basic provision should not be funded. In many countries, including France and Germany, there was a period during which first-tier state provision was funded; and in

26. See, for example, Field and Owen (1993) and Falkingham and Johnson (1992).

Chile, the 'core' insurance scheme of pension provision is wholly funded.

Whatever the merits of funding, any proposal to change the method of financing the basic pension has to overcome one major obstacle — the transition costs. Because funding requires current workers to put money into a fund, they or the Government would have to shoulder this burden. However, they would not be able to divest themselves of the burden of paying for the pensions of those who have already retired. For all current pensioners would have to continue relying on the pension paid for by current workers. So current workers would have to pay both for their own pensions and for those of the currently retired population. The costs involved are discussed below.

The second important point about funding the basic pension is that it can provide no way for the state to withdraw from pension provision. For without state intervention, none of the intra-generational redistribution implicit in a flat-rate pension would be possible. The state could not simply withdraw from the financing of first-tier pension provision and insist that everyone fund their own pension without effecting a major reduction in its redistributive activities and imposing a serious burden on low earners.

The first-year cash-flow cost of allowing all NI contributors to put enough money into a fund to replace just the basic pension they would otherwise accrue would be of the order of £12 billion. The Government could force individuals to carry on paying the same rate of NI as at present and in addition put the requisite amount of money into a fund. Alternatively, it could reduce their contributions appropriately and find the extra money from increased taxation elsewhere. In either case, the huge annual cost would see no return in terms of lower public spending for many years. There would be no point in the Government paying for the transition by increasing borrowing since this would, in effect, be just another way of deferring costs, just as PAYG provision already does. Transition costs of this order of magnitude are an inescapable part of any possible scheme to move towards funding of any pension that is already being paid to current pensioners on a PAYG basis.

3.4 Market Failure and Economic Efficiency in Pension Provision

The provision of pensions may, like that of many other goods and services, be subject to market failures, which result in economic inefficiency. Market failures can arise for two main sets of reasons: monopoly or monopsony power wielded by one party, and asymmetries of information between two parties to a transaction. In the second case, the problem arises when one party can affect the value of the transaction to the other party, but there is no contractual mechanism by which the second party can either monitor or enforce the outcome. Both of these forms of market failure can occur in pension provision, and so impinge both on individual pension choice and on the economically optimal structure of pension provision. Public provision has sometimes been put forward as a means of overcoming market failure, although it should be noted that, so long as the asymmetries of information or sources of market power remain, the inefficiencies in provision may not wholly be overcome.

ANNUITY MARKET FAILURE

As discussed in Section 3.1, a pension is a form of insurance against the 'risk' of longevity. Insurance markets, in general, are subject to two types of market failure arising from asymmetry of information, which are generally known as moral hazard and adverse selection.

Moral hazard occurs when individual behaviour affects the insured risk but insurance firms cannot monitor actions that increase or reduce risk. For example, once someone has insured their car, they may take less care to avoid minor accidents. In the pensions case, the moral hazard argument in the context of longevity would be that individuals covered by pension insurance would take action to prolong their life once insured, by giving up smoking or choosing an appropriate diet. Assuming that people desire longevity in any case, there is probably no real potential for moral hazard. However, in some contexts, such as the possibility of early retirement on grounds of ill health in

occupational schemes or the timing of effort and earnings to maximise benefits in final salary schemes, the problems caused by moral hazard might be more serious. Even so, insurers would in practice monitor such potential risks carefully.

Adverse selection, however, is more serious. Again, the market failure arises from an asymmetry of information between the insurer and the individual. People may know more about their life expectancy than the pension provider, for example, through knowledge of their own medical history.[27] Because the pension provider cannot distinguish different annuitants' risks of longevity, they have to sell at the same annuity price to all. The pension firm may start by selling annuities that are profitable at the average level of longevity in the population. But individuals with a high risk of mortality, who are aware of this, will not then buy annuities at the 'average' rate, since the return to them is poor compared with other riskless assets. The average longevity of annuitants therefore rises above the population average, and so annuity prices have to rise for the pension firm to avoid bankruptcy. If individuals knew exactly their longevity, and insurers knew nothing, then this process would continue until the annuity market disappeared. In practice, the informational asymmetry is not so large, and so the market will reach an equilibrium with prices above those that would pertain with perfect information. The 'failure' in this market is that either those with high mortality do not purchase annuities (the market is missing), or if they do, then they get a bad deal. If markets are not 'fair' to annuitants, then the pension system is economically inefficient.

In practice, insurance markets have developed ways of mitigating the effects of adverse selection, some of which are relevant to pensions. One is to minimise the extent of the informational asymmetry, by individuals either 'signalling' information about their risk to their insurer or signalling the fact that they have as little information as the pension provider. In the pensions market, people may find it difficult in practice to

27. Rothschild and Stiglitz (1976).

convince an insurer that they have given *all* their information regarding their own longevity when the insurer is aware that they may have such information. In contrast, it is easier for the individual to convince the insurer that they have *no more* information than the insurer about their longevity. Purchasing annuities when young or pre-committing to annuity purchase at an early age means that neither party has much information about individual mortality. The adverse selection problem is reduced, improving economic efficiency, because low-longevity-risk individuals are less likely to be aware of this when still young, and so continue to buy annuities.[28]

A second approach to correcting the market failure is the pooling of risks, to ensure that longevity of annuitants is the same as longevity for the population as a whole. Compulsory scheme membership (imposed either by government or by an employer) would obviously eliminate adverse selection, except in so far as there is self-selection of individuals into particular firms in the case of employer-provided plans.[29] Again, economic efficiency is improved.

The potential for adverse selection and the possibility of risk-pooling may be one reason why private pension contracts are often presented in a group form, such as an occupational pension scheme. Nevertheless, the differential tax treatment in the savings market would seem to be a prime reason why the private annuity market is so small whilst the organised pension market is large. The extension of the more generous tax treatment[30] of savings to personal pensions in the late 1980s led to an explosion of coverage; see Section 2.3.

28. Brugiavini (1993).
29. Note that the Government Actuary (1992) assumes that the mortality rate for occupational pensioners is 10 per cent below that of the general population (at the maximum gap), although this may reflect a correlation between income and mortality, since those with occupational pensions tend to be better off.
30. In particular, the contracting-out regime.

EFFICIENT CONTRACTS

Even if differential fiscal treatment explains the predominance of group coverage, it does not necessarily explain why firms provide pensions. In order to explain the role of employers, it is useful to allude to a second source of market failure: the area of labour contracts. The problem again is one of asymmetric information, this time of how much effort a worker puts into a job.

The moral hazard argument has a number of strands as applied to labour contracts. First, firms and employers cannot legally commit to long tenure contracts, even when labour turnover is costly to the firm, for example in the form of training and hiring costs. This is a result of potential moral hazard: effort is adversely affected by guaranteed tenure. Assuming effort is impossible or prohibitively costly to monitor completely,[31] there are gains to the worker from shirking so long as remuneration at any point in time reflects target or average effort. However, back-loading pay, through earnings profiles that rise with tenure or the offer of a pension at retirement, raises the cost of shirking if it is detected. Any alternative employment will offer a lower net remuneration if current earnings and pension accruals are related to job tenure.[32]

Adverse selection may also arise when the firm cannot monitor the productivity of hires or quits. By offering seniority-based wage profiles or a pension, employers may be able to attract (on average) more productive workers, whereas offering a minimum pay and fringe benefit package may guarantee only that the least productive workers apply or indeed stay with the firm.

Offering occupational pensions may be more effective than seniority-based pay profiles as it is possible to extend the duration of the disincentives to mobility and shirking, so long as the generosity of the pension provision depends on the timing and duration of job tenure. However, a problem emerges where firms use these mobility-reducing devices. A 'tilted' profile of earnings

31. Assuming, of course, that workers are averse to effort when not monitored.
32. The theoretical literature in the pension context includes Lazear (1981, 1985), Viscusi (1985) and Ippolito (1991).

and pension with age will mean that younger workers typically earn less than their productivity warrants (bar any specific training by the firm) while older workers may be earning and accruing pensions entitlements the sum of which far exceeds productivity. Firms may find workers unwilling to leave voluntarily at the point that is optimal to the firm, and so back-loaded remuneration plans of this type are often associated with mandatory retirement.[33]

Furthermore, there is a limit to the degree to which pension benefits can be back-loaded. Younger workers will know that there is a finite probability of their leaving the firm before retirement; indeed, there is also the possibility of bankruptcy, take-over or the firm simply reneging on the implicit contracts to pay higher wages and/or substantial benefits in the future (particularly as this total remuneration exceeds productivity). Any back-loaded pension scheme involves significant redistribution from early leavers to the few who survive to retirement (Section 7.2). This risk of moral hazard to the firm places a limit on the extent of back-loading that the firm can implement while still attracting younger entrants. Moreover, the firm faces a trade-off: some degree of mobility is optimal, even if only to separate out inefficient matches of workers to firms ('square pegs in round holes'). Otherwise, some workers would have 'excess' job durations when incentives to remain with the firm are strong. Finally, pensions may not be the most efficient form of 'golden handcuffs'. There are more effective ways in which shirking and mobility can be discouraged, such as the deposit of a bond by an employee or employer repayable at some future date conditional on tenure or effort.[34]

It is often argued that incentives were the reason for the development of occupational pensions in the twentieth century, given a shift in employer preferences for a more stable tenured work-force. A second reason was trade union pressure for an extension of fringe benefits to the whole work-force. This is hardly surprising given the attractiveness of defined benefit pensions to

33. Lazear (1979).
34. Akerlof and Katz (1989).

workers on seniority-based pay profiles with long tenures, particularly in firms with 'LIFO' or last-in, first-out employment arrangements.[35] However, more recently there has been a greater emphasis on labour market 'flexibility'. It is no surprise that there has been an increase in interest in pension 'portability' and in pension schemes (notably defined contribution schemes) that are transferable.

AGENCY PROBLEMS IN PRIVATE PENSION PLANS

Pension plan design has important implications for the rate of return on investments to individuals and so for the value of pension benefits, both in defined contribution plans and (indirectly) in defined benefit schemes. However, pension fund management is a classical 'principal–agent problem', again stemming from informational asymmetries. Managers of schemes have to judge what risk–return mix is desired by members. In turn, the 'agency' problem may mean that managers follow their own goals in portfolio management.

'Agency slack' — put simply, no one cares as much about your money as you do — implies under-performance of the fund relative to the market, either through poor investment strategy or by choice of a portfolio which is less risky than that desired by participants: for example, strategies that are 'satisficing' (generating some acceptable minimum return) rather than 'maximising' through active fund management.[36]

'Management slack' arises where pension portfolios are internally managed by the company offering the pension rather than by outside agents, presumably recruited by some competitive process. As with agency slack, it is difficult for the individual employee in a pension plan acquired incidentally as part of the employment contract to disentangle the component of remuneration that constitutes pension accrual. Defined benefit plans rarely provide details as to accrued individual pension or

35. Ghilarducci (1992). See also Hannah (1986) for a British perspective.
36. Lakonishok, Shleifer and Vishny (1992).

fund performance. Nevertheless, poor performance feeds through in the form of higher contribution rates and pressure on discretionary components of pension benefits (early retirement provisions, post-retirement indexation etc.).

Conversely, in individual defined contribution schemes such as personal pensions, the scope for agency slack is still present, but information provided to participants provides them with some ability to monitor outcomes and to choose whether an alternative option is preferable (a different saving plan, SERPS or membership of an occupational scheme if available). Management slack is reduced by competition between providers, which is absent when there is a single provider (the internal fund managers of the firm's scheme).

Whatever the type of pension benefits, the investment return is an important determinant of the value of benefits, which in turn is affected by the structure of the pensions market and the performance pressure this brings to bear on fund managers.

PENSIONS AND COMPENSATING WAGE VARIATION

It is possible that employers provide their contribution to an occupational pension scheme as an *ex gratia* 'bonus' on top of contributions from employees. However, economic analysis tells us that ultimately the employer's contributions will be borne (at least in part) by employees in the form of lower wages than they would have obtained in the absence of an employer's pension plan. Pensions are usually treated by economists, and increasingly by the law, as deferred pay. The interaction between current and deferred pay is most obvious in the orthodox theory of equalisation of net advantages in competitive markets.[37] Pay measured over the lifetime of an employment contract will be identical in jobs with the same non-pecuniary (dis)advantages, otherwise pay will vary to compensate for differences.

Quite how the burden of these 'compensating wage differentials' is shouldered is an issue of some debate in the

37. Smith (1776).

economic literature. But the assumption that an individual with a defined benefit pension scheme has exactly the same pay profile as an individual not covered by an employer's scheme who buys an annuity or remains in SERPS is a strong one, and is favourable to occupational pension plans. Any compensating variation in wages will take the form of a *lower* wage for the covered individual than for the employee who bears the full cost of purchasing their pension.

Direct tests of the compensating pay hypothesis with respect to pensions are rare. Some US studies, if anything, have found *over*-compensation (that is, pay is reduced by more than the discounted value of the pension benefit).[38] The implications of this are important. If people fully understand the relationship between pay and deferred pay (or pension), then it is to be expected that they will take account of the deferred pay element when bargaining over wages. Individuals who choose to take out their own pension may be able to negotiate successfully a wage premium to finance their pension contributions. If employers appreciate the role of compensating wage variations, then they will provide these pay premiums.

Again, however, the market mechanism might possibly fail here, for two reasons. First, firms may have other reasons for deferring pay, for example to generate a labour market incentive device, as described earlier in this section. A second problem again arises from adverse selection. Occupational pensions imply a substantial degree of 'redistribution' from short to long stayers and from low to high earners; see Section 7.2. If the losers from this redistribution are able to leave a scheme and negotiate finance for their own pensions, then the costs of providing pensions for those staying in the scheme would rise. As in annuity markets, adverse selection leaves the market with partial coverage and rising cost.

38. Schiller and Weiss (1980); also Woodbury (1983). Disney and Whitehouse (1990) summarise the remainder of the literature and present a simplistic empirical test for Britain; see also the discussion in Disney and Whitehouse (1994a).

3.5 The Timing of Retirement

We have already made it clear that the existence of pension systems has important effects on individuals' behaviour. During their working life, the main effect is on savings behaviour. But the availability, level and structure of pensions can also have important implications for the decision on when to retire. Conversely, an appreciation of the factors that determine when people do retire is vital in designing and understanding any pension system. Recent substantial changes in retirement behaviour in the UK, outlined in Section 2.5, illustrate the importance of this issue and have led to growing interest in it.

The most obvious factors that will affect retirement behaviour are an ageing population and increases in the wealth of new cohorts of pensioners. We consider the effect of ageing first.

Economic theory cannot by itself tell us how an ageing population will affect retirement behaviour. If the population is ageing because of increased longevity, then individuals will need a longer period in the labour force to obtain a given level of average consumption over their lifetime. This might lead to individuals prolonging their working lives by postponing retirement or to greater participation during the working life through higher hours or shorter periods out of the labour market around childbirth. However, with higher social security taxes under pay-as-you-go public pension systems, or if ageing takes the form of a stationary older population and a declining population of working age, then the disincentive effects of higher taxes to pay for pensions could lead to a reduction in labour market participation and so to earlier retirement.[39]

What are the likely consequences of ageing for retirement in Britain? Assuming a continuation of the policy of price indexation of the basic pension and following the Social Security Act of 1986 and the decision to equalise state pension ages at 65, tax rates will not rise in the future on demographic grounds. Furthermore, life expectancy is increasing. Given these factors, and the

39. Sheshinski (1978) and Lazear (1986).

continued uncertainty as to the *level* of social security benefits, the motive of maintaining levels of consumption might be expected to dominate, resulting in greater participation, not a continued decline as observed in the previous two decades.

So, if anything, economic theory would predict static or increasing working ages as a result simply of the ageing of the population in the UK. But the increased income levels among pensioners that we noted in Chapter 2 will also have effects on the retirement decision.

The most obvious impact of increased incomes, particularly occupational pensions, is through an income effect. Individuals are less likely to work if their expected pension income is higher. Even this conclusion is not definitely predicted by economic theory, however, because occupational pensions might also give an incentive to work longer (an intertemporal substitution effect), since continued employment increases eventual pension entitlement, when pensions are typically linked to final earnings.

Other determinants of retirement behaviour might include the changing macroeconomic scenario in the 1980s and 1990s. Persistent high levels of unemployment are likely to have reduced participation among more marginal groups in the labour force as finding a job becomes more difficult.[40] This withdrawal from the labour force is likely to have been exacerbated by reforms to the rules governing benefit entitlements and registration as unemployed.[41]

Finally, the close link between ill health and retirement has been well established,[42] but the relationship between the two is complex. Health status will itself be affected by whether or not the person is working. Moreover, access to disability and sickness benefits, which is also linked to labour market status, will affect the ill-health–early-retirement link.[43]

40. Blundell, Ham and Meghir (1992).
41. Atkinson and Micklewright (1989).
42. Piachaud (1986) looks at evidence for Britain.
43. Disney and Webb (1991). Department of Social Security (1993a) reports an increase in the numbers claiming invalidity benefit from 600,000 in 1978–79 to 1.5 million in 1992–93.

PATTERNS OF RETIREMENT ACROSS INDIVIDUALS

Looking at participation rates in isolation tells us little about individual retirement behaviour, in particular what leads to shifts between employment and inactive labour market status for individuals. To find out more about this, we need to look at the actual labour market behaviour of individuals over a period of time. Data to allow this to be done, which give details of the entire working histories of a large sample of individuals, are available for the UK in the 1988–89 Retirement Survey.[44]

Using this 'event history' of periods in and out of employment, the pattern of retirement behaviour can be described.[45] One problem is that if individuals are observed not working in the Retirement Survey, we cannot be certain that they will not find a job in the future — they might not in fact be permanently retired. So retirement should be treated as a 'probabilistic' state. The probability of 'retirement' at a given age is modelled as the product of the probability of leaving employment and the probability of not becoming re-employed once not working.[46]

Looking at probabilities of job loss at any point in time, we find that these are higher among the group without occupational pension rights until people reach their late 50s and early 60s. Then the exit rate becomes higher among those with pension

44. Details of the survey and descriptive statistics of the results are published in Bone, Gregory, Gill and Lader (1992). The survey is a random sample of 2,500 households containing one or more people aged 55–69, giving 3,500 individuals in that age range.
45. See Disney, Meghir and Whitehouse (1993, 1994) and Meghir and Whitehouse (1993) for a complete analysis.
46. A short cut to recovering the probability of retirement is to compute exit rates from employment at each age, conditional on having worked in the previous period, and multiply them by the probability of not becoming re-employed before state pensionable age:
Pr(labour market exit at age A)
= Pr(job ends at A | working at $A-1$) × Pr(duration of unemployment > $65-A$).
This gives the retirement 'hazard' function, by weighting the probability of job exit by the probability that the spell unemployed is in fact 'retirement'. The first right-hand-side term above is the conditional job exit rate. This aggregates over all possible durations of employment and unemployment.

rights. For those in the uncovered sector, job exit before age 65 is likely to stem largely from redundancy or ill health; for those with pension rights, retirement on an occupational pension is also a major factor.

Starting with men, the turnover rate is around 15 per cent per year for men without occupational pensions until age 60, with some decline in the exit rate with age. After age 60, the rate leaps to an average of 20 per cent. Fewer men with occupational pension rights leave jobs until age 55, averaging under 10 per cent a year. After age 55, the rate increases with age and is the same as or larger than for people of the same age without pension rights.

Women show a different pattern. Exit rates for the group without pension rights are stable until the late 50s at around 12 per cent. Turnover for those with pensions declines with age from 12 per cent to less than 10 per cent. Again, after age 60, women with pension rights are more likely to leave their jobs.

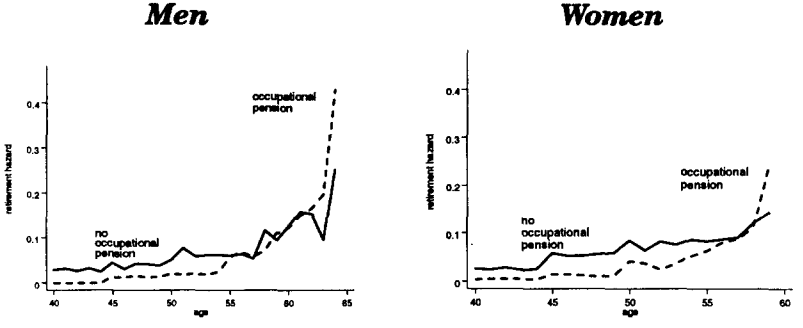
This job exit information and the probability that unemployment lasts until 65 are now combined to generate retirement probabilities. Weighting the job exit rate by the probability that individuals do not find another job, a probability that they have in fact 'retired' can be assigned. The results of this exercise are shown in Figure 3.3. The probability of retirement increases almost monotonically with age for both men and women and in both pension sectors. The retirement hazard is lower among those with occupational pension rights at most age ranges for both men and women.

The retirement rate for men climbs from 5 per cent in their 40s to 10 per cent by age 60 for those without occupational pension rights. In the pension sample, no one retires before 45, and the rate is very low until age 55. Thereafter, it increases rapidly with age, passing the hazard for those without pension rights in the early 60s. For women, the pattern is similar. The retirement rate is close to zero for women in their 40s with pension rights, compared with 3 per cent for those without pension entitlements, rising to 8 per cent at age 50. As with men, the rates move closer together from age 50. Among women in their late 50s, those with pensions are more likely to retire.

A clear inference from these retirement rates is that the structure of pension benefits has an impact, deterring individuals

FIGURE 3.3

Probability of Early Retirement, by Age



Note: Probability of leaving a job in the next year at a particular age and not working again until pensionable age, by sex.
Source: Disney, Meghir and Whitehouse (1994).

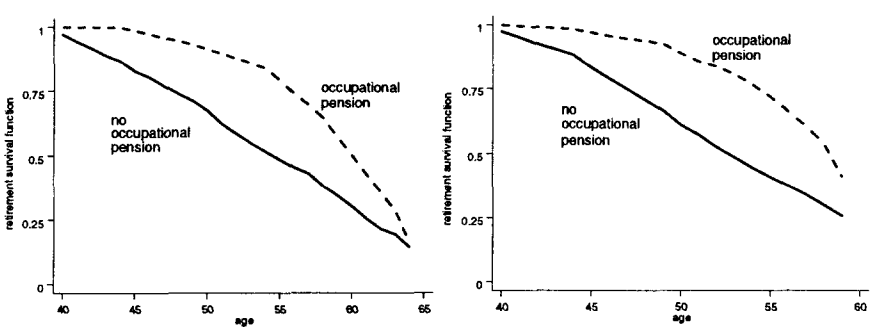
from retiring just prior to the earliest potential receipt of benefits. Once eligible for benefits, the rate of labour market exit is significantly increased.

To summarise the implications of these retirement rates for the actual pattern of retirement, the 'survival' functions implied by the hazards are computed. These are simply the product of all the 'one minus the labour market exit rates', and are plotted in Figure 3.4.

For both men and women, the survival functions for those without occupational pension rights are approximately linear, with the survival function for those with occupational pensions having pronounced concavity to the origin. The labour market experience of the two groups is again shown to be profoundly different. The higher retirement hazards at earlier ages among the occupational pension sample, resulting from both a lower exit rate and a lower probability of never subsequently working, mean that a large gap opens up between the two pension groups. After age 55, the gap begins to close. These survival functions confirm the importance of the incentives provided by occupational pension schemes: the survival probability is considerably higher just before retirement benefits may become due (either 'full' or early retirement), and thereafter the survival probability falls much

FIGURE 3.4

Early Retirement Survival Function



Notes: Probability of continuing to work or of not working but finding a job before pensionable age, by sex.
Proportion surviving at age A

$$= \prod_{t=40}^{A} [1 - \Pr(\text{labour market exit at } t \mid \text{survived to } t-1)].$$

Source: Disney, Meghir and Whitehouse (1994).

more rapidly than that of those not covered by pension schemes. One result is that retirement behaviour is considerably more heterogeneous for those without occupational pensions. Retirement ages cover a larger age range and have a broader distribution.

The pattern of retirement behaviour across individuals and over time has important implications for the pension system. First, pension schemes affect the retirement decision. Second, retirement behaviour is very flexible, and may become more so as people can choose retirement age and date of pension receipt. Despite the institutional structure of a fixed pensionable age in the state scheme and a fixed 'normal' retirement age in occupational schemes, the bunching effect on retirement age is not pronounced. Retirement behaviour is an *economic* decision given the institutional structure, not an institutional decision *per se*.

3.6 Taxing Private Pensions

Finally, in dealing with the principles of pension provision, it should be noted that how the tax system should treat pensions is of central importance, particularly as it is one of the most direct ways in which government can affect the level and type of pension saving without actually legislating to force people in particular directions.[47] The choice of tax regime will affect the incomes of the elderly both now and in the future.

Savings through pension schemes are among the most fiscally privileged forms of savings in Britain, and in most industrialised countries. This alone would imply that they are among the most important forms of private savings, even allowing for the desire to shift consumption across the life cycle. As we have seen, one result is that income from private pensions forms a large and growing part of the incomes of the retired.

We begin by describing general economic principles applicable to all forms of saving, using pensions as an example. We then briefly describe the tax treatment of different savings media in Britain against this bench-mark.

PRINCIPLES OF PRIVATE PENSIONS TAXATION

Private pensions in Britain are funded, so there are three points at which taxation is possible:

- when money is contributed to the fund, formally by employees or employers;
- when investment income accrues to the fund;
- when benefits are paid out to retired scheme members.

In some countries (most notably France), private sector pensions are provided with pay-as-you-go finance. Without a fund, the second point at which taxation may occur is lost.

47. A more detailed analysis of the issues discussed in this section can be found in Dilnot and Johnson (1993a, 1993b).

With funding, there are eight basic possible tax regimes, ranging in generosity from imposing tax at none of these points to imposing it at each of them. We concentrate here on four regimes, ignoring the cases where no tax is levied, where tax is levied at every point, where only investment income is taxed and where only investment income is exempt. These omitted regimes are not found in any industrialised country, nor have they been proposed, nor is this surprising, as we discuss below.

Table 3.2 illustrates the four regimes we consider. It shows the net pension resulting from a contribution of 100 made five years before retirement. For simplicity, we assume a proportional income tax of 25 per cent and a rate of return on investment of 10 per cent a year.

The first regime (A) exempts contributions from tax, does not tax fund income, but does tax benefits in payment. This we refer to as an exempt, exempt, taxable (EET) regime. Regime B involves saving out of taxed income, no tax on fund income and no tax on benefits in payment, i.e. a TEE regime. In this simple model, these two regimes are equivalent in effect. They both confer a post-tax rate of return to saving equal to the pre-tax rate of return. They are neutral between consumption now and consumption in the future. Faced with either regime, an individual earning 100 now can consume now, paying tax of 25 and buying goods worth 75, or

TABLE 3.2

Alternative Pensions Tax Regimes

	Regime A, EET	*Regime B, TEE*	*Regime C, TTE*	*Regime D, ETT*
Contribution	100	100	100	100
Tax	—	25	25	—
Fund	100	75	75	100
Investment return	61.05	45.79	32.67	43.56
Fund at retirement	161.05	120.79	107.67	143.56
Tax on pension	40.26	—	—	35.89
Net pension	120.79	120.79	107.67	107.67

Note: Assumes investment return of 10 per cent earned over five years.

save now, allowing consumption of goods worth 120.79 in five years. But 120.79 is just the amount available for consumption now, 75, increased at a 10 per cent rate of compound interest, i.e. $75 \times (1.1)^5$.

In practice, regimes A and B may not have the same effect because of the point at which tax exemption occurs. If an individual pays a different tax rate on income while in work (when contributing) from the tax rate paid in retirement (when receiving benefit), then pre- and post-tax rates of return will no longer be equalised. The individual will benefit more from relief at the point when a higher marginal tax rate is faced.

By contrast to regimes A and B, those shown under C and D in the table involve taxation at two points. In regime C, savings are made out of taxed income, income earned by the fund is then taxed and benefits received are untaxed (TTE). In regime D, the tax exemption occurs at the point of contribution, while fund income and benefits paid are taxed (ETT).

In this model, their effects are again the same. But the post-tax rate of return is now below the pre-tax rate of return (7.5 per cent rather than 10 per cent, i.e. $107.67 = 75 \times (1.075)^5$). They result in a disincentive to saving, because consumption now is worth more than consumption in the future. The TTE method of taxation (regime C) is used for a number of other savings instruments (such as interest-bearing accounts and direct equity holdings), although there have been moves towards the TEE regime with new instruments such as PEPs and TESSAs.

In general, the EET and TEE regimes are 'expenditure tax' regimes, while the ETT and TTE regimes correspond to 'comprehensive income tax' treatment (though only where there is no inflation; otherwise, only real returns to fund income should be taxed). The reasons for these names are clear. In the first two cases, only consumption or expenditure is taxed and it is taxed at the same rate whether it is undertaken now or in the future. In contrast, the last two regimes tax all accruals to income, whether from earnings or income earned by an investment fund, irrespective of whether they are used for savings or consumption.

The expenditure tax and comprehensive income tax treatments are two ways of interpreting fiscal neutrality with respect to savings. Equalising pre- and post-tax rates of return is

the same as having a tax system that is neutral between present and future consumption. In contrast, the comprehensive income tax is neutral between consumption and savings, treating savings in exactly the same way as any other form of consumption. But savings are not a commodity like any other good or service. They are a means to future consumption and this is particularly obvious where savings for retirement are concerned. The relevant concept is not neutrality between consumption and savings but between consumption now and consumption in the future. This is the form of neutrality achieved by the expenditure tax.[48]

There are further reasons, including ones of equity and administrative simplicity, for thinking that an expenditure tax might offer the best way of taxing pensions. First, in defined benefit schemes (which dominate the funded occupational pension sector in Britain) it is not possible to attach ownership of the fund to particular scheme members. When marginal tax rates vary, it is not possible to attach a tax rate to employer contributions and investment returns. Second, identifying investment returns, especially in the form of unrealised capital gains, can be difficult. Taxing gains on realisation rather than accrual causes different problems. Third, comprehensive income tax treatments have difficulty in dealing with inflation. Taxing investment returns can mean that *nominal* returns are taxed. The post-tax real return will fall even further below the pre-tax real return. If, for example, 7.5 per cent of the 10 per cent interest rate assumed in Table 3.2 reflected inflation, then the TTE and ETT regimes would result in net pensions showing *no* real return: the 7.5 per cent post-tax nominal rate of return is only just enough to compensate for inflation. A higher level of inflation would confer negative post-tax real returns.[49] By contrast, the expenditure tax regimes maintain equal pre- and post-tax real returns whatever the mix of inflation and real returns in nominal interest rates.

48. Kaldor (1955), Carter Commission (1966) and Pechman (1980).
49. Despite the apparent absurdity of this situation, many assets in Britain (such as ordinary interest-bearing deposits) are taxed this way. Negative real post-tax rates of return have occurred in periods of high inflation, which can only be desirable if we think that there is 'too much' private saving.

With 7.5 per cent inflation, their real return is 2.32 per cent per annum which is equal to the pre-tax real return ($1.075 \times 1.0232 = 1.10$).

It is not desirable that the tax system should distort the intertemporal allocation of consumption without sound reason. Comprehensive income tax treatment encourages consumption now at the expense of consumption in the future and even more so in the presence of inflation, whereas an expenditure tax is neutral in both these respects. Further, the comprehensive income tax is administratively difficult to operate when marginal tax rates vary across individuals (without resorting to arbitrariness).

Although the discussion thus far has general application to the taxation of any form of savings, we have concentrated so far on taxing pensions. But there is a second concept of fiscal neutrality with respect to savings decisions: neutrality between different *types* of saving. If one savings medium is taxed more leniently than others, then it will tend to attract funds at their expense. Again, decisions are distorted compared with those made in a tax-free environment. Without a compensating economic gain from these distortions, they result in economic inefficiency. Nevertheless, different forms of saving are treated differently in Britain and in all other countries.

In most cases, saving for retirement is treated particularly favourably. In Britain, there are three main tax regimes for savings apart from pensions. Owner-occupied housing is the most favourably treated, with some deductibility for mortgage interest payments, and no further tax (an E/T,EE regime). New instruments such as TESSAs and PEPs have a TEE treatment, with much of the rest of savings (for example, deposits and equities) being taxed on a comprehensive income basis (TTE) without allowance for inflation. The treatment of pensions is closest to the EET approach. Despite moves towards a more neutral savings system (between savings instruments), few countries have done much to remove the privileges for pensions savings.

A number of arguments have been made to support this relatively generous treatment:

- the state should ensure that people maintain living standards in retirement approaching the level before retirement;
- by encouraging saving for retirement, the exchequer costs of welfare are reduced, particularly when means-tested benefits are an important source of retirement income;
- the state should increase long-term savings (like pension funds) to add to the level and/or stability of capital available for investment.

The first argument for encouraging retirement savings is the paternalist one we discussed in Section 3.1. The state gives incentives to save for retirement (relative both to current and to future pre-retirement consumption) because in the absence of incentives, individuals will fail to make 'sufficient' provision.[50] There are a number of reasons why, first, this rationale may not be valid and, second, why the tax system is not a good way of achieving it.

As described before, it is hard to define 'sufficiency' beyond an adequate minimum. Offering tax incentives for retirement savings need not ensure that everyone achieves that minimum standard — state intervention in a more direct way is necessary.

Other means of ensuring that retirement living standards approach the level during work may be more effective and, perhaps, less distortionary. First, the state could make some level of pension contributions compulsory. Second, the state could directly provide earnings-related pensions with high earnings replacement ratios (as in Italy, until 1992 at least).

The second argument is one of 'moral hazard' — simply that individuals will not save for retirement if they know that the state will provide them with an adequate income anyway. But, again, it does not follow that attaching fiscal privileges to pensions is the most effective method of minimising exchequer welfare costs. Indeed, the personal pensions 'experiment' in Britain has led to a

50. Diamond (1977).

reduction in current revenues far larger than the projected savings from the social security budget in the future.[51]

The effects of tax relief for pension contributions on overall savings levels are difficult to ascertain. There has been a long-running debate about the extent to which tax incentives for a particular form of saving increase overall saving, or merely divert savings from other sources that would have happened anyway. Tax incentives have led to great popularity for the forms of saving to which they apply, for example, the 'success' of personal pensions in Britain and individual retirement accounts (IRAs) in the US.

As far as the overall savings rate is concerned, a new savings incentive can appear to be successful whilst in fact merely changing the composition of savings and possibly even reducing national savings. If people have a fixed demand for income in retirement, new tax incentives for pensions could lead to a reduction in current savings without cutting the level of retirement income. The tax incentive would cost the Government money, reducing public sector saving, whilst private sector savings fall as well.

The empirical evidence is inconclusive. If there is any consensus, it is that incentives to save in pension schemes increase national savings a little.[52] However, other commentators have suggested that contributions to IRAs in the US added to total saving,[53] while yet others cast doubt on the suggestion that even a small increase in savings occurred.[54] Given the inconclusive nature of this work and the different ways of funding pensions, it would not seem wise to suggest that a desire to increase economy-wide saving either is or should be a major objective for pension taxation.

51. National Audit Office (1991), Disney and Whitehouse (1992b) and Section 7.3.
52. Munnell (1986).
53. Venti and Wise (1987) and Feenberg and Skinner (1989).
54. Gravelle (1991).

TAXING PENSIONS IN BRITAIN

We have argued that the most appropriate regime for taxing savings of any form is the expenditure tax (EET or TEE) type and that the taxation of pensions in the UK approximates this regime. This is, however, only an approximate description of the pension tax regime in the UK. Here, we describe in more detail the specific provisions of the UK tax system as it affects pensions.[55]

Contributions to a pension scheme are not taxed, though there are limits to the extent of this relief. Employee contributions are deducted before arriving at taxable income, and employer contributions are not taxed as income of the employee and are allowable as a deductible business expense. For defined contribution schemes, there is a limit to the proportion of earnings that may be contributed, rising from 17.5 per cent for those aged 35 or under to 40 per cent for the over-60s. The pensions cap — originally £60,000 but increased to £75,000 from April 1992 — restricts the level of earnings to which the contribution limits apply.

For defined benefit schemes, employee and employer contributions are deductible. However, there are a number of limits on this deductibility. Employee contributions are deductible only up to 15 per cent of earnings (and an £11,250 ceiling), and tax privileges are available only to pension benefits up to two-thirds of final salary, capped by the earnings limit of £75,000. Although currently this affects only a tiny proportion of pension scheme members, in future its effects will be more widespread if real earnings continue to grow, as current policy is to index the earnings limit only in line with prices (in fact, it was frozen by Finance Act 1993).[56]

55. See Dilnot and Johnson (1993a, 1993b), Hills (1984) and Fry, Hammond and Kay (1985) for a more detailed discussion of taxation in Britain, and Munnell (1991) on the US.
56. Further, the effect of the cap is greater on defined benefit than defined contribution schemes, since final salaries are likely to be larger in real terms than earnings earlier on in life. See Dilnot and Disney (1989).

The investment returns to pension funds are exempt from tax. However, the changes to dividend taxation in Finance Act 1993 mean that pension funds' investment returns bear some tax. From 1994–95, the rate of advance corporation tax (ACT) and the basic rate of tax on dividends will be reduced to 20 per cent. This does not affect the finances of most companies[57] in the medium term, since although they pay a reduced ACT rate, they have a smaller ACT credit to offset against their mainstream corporation tax. However, the lower rate of dividend taxation reduces the tax credit paid to pension funds. The result is a 7 per cent lower return on dividends than under the previous regime. Tax may also be levied on investment returns of pension funds that are in surplus by more than 5 per cent (when assets in the fund exceed pension benefit liabilities).

Finally, pensions in payment are taxable in full. The exception is the option of taking a tax-free lump sum. In the case of defined benefit schemes, this is limited to one-and-a-half times final salary; in defined contribution schemes, it is limited to one-quarter of the accumulated fund.

CONCLUSIONS

The expenditure tax regime is the most appropriate for taxing savings. The treatment of pensions is closest to the EET regime of all the schemes we considered here, and indeed is more appropriate than the treatment of many other forms of saving.[58] The deviations from the expenditure tax approach include the effect of the new rules for dividend taxation and advance corporation tax — which are in effect a tax on the investment returns of pension funds — the ceilings to contributions, and, most significant of all, the tax-free lump sum.

57. The exception is companies with surplus ACT — see Davies, Dilnot, Giles and Walton (1993).
58. See Capital Taxes Group (1994).

Appendix 3.1 Levels of Annuitisation and Replacement Rates

We opened this chapter with a discussion of whether individuals do choose the optimum pension plan. A second concern was whether people make 'sufficient' pension provision. Here, we consider a number of factors which might impinge on the determination of a suitable level of retirement income.

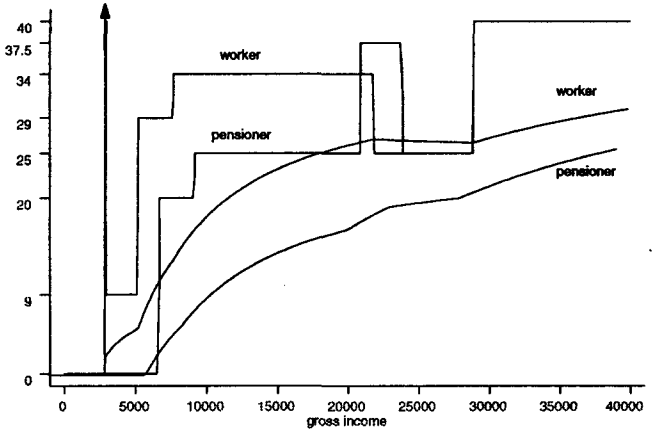
One implication of standard consumption theory is that, conditional on certain assumptions, it is optimal for individuals to save in the form of annuities. In fact, individuals do not store all of their wealth in this form. A number of reasons for this have been suggested, including adverse selection in annuity markets, the desire to bequeath wealth and some precautionary motive for saving. The precautionary motive — saving for a 'rainy day' — might include shocks to expenditure (like the need for long-term care) which are difficult and prohibitively expensive to insure against; see, for example, Laing (1993). In the case of long-term care, market failure arises from the effects of adverse selection in the presence of informational asymmetries.

The pension system encourages individuals to store their wealth as annuities rather than in forms that provide a stock of precautionary savings or bequeathable assets. Individuals may end up being over-annuitised, that is, holding more than the 'optimum' proportion of their wealth in pensions. Here, we make some attempt to investigate the optimum level of savings for retirement, and in particular the impact of institutional factors.

Simple comparisons between gross incomes during work and retirement do not adequately capture differences in living standards. One important difference is in the direct tax system, illustrated below. Figure 3A.1 shows the levels of direct taxation paid by workers (thin lines) and pensioners (bold lines) with the same gross income, giving both marginal (the stepped line) and average (the smooth curve) rates. Starting at the left-hand side and with marginal rates, there are a number of differences between workers and pensioners. First, pensioners are not liable for National Insurance contributions; once workers reach the lower earnings limit, they are liable for 2 per cent of earnings up

FIGURE 3A.1

Marginal and Average Tax Rates on Pensioners and Workers, 1993–94



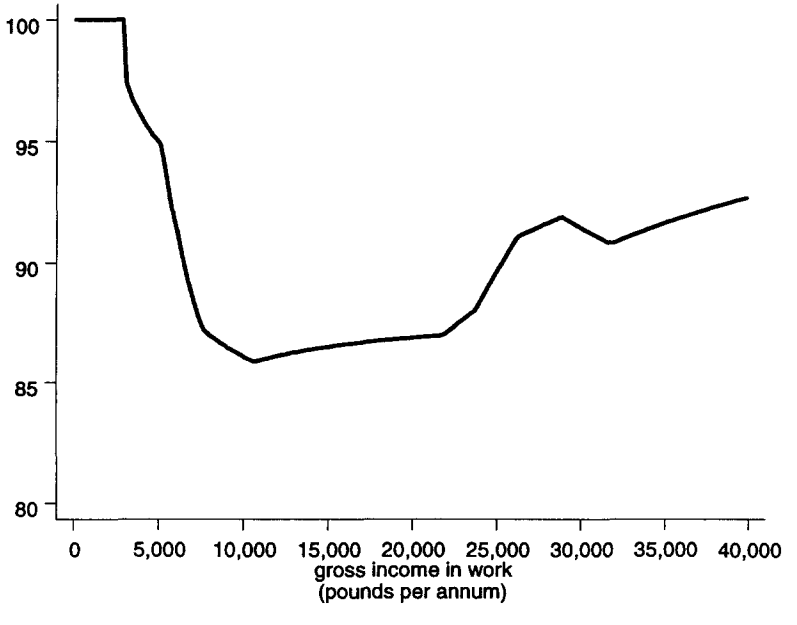
to the limit and 9 per cent thereafter. Beyond the upper earnings limit, no further employees' contributions are levied, and the marginal tax rate therefore falls back. Second, pensioners are given a higher income tax allowance, and so begin paying income tax at the 20 per cent lower rate and 25 per cent basic rate at higher levels of gross income than workers. This extra allowance is withdrawn once a pensioner's income reaches the age allowance 'taper', which results in a 37.5 per cent marginal rate. (This was reduced in the 1989 Budget from a 41.67 per cent marginal rate, after it was pointed out to the then Chancellor, Nigel Lawson, that his assertion that 'all marginal direct tax rates above 40 per cent' had been eliminated was incorrect.) When the age allowance is exhausted, the marginal income tax rates are the same for

workers and pensioners, but National Insurance means that workers pay a higher average rate.

One effect of the lower level of taxation is that pensioners require a lower level of gross income than workers to achieve the same net income across most of the income range. This effect is illustrated in Figure 3A.2. Here, we have computed the level of gross income for a pensioner relative to a worker to achieve the same net income. Over much of the income range, a pensioner needs just 85 per cent of the gross income of a worker to achieve the same net income. Further, this chart ignores a number of other effects. First, there may be costs associated with work (travel, clothing etc.) which are not borne by the retired. Second, the marginal utility of income may change with age. Third, the retired will tend to have accumulated assets such as houses and

FIGURE 3A.2

Replacement Rates and the Effect of the Tax System



Note: Proportion of pre-retirement gross income needed post-retirement to match net income pre-retirement.

consumer durables which increase their effective consumption without increasing spending. These effects may well mean that the gross income required to achieve the same standard of living as a worker is lower still than shown in the figure. Finally, the figure does not take into account the fact that the pensioner may well be in receipt of the basic state pension of around £4,700 a year for a married couple. For example, for an individual with in-work earnings of £10,000, an income from sources other than the basic pension of 35 per cent of prior earnings would achieve the same net income, including receipt of the basic pension, rising to 60 per cent at earnings of £20,000.

We have noted the implications of the different tax treatments of pensioners and workers for the replacement rate necessary to achieve the same net income standard, but it is worth briefly questioning the rationale of this more favourable treatment. Whilst there may be good reasons for redistributing from workers to pensioners, the argument that a pensioner *with the same gross income* as a worker has a lower taxable capacity seems a strange one. Further, the exemption has curious distributional consequences among pensioners. Since the basic pension is substantially below the level of the allowance, a pensioner couple under 75 would require an income of over £37 a week above the basic state pension to benefit in full from the allowance. The existence of the taper means that the best-off pensioners do not gain from the existence of the allowance. It has been argued[59] that the age allowance — a tax relief benefiting the middle band of pensioners relative to poorer pensioners and to workers on the same income, costing £700 million in income tax revenues forgone in 1992–93 — should be abolished.

59. Morris (1981).

CHAPTER 4

How Much Are Supplementary Pensions Worth?

4.1 Introduction

The structure of supplementary provision beyond the basic state minimum — including occupational plans, personal pensions and SERPS — was changed substantially in 1988. In Chapter 2, we showed that new pensions options were introduced and that most workers were offered a choice of plan, and the enormous effect this had on the structure of pension coverage. There has been a shift to defined contribution pensions (such as personal pensions) away from defined benefit formulas (final salary occupational schemes and SERPS), and a substantial degree of 'privatisation' of supplementary pension provision. In this chapter, we consider the extent to which these trends will continue or reverse. In the new regime, the future structure of supplementary pension provision depends foremost on individuals' choice between SERPS, personal pensions and occupational schemes. The costs and benefits of the different options, which in principle underlie these decisions, are examined here.

4.2 Pension Benefits

Supplementary pension benefits consist of two components. The first part is compulsory: either the individual must choose to join SERPS or pay the guaranteed minimum contribution (GMC) into a pension account, or the employer must agree to pay the guaranteed minimum pension (GMP). Beyond that, individuals

or their employers may choose to make extra contributions or, in final salary schemes, to offer a pension greater than the GMP. We begin by looking at the compulsory part — SERPS, the GMP and the GMC — before looking at the extra benefits from occupational and personal pensions.

Pension benefits can be divided into two broad types: defined contribution and defined benefit. In a defined benefit plan, the pension is determined by a formula taking account of years of scheme membership and pay. In a defined contribution scheme, each individual has an account in which contributions and investment returns accumulate. However, the difference, in practice, is not always so clear cut: defined benefit pensions in Britain have defined contribution aspects, and vice versa.

Defined contribution plans are conceptually simple. The focus is on the *stock* of accumulated assets in the pension account, which is converted to an annuity on retirement. Defined benefit schemes, in contrast, concentrate on the *flow* of benefits received in retirement. To compare like with like, we convert the value of the stream of final salary occupational scheme and SERPS benefits into a single number representing the 'stock' of pension entitlement: the present value of the stream of pension payments, discounted back to retirement age, since money received tomorrow is less valuable than money received today. This transformation involves multiplying the pension by an annuity 'factor', which will depend on the rate of return, post-retirement indexation arrangements (in the presence of inflation, an indexed pension is more valuable) and the provisions made for surviving dependants.[1] This factor is the inverse of the annuity 'rate', the relationship between the stock of assets built up in a defined

1. A simple annuity formula in discrete time, indexed t, is $A_R = \sum_{t=R}^{\infty} S(t)\,(1+r)^{(t-R)}\,p_R$, where p is the value of the pension benefit paid from retirement, R, until death. The date of death is unknown in an *ex-ante* valuation; the 'survival function', $S(t)$, gives the probability that an individual is still alive t years after retirement. The pension value reflects the age-weighted probability that the individual is still alive at any date.

contribution pension account and the value of the pension annuity that can be bought with those assets. Say the annuity rate is 5 per cent; then £10,000 will buy a pension worth £500 a year. The annuity factor is therefore 20 — a pension of £500 a year is worth a lump sum of £10,000.

SERPS AND THE GMP

The complex relationship between earnings across the working life and SERPS entitlements built up is detailed in Appendix 4.1. SERPS gives a pension related to earnings averaged across the working life, uprated to retirement in line with economy-wide average earnings. Pay outside the National Insurance earnings limits is not covered. SERPS is less generous to later date-of-birth cohorts: those retiring before the turn of the century will receive three times as large a benefit for each year of contributions as those currently aged under 32.

In fact, most employees are contracted out of SERPS. Individuals may contract out of SERPS into a defined benefit scheme,[2] so long as the scheme pays them a pension at least as large as the guaranteed minimum pension. Confusingly, the formula for the GMP is similar to, but not the same as, that for SERPS, as explained in Appendix 4.2. The SERPS/GMP rules have the rather quirky result that only in exceptional circumstances will people who contract out of SERPS fail to receive a SERPS pension, since the GMP will nearly always be less than SERPS. The value to the individual of contracting out (particularly relative to contracting in) must include some allowance for this extra payment from the state. If a defined benefit occupational pension scheme fails, then the GMP is paid for by the Government. Insurance against the Government

2. Some employer-provided defined contribution plans also contract out by agreeing to pay the GMP rather than contribute the GMC. The scheme must then ensure that it retains sufficient funds to meet the GMP liability, as with a defined benefit plan.

having to meet these benefits is provided by requiring contracted-out schemes to maintain sufficient funds to meet GMP liabilities.

Individuals contracting out into defined contribution schemes do not receive a guaranteed minimum pension from the fund, but will, of course, receive an annuity bought with the proceeds of the guaranteed minimum contribution and associated investment returns. *Both* SERPS and GMPs that are calculated are therefore notional. Again, the Government pays the individual the difference between SERPS and the (notional) GMP.

The fact that the GMP is less than SERPS and that it is only partially indexed does not adversely affect those contracted out relative to members of SERPS. The Government pays all those who have contracted out the difference between the GMP and a 'notional' SERPS entitlement calculated assuming the individual was contracted in. Thus, even individuals who have been contracted out in *every* year since 1978–79 will still receive a SERPS pension on retirement; see Appendix 4.2. Since the SERPS entitlement is fully indexed, the Government pays for indexation of the GMP beyond the 3 per cent limit. Thus, if inflation exceeds 3 per cent, the SERPS paid by the Government will grow faster than the GMP, and, indeed, will grow faster than prices.

DEFINED BENEFIT OCCUPATIONAL PENSIONS

Most contracted-out occupational schemes pay a pension larger than the statutory guaranteed minimum pension, financed by contributions formally from employers and usually employees. Valuing these rights is more complex than for the other supplementary pensions in Britain because rules vary between schemes and many benefits are subject to discretion.

There has been an extensive discussion of the appropriate method of economic valuation of pension entitlements, mainly in North America.[3] At first sight, valuing defined benefit pensions

3. See Disney and Whitehouse (1994a), on which this section draws. In addition to the references cited below, Barnow and Ehrenberg (1979), Gustman and Steinmeier (1989) and Pesando and Gunderson (1991)

seems a simple technical or actuarial issue. But the *economic* valuation of pension rights is not the same as the methods used by a firm and its actuary to determine contribution rates. These calculations will be based on aggregated figures for future liabilities, not individual pension values, and will be determined by the accounting, legal and tax environment. Over the life of the scheme, the *aggregate* economic and actuarial valuations of costs and benefits must *ex post*, of course, be equal, but will give very different answers for individual pension accruals.

In the US literature, one extreme position is the *legal contract* approach.[4] Since employers have no explicit contractual obligation to employ a worker beyond a notice period, their book valuations of these pension liabilities should be based on the premiss that the worker will not continue membership of the scheme beyond the legal notice period. In this case, there is no contingent pension claim, conditional on future outcomes of employment and earnings, or pension 'option value', and so pension valuation is related closely to current pay.

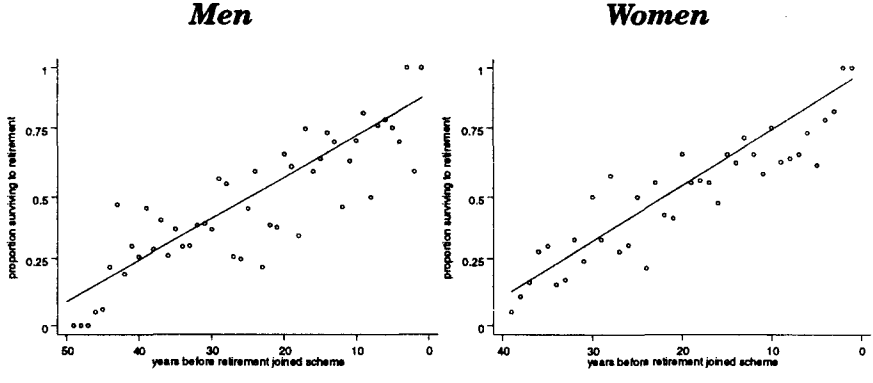
The polar opposite case argues that employment contracts are implicitly forward-looking to retirement. Such a framework could be based on incentive arguments for back-loading pay, including preventing shirking and reducing job turnover from sub-optimally high levels.[5] If job quits and scheme terminations are unlikely, then the *implicit lifetime contract* will value entitlements on the salary at normal retirement date (assuming a final salary defined benefit scheme) rather than current pay.[6] Proponents of this method cite low levels of terminations prior to retirement as the rationale. However, Figure 4.1 shows considerable evidence of attrition prior to retirement. Using the 1988–89 Retirement Survey data on pension scheme entry ages and tenures, it plots the proportion who enter a scheme at a

address some of these issues.

4. Bulow (1982).
5. Lazear (1979, 1981, 1985). These arguments are discussed in detail in Section 3.4.
6. Kotlikoff and Wise (1985, 1987) and Ippolito (1985).

FIGURE 4.1

Probability of Surviving in Pension Scheme to Retirement, by Sex and Number of Years Before Retirement Entered Scheme



Note: Line best fitted to data shown for ease of interpretation.
Source: Authors' calculations using Retirement Survey data.

particular age surviving in that scheme until retirement, this time defined as the last time they were observed working.

The first case ignores employment continuing beyond the legal contract and the second infers few exits before normal retirement age. A logical third method, between the two, is to model exits from the scheme explicitly. The result is a set of probabilities of remaining a scheme member to each future date, and then leaving the scheme. The polar cases are equivalent to assuming certain departure next period or certain survival to retirement. In this approach, each extra year in the pension scheme results in a revised set of conditional probabilities of staying in the scheme.[7]

In the next section, we value pension benefits for an example individual under the three contract models. In each model we consider three valuations: *accrued* pension at a given scheme tenure, *marginal* pension (the growth in the accrued pension

7. Disney and Whitehouse (1994a).

between one period and the next) and *projected* pension benefits at retirement.

A typical defined benefit pension formula uses salary in the final year as its base, or averages over the last few years,[8] and may exclude additional remuneration, such as bonuses or commissions, usually because of their high variance relative to basic pay. Roughly half of private sector schemes then 'integrate' benefits with the state pension, that is, they reduce the occupational pension to take account of the benefits pensioners are assumed to receive from the state.[9] The result is then multiplied by the number of years membership of the scheme and a pension fraction. In more than three-quarters of private sector schemes, members receive $^1/_{60}$th of final salary (net of any integration) for each year in the scheme. Over 90 per cent of public sector members receive $^1/_{80}$th of final salary for each year, although this understates the generosity of public sector pensions relative to private, since a pension lump sum is available *on top of* rather than instead of the pension stream.[10]

DEFINED CONTRIBUTION SCHEMES AND PERSONAL PENSIONS

Valuing defined contribution schemes, such as personal pensions, is a good deal simpler than valuing defined benefit schemes, like final salary occupational pensions and SERPS. Defined contribution pensions are simply individual savings accounts. The accrued pension at any point during the working life is the sum

8. The averaging provisions vary substantially. In the public sector, two-thirds of members are in schemes using average earnings over the past year. In the private sector, 20 per cent of members are in schemes using average earnings in the best three of the last 10 years (National Association of Pension Funds (1994) and Government Actuary (1991)).
9. Around a quarter deduct the basic pension from final benefits, others the LEL from the earnings measure. Around a fifth deduct a multiple of more than one times the LEL or basic pension. Note that these methods have similar effects, since the basic state pension is set by statute approximately equal to the LEL. (National Association of Pension Funds (1994).)
10. Pension Law Review Committee (1993).

of contributions made in each period, plus the investment return that will be earned between making the contribution and reaching retirement age.

The pension value in this case is a lump sum on retirement. Individuals then convert the pension benefit to a stream of pension payments by buying an annuity. This is the reverse of the process in valuing defined benefit pensions, which converted the stream of benefits into a single number, the discounted present value.

This simple calculation is complicated by the guaranteed minimum contribution condition for contracting out. The part of the fund derived from the GMC is known as the 'protected rights' pension. This must be used to buy a limited price indexed annuity on reaching state pension age. The value of the GMC is shown in Appendix 4.3. The pensions arising from contributions on top of the GMC are a good deal more flexible. The accruing pension fund can be used to convert the pension to an annuity at any age between 50 and 75, and the individual has choice over indexation procedures and guaranteed minimum payments from the annuity.

CONTRACTED-OUT REBATE

An important variable in determining the value of contracting out into a personal pension is the rebate of National Insurance contributions paid in return for forgoing the GMP component of SERPS. The rebate also affects occupational pension schemes: it is the minimum payable into a contracted-out defined contribution plan and the refund given to employees and employers contracted out into an occupational scheme.

The value of the rebate is set by the Secretary of State for Social Security at five-year intervals on the advice of the Government Actuary. The method by which the Government Actuary reaches his decision is technically intricate, as discussed in Section 7.3. The rebate was originally designed to compensate occupational schemes for the cost of providing the GMP. As the value of the GMP to different cohorts changes, so does the value of the contracted-out rebate, as shown in Table 4.1.

TABLE 4.1

Past and Forecast Levels of Contracted-Out Rebate

Per cent

	Contracted-out rebate[a,b]	*'Incentive' rebate*[a,c]
1978–79	7.0	
1983–84	6.25	
1988–89	5.8	2.0
1993–94	4.8	1.0 (over age 30)
1998–99	4.3	
2003–04	3.9	
2008–09	3.6	
2013–14	3.5	
2018–19	3.4	

[a] The Government has announced its intention to introduce age-related rebates from 1996–97 onwards, but has not yet announced what form these will take — see Section 7.3.
[b] The rebate is divided between employees and employers. The division for 1988–89 to 1992–93 was 2.0 and 3.8 per cent respectively. The division now is 1.8 and 3 per cent.
[c] 'Incentive' rebate introduced in 1989–90 for those newly contracting out into personal pensions or defined contribution occupational schemes, and reduced to 1 per cent for over-30s from 1993–94.
Source: Government Actuary (1990).

4.3 Individual Pension Choice

The previous section showed how the pension benefits individuals can expect from membership of different pension schemes are determined. We looked at both compulsory benefits — SERPS, the GMP and the protected rights personal pension — and extra provision in occupational and personal pensions above the compulsory level. This section calculates these pension values for an example individual, to investigate the parameters affecting pension choice. We look first at the choice between SERPS and a personal pension, and then at the valuation of final salary occupational pensions at any point during the individual's working life.

PERSONAL PENSIONS VS. SERPS

Just under half of employees are members of their employer's occupational pension scheme. Excluding those earning below the lower earnings limit or paying the married women's reduced contribution leaves around one-third of employees facing a choice between SERPS and personal pensions. The trade-offs implicit in this choice of pension arrangement are addressed first.

Opting for a personal pension need not involve any *current* cost to the contracting-out individual. The minimum he or she must pay into the scheme is the rebate of National Insurance contributions. National Insurance continues to be deducted at source in the usual way and the rebate, together with the appropriate income tax relief, is transferred after the end of the financial year to the firm operating the pension plan chosen by the individual. Moreover, the tax reliefs for pensions saving are open to individuals contracted into SERPS through free-standing additional voluntary contribution (FSAVC) contracts. The decision whether to contract out of SERPS and take the personal pension option is therefore a simple choice over the use of the contracted-out rebate.[11]

The personal pension versus SERPS choice depends critically on an assessment of the relative benefits offered by each plan. Furthermore, people can choose to contract out of SERPS in each fiscal year, and there is nothing to stop an individual contracting back into SERPS later. The choice, then, is not over the lifetime pension return as summarised above, but over the *marginal* pension earned from spending another year in the scheme.

The parameters of the pension choice are most simply illustrated by computing benefits for an example individual. The values of two variables in the benefit formulas — future earnings growth in the economy and the real return — have to be arrived at by assumption, which we discuss below. A further uncertain component — the path of individual earnings across the life cycle — is simulated. A series of Family Expenditure Survey data sets

11. Disney and Whitehouse (1992b).

for 1978–86, covering some 67,000 individuals, were analysed to investigate how individual earnings change over the life cycle, and how they vary between the sexes and between different occupations and industries. The estimated relationships were then used to simulate how earnings of current workers will develop in the future.[12]

The example chosen to illustrate pension values is a man working in a white-collar job, born in 1968 and so aged 20 in 1988 when personal pensions were introduced. His earnings at age 20 were £192 per week (in 1990 prices, as with the whole of this analysis). The key results with respect to pension choice were found to be sensitive mainly to age (the effect of which is captured in the results) and sex, whilst other variables, such as earnings, were not significant.[13] Transactions costs, principally the charges levied by pension providers, are ignored for the moment, an assumption that is favourable to personal pensions. We discuss the concern over personal pension charges in Section 5.4.

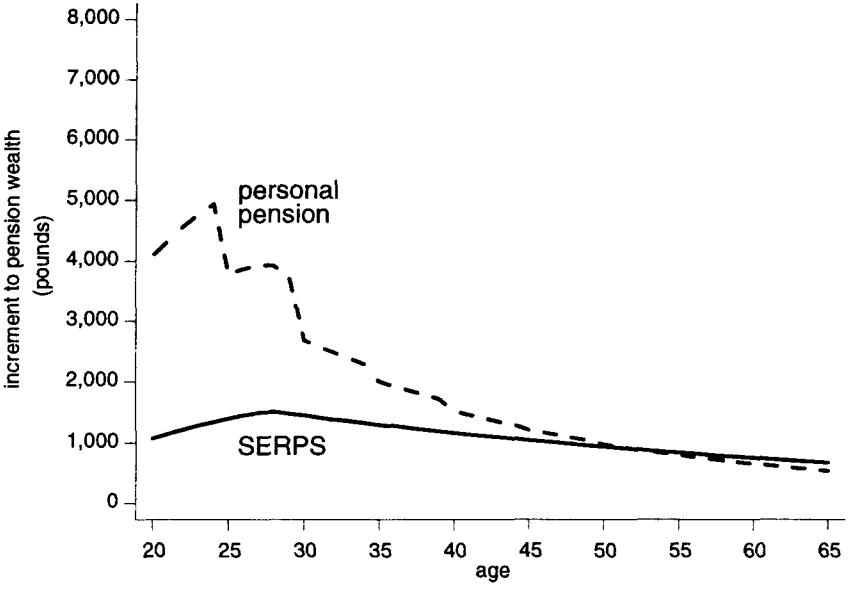
Each of the figures below shows the marginal pension benefit in 1990 prices: the value of additional personal pension contributions and associated investment returns, and the extra SERPS entitlement converted to a lump sum using an annuity factor. Figure 4.2 shows the general form of the comparison, assuming a real interest rate of 4 per cent and earnings growth of 2 per cent. We test for sensitivity of the results to different assumptions below.

What does Figure 4.2 tell us? First, increments to personal pensions (PP) are greater early on in the working life, despite the fact that earnings are higher in later years. This weighting occurs for two reasons. First, there is the compound interest effect: contributions in early years yield a far larger investment return than contributions close to retirement. Second, the declining value of the rebate for contracting out as SERPS matures (Table 4.1) means that the Government will make a smaller contribution

12. Results are reported in Disney and Whitehouse (1994a, 1994b), and methods are discussed in Disney and Whitehouse (1991a) and Meghir and Whitehouse (1992).
13. Disney and Whitehouse (1992b) report more detailed sensitivity analysis.

FIGURE 4.2

Marginal Increment to Total SERPS and Personal Pension, by Age



Note: Excludes transactions costs (such as pension fund charges). The sensitivity of the results to these costs is discussed in Section 5.4.
Source: Disney and Whitehouse (1993c).

to the personal pension in the future. The steep rise in pension accrual in the first few years of working life reflects the large returns to working experience for men in white-collar jobs. The quinquennial review of the rebate is responsible for the discontinuities in the curve where there are discrete changes in the rebate.

The SERPS curve has a relatively flat, continuous profile over time. The smoothness results from the way in which we model earnings growth over the life cycle. Despite the growth of earnings over the individual's lifetime, the curve is horizontal, for two reasons. First, the revaluation of SERPS benefits in line with economy-wide average earnings gives greater weight to earlier

years than, for example, uprating in line with prices.[14] Since we have assumed investment returns exceed real earnings growth, the front-loading effect is smaller than for personal pensions. Second, the cap to eligible earnings from the upper earnings limit (to both SERPS and the rebate) generates a kink in the SERPS curve. Here, this occurs at age 28, because of the assumptions we have made, particularly in modelling the individual's earnings path. Again, this results in a flat profile for this example in later years, as increments to earnings above the UEL are not reflected in a faster accumulation of SERPS.

Figure 4.2 illustrates optimum pension choice across the life cycle for our individual example of a 20-year-old man in a white-collar job. He would receive a much larger pension if he contracted out of SERPS when the option became available at age 20. Indeed, the value of the rebate given in that year (£4,000 at state pensionable age) is some four times larger than the value of the stream of SERPS benefits that would have been earned. Over time, the gap between the two closes, as the contracted-out rebate falls and the compounding effect abates. After age 50, the personal pension curve of marginal benefits lies below the SERPS curve. The individual would improve his overall pension by contracting back into SERPS. On the set of assumptions here, our example white-collar worker would receive a pension stream worth around £50,000 from SERPS. By contracting out into a personal pension, and contracting back into SERPS at this optimum age, the total pension value from the two sources is nearly £90,000 (see Table 4.2 which is discussed below). The annual pension stream would be £9,000 from the optimum switching strategy compared with £5,000 from SERPS. This well-known result — that optimum pension strategy between personal pensions and SERPS involves switching between schemes — shows why it is necessary to consider marginal annual increments to pension.

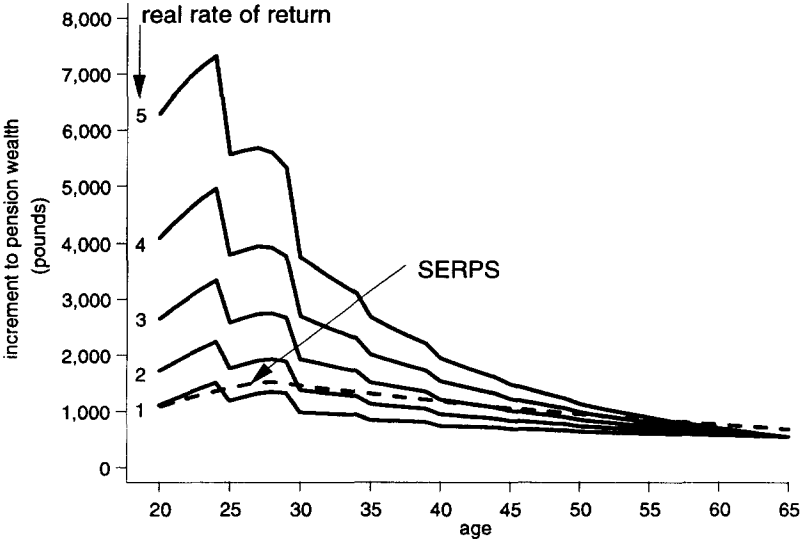
14. Disney and Whitehouse (1991b).

PERSONAL PENSION VS. SERPS: SENSITIVITY ANALYSIS

The calculations behind Figure 4.2 depend on assumptions about the future value of economic variables. We now examine the sensitivity of the results to these assumptions. Figure 4.3 holds the assumption of real earnings growth constant at 2 per cent, but varies the assumed real return between 1 and 5 per cent. Shifting to a lower return rotates the marginal personal pension curve downwards and anti-clockwise, and reduces the pension earned at a younger age by more as a result of compound interest. Although the qualitative result that joining a personal pension when young and switching to SERPS when older remains, the effect of varying the rate of return assumption alters the optimum age for contracting back in substantially. A 5 per cent return would delay re-contracting in to age 55. A 1 per cent real return would

FIGURE 4.3

Marginal Increment to Total SERPS and Personal Pension, by Age and Real Rate of Return



Source: Disney and Whitehouse (1993c).

bring the optimum point forward to age 25; indeed, at that level it is scarcely worth contracting out at all.

The rate of return also affects the value of the SERPS entitlement through the effect on the annuity factor. At lower interest rates, buying an annuity is more expensive. Thus, the guaranteed stream of SERPS benefits is more valuable. We have not taken account of this in Figure 4.3, to avoid drawing still further lines. The effect is to reinforce still further the differences in pension values outlined above, but the SERPS curve does not shift enormously with the rate of return.

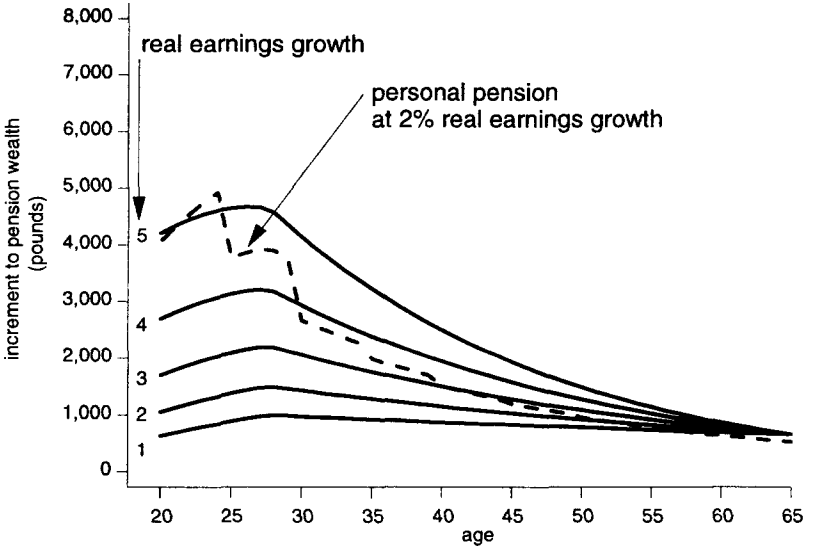
What bounds can we suggest for the real rate of return? Some would argue that the real return should be positive. For example, Social Security Pensions Act 1975 precludes the Government Actuary from assuming a negative rate of return in his or her projections. However, there is no economic argument why the rate of return on physical and financial assets should not be negative[15] — savings and investment will still take place if real returns fall below zero. With little theoretical guidance, recent experience is probably the only indication. We consider the evidence below.

A second source of uncertainty is the rate of economy-wide real earnings growth. An individual's relevant earnings for the purposes of SERPS in a given year are uprated in line with an index of average earnings until state pension age; future growth of average earnings therefore affects the value of accrued SERPS entitlements.[16] Figure 4.4 holds the assumption of the real return constant at the 4 per cent assumed in Figure 4.2, and varies the growth of earnings between 1 and 5 per cent a year. Again, a compounding effect rotates the curves rather than shifting them parallel to the baseline assumption. At very high rates of earnings growth in the economy, it is not worth contracting out, whilst low rates of general earnings growth delay the optimum point of re-contracting in.

15. Hemming and Kay (1981a).
16. Note that we have ignored here any effect from varying the growth in economy-wide earnings from the time-path of this individual's earnings. This would result in similar, though not equi-proportionate, shifts in the value of both SERPS entitlements and the contracted-out rebate.

FIGURE 4.4

Marginal Increment to Total SERPS and Personal Pension, by Age and Real Earnings Growth



Source: Disney and Whitehouse (1993c).

Economic theory suggests a number of mechanisms which drive real earnings growth, such as productivity growth, population shifts and technical change. However, again, there can be no clear-cut expectations of future growth rates.

The results of the analysis are drawn together in Table 4.2. In each cell, three pension returns are given for a set of assumptions. The top line shows the present value in 1990 prices discounted back to retirement of the stream of benefits earned if the individual remained in SERPS. The bottom of each triplet is the value of the fund that would have accrued from investing the contracted-out rebate in each year in a personal pension. The middle figure, in bold, is the pension from following an optimal strategy. Each cell represents a different combination of outcomes for the real return and the real rate of earnings growth. In cells to the right of the line across the table (that is, when the rate of earnings growth exceeds the net return), a SERPS-only strategy

TABLE 4.2

Total Pension Value, by Rate of Return and Earnings Growth, for SERPS Only, Personal Pension Only and Optimal Switching

Thousand pounds, 1991 prices

Rate of return		Earnings growth				
		1%	*2%*	*3%*	*4%*	*5%*
1%	SERPS	48.9	63.8	83.8	110.9	147.9
	Switching	**50.6**	**63.8**	**83.8**	**110.9**	**147.9**
	PP	37.7	37.7	37.7	37.7	37.7
2%	SERPS	44.8	58.4	76.7	101.6	135.5
	Switching	**54.6**	**61.8**	**76.7**	**101.6**	**135.5**
	PP	49.5	49.5	49.5	49.5	49.5
3%	SERPS	41.3	53.8	70.7	93.6	124.8
	Switching	**67.4**	**69.6**	**77.1**	**93.6**	**124.8**
	PP	65.6	65.6	65.6	65.6	65.6
4%	SERPS	38.2	49.8	65.4	86.6	115.4
	Switching	**88.6**	**89.0**	**90.7**	**98.1**	**115.4**
	PP	87.9	87.9	87.9	87.9	87.9
5%	SERPS	35.6	46.3	60.8	80.4	107.3
	Switching	**119.4**	**119.5**	**119.7**	**120.7**	**127.2**
	PP	119.2	119.2	119.2	119.2	119.2

Note: Again, excludes transactions costs, which do not affect the qualitative results. See Section 5.4 for a discussion of charges.
Source: Disney and Whitehouse (1993c).

produces the optimum pension. In all the other cases, a switching strategy dominates: taking out a personal pension and later reverting to SERPS. However, when the real return exceeds earnings growth by a large amount, reverting to SERPS brings little additional benefit. Thus, drawing together the results, a clear pattern prevails. On current policies, individuals improve

their pension by contracting out when young and then contracting back into SERPS at a later date, on all but the most extreme assumptions. The key parameter affecting this choice is the *relative* rates of earnings growth and investment returns. A higher return means that a personal pension is more attractive; higher earnings growth gives SERPS the edge.

As noted above, economics gives little guide as to the future value of either the rate of return or earnings growth. These two are likely to be positively related. Earnings growth is driven by productivity growth, which is also the engine of output growth. This is strongly related to the real rate of return. Thus, we might expect, *ceteris paribus*, that higher returns will be accompanied by higher earnings growth.

In practice, real earnings and the real return in particular vary enormously from year to year. Since pensions are a long-term contract, fluctuations in individual years are less important than the relationship between these two variables over a longer period. Using 20 years as the unit of analysis, and looking at periods ending in 1972 through to 1990, the average real return measured at market values relative to earnings growth has varied between −1 and 8.1 per cent a year, although during the past decade more stable returns of between 1 and 5.5 per cent a year have been observed. Even with a 1 per cent excess over earnings growth, Table 4.2 suggests that a personal pension dominates in a number of years, and the average over the 20-year period was over 3 per cent a year.[17]

Thus, the relative attractiveness of personal pensions and SERPS depends on the relationship between the rate of return and earnings growth. Over long time periods, the return has dominated by sufficient to ensure that personal pensions dominate the return to remaining in SERPS for a large portion of the working life, given the current level of the contracted-out rebate.

17. Government Actuary (1992). See also Wilkie (1981) and Daykin (1976, 1987) for a further discussion of long-term rates of return and the appropriate method of measurement.

VALUING OCCUPATIONAL PENSIONS

Occupational pensions are more difficult to value than personal pensions or SERPS for two main reasons. First, the pension benefit formula varies between pension plans. Second, the pension value depends on the realisation of two interlinked, uncertain variables: earnings and pension scheme tenure. The increments to pensions in an occupational plan are dependent on past behaviour (when the scheme was joined), unlike the analysis of personal pensions and SERPS above.

Heterogeneity of plan formulas can be controlled for, by using micro-data on scheme rules from a selection of pension plans. The data we use comprise the 4,700 individual employees from the General Household Survey (GHS) of 1987 who reported themselves to be members of their employer's pension plan. This sample of members formed the frame for a survey of occupational pension schemes, carried out by the Government Actuary.[18] Taking out those who incorrectly thought they were scheme members, and workers whose employers could not be traced, the sample was reduced to around 4,000, which yielded 3,000 usable responses.

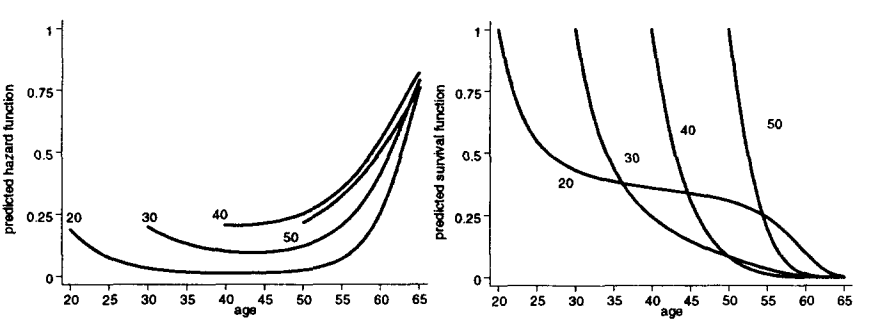
Lifetime earnings profiles were again modelled using a time series of cross-section FES data sets with profiles simulated in the GHS data. We described in Section 4.2 three possible assumptions about earnings and job tenure that can be used to value entitlements. The *legal contract* approach simply uses current earnings and accumulated scheme membership. No external simulations are necessary. The *implicit lifetime contract* approach assumes scheme membership continues to retirement, requiring earnings to be simulated for the final years as specified in the benefit formula. However, the *expected job tenure* approach requires explicit simulation of the probability of future job tenures.

A fourth data set — the 1988–89 Retirement Survey — was used to model duration of pension scheme membership.[19] Full

18. Government Actuary (1991) gives more details about sampling, the survey questionnaire and descriptive statistics of the results.

FIGURE 4.5

Hazard and Survival Functions for Pension Scheme Tenure, by Age at Entry



Source: Disney and Whitehouse (1994a).

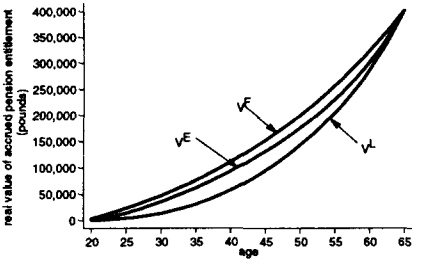
lifetime labour market histories, including job tenure and whether a job was covered by a pension scheme, are available in the survey. The results give estimates of the probability of leaving a job, conditional on sex, age and individual characteristics such as education and occupation as well as how long the individual has been in the job already. Figure 4.5 gives a flavour of the results. The left-hand panel plots the probability that a white-collar worker who joined a pension scheme at age 20, 30, 40 or 50 leaves the pension scheme at a certain age, conditional on having remained in the scheme to that age. This is the so-called 'hazard' function. The 'survival' function — the probability of remaining a member of a scheme until a particular age — derived from these estimates is shown in the second panel of the figure. Each function is plotted at 10-year discrete intervals of starting

19. Using the pension tenures of the Retirement Survey sample born 1919–33 to forecast tenure for current workers may be biased by cohort- or time-specific shifts in turnover. However, the availability of 95 per cent completed tenures in the Retirement Survey offers a substantial advantage over uncompleted duration data in sources such as the GHS.

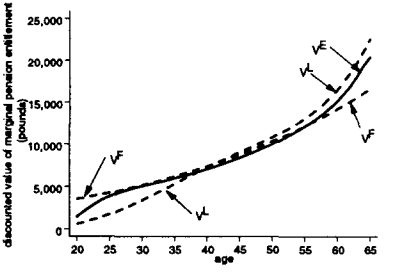
FIGURE 4.6

Alternative Measures of Pension Valuation: White-Collar Worker Joining Scheme at Age 20

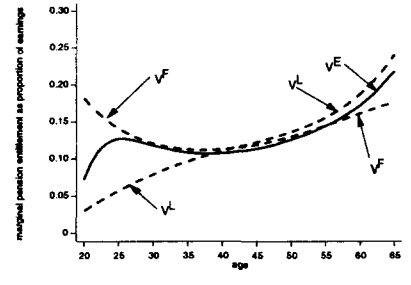
(a) Accrued Pension



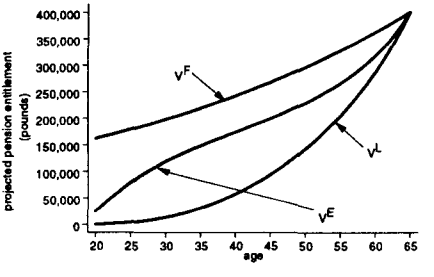
(b) Marginal Pension



(c) Marginal Pension Replacement Rate



(d) Projected Pension



Source: Disney and Whitehouse (1994a).

the new job. The U shape of the hazard shows a higher propensity to leave a job soon after joining, particularly when young, which falls and then rises as individuals near scheme retirement age.[20]

We now implement the alternative measures of occupational pension value under the three different contractual assumptions described above for the example of a white-collar worker joining

20. Meghir and Whitehouse (1993) and Disney, Meghir and Whitehouse (1993).

a scheme at age 20, that is, the same type of worker as the one considered in the personal pension vs. SERPS case. The results are shown in Figure 4.6. In each panel, L refers to the legal contract method, F to the implicit lifetime contract or final salary approach, and E to the expected job tenure measure; for ease of interpretation, the E measure is shown as a solid line on the marginal pension charts and the others as dashed lines. An interest rate of 2 per cent is used to discount benefits from retirement, assumed to be at the scheme's normal age of 60, to each point during the working life. Beginning with the accrued pension chart (Figure 4.6(a)), at each point in the working life, V^L is the lowest valuation because the worker does not envisage the job surviving beyond the notice period and V^F is the highest since expected final pay is used in the formula. The largest discrepancy between the polar measures is around age 45. Accrued benefits at that age are £100,000 in the V^L case and £155,000 using the V^F approach. The V^E valuation lies between the two extremes at £140,000.

The more pronounced bow shape of the V^L curve shows that the degree of 'back-loading' of pensions is most pronounced if we value just the explicitly accrued benefits. This is most apparent in Figure 4.6(b), which plots the marginal increment to pension under each method. Under the V^F method, this is simply a discounted (constant) function of final salary, and so the curve is approximately linear. In contrast, V^L is highly back-loaded: each extra year's tenure not only adds a year of service to pension entitlement, but revalues all previous years' pension entitlements in line with increased earnings and is a year closer to retirement. Unlike the other two measures, the V^E curve is highly non-linear. There is a very high probability of leaving the scheme when young (Figure 4.5); each extra year of tenure considerably enhances the probability of a long scheme tenure. In the middle years, the prospect of leaving the scheme is small (the flat section of the survival curve), so the pension increments more slowly. The marginal accrual then rises again. This results from discounting, since the rate of earnings growth slows when older.

In Figure 4.6(c), we plot these marginal increments as a percentage of contemporaneous earnings, giving a similar pattern to Figure 4.6(b). Again, over most of the age range, the three

measures show a very different level of pension accrual. Finally, projected benefits at retirement are given in Figure 4.6(d). This chart, of course, shows the largest discrepancies. The V^F curve is approximately linear, since the projected benefit depends on the number of years of service at retirement and earnings at retirement, both of which are constant *ex ante*; the slope arises purely from discounting. V^L here is simply the accrued entitlement, as in Figure 4.6(a). The intermediate method, V^E, is again very non-linear, reflecting the U-shaped hazard in Figure 4.5. As the hazards fall and the survival curve flattens out, the V^E curve moves closer to V^F.[21]

CONCLUSIONS

Pension scheme tenure is therefore an extremely important variable in valuing pension accruals. The completed pension scheme tenures in the Retirement Survey average around 10 years, and are somewhat higher for men (11.8 years) than for women (8.5 years). Early membership of an occupational plan is important if the individual expects to survive in the pension scheme until retirement. Otherwise, membership of SERPS or a personal pension may be better for younger, more mobile workers when account is taken of the cost of joining the occupational scheme. But the parameters of the more complex, three-way choice between personal pensions, SERPS and occupational pensions are more variable, and the results less predictable, than the simpler two-way personal pensions versus SERPS choice.[22]

21. Disney and Whitehouse (1994a) provide a cross-check of the valuation method used here, by comparing aggregate values of entitlements and average accrued entitlements by age and sex with official data on the wealth distribution (Stewart (1991)).
22. Disney and Whitehouse (1992c).

Appendix 4.1 Valuing SERPS Entitlements

Those earning below the lower earnings limit or paying the married women's rate of National Insurance contributions do not earn entitlements to SERPS, unless covered by home responsibilities protection. Individuals who are contracted out into either a defined benefit or a defined contribution scheme will have their SERPS entitlement reduced by the guaranteed minimum pension they are (or, in the case of defined contribution schemes, are assumed to be) receiving; see Appendix 4.2.

Earnings above the National Insurance upper earnings limit are ignored. Earnings in each financial year since the introduction of SERPS in 1978–79 are revalued to the year of retirement using an index of economy-wide average earnings. From this figure, the value of the National Insurance LEL in the year prior to retirement is then deducted. (The rationale for this deduction is that the LEL is set approximately equal to the level of the basic state pension. Earnings below the LEL are 'replaced' during retirement at a 100 per cent rate by the basic state pension up to the LEL, and then at a lower rate thereafter. Without this deduction, earnings below the LEL would be replaced at a rate higher than 100 per cent.) This total of revalued earnings, net of the LEL, is then multiplied by an 'accrual factor' to arrive at the additional pension entitlement. The current accrual factor is $^1/_{80}$th, or 1.25 per cent.

The SERPS formula may be summarised

$$(4A.1)\quad p_{\text{SERPS}} = \sum_{t=1978}^{R} (W_t \frac{Y_R}{Y_t} - \text{LEL}_{R-1})\, x_{Rt} \quad \text{if} \quad \text{LEL}_t \leq W_t$$
$$(W_t = \text{UEL}_t \quad \text{if} \quad W_t > \text{UEL}_t)$$

where p is the value of the pension benefit, R the year of reaching state pension age, W individual earnings, Y an index of economy-wide average earnings, LEL and UEL the National Insurance earnings limits, and x the accrual factor.

For people retiring after 1998–99, the accrual factor is lower than the 1.25 per cent mentioned above, as shown in Table 4A.1. This is for two reasons. First, Social Security Act 1986 reduced

TABLE 4A.1
Accrual Rates for Additional Pension

Per cent

Year of retirement	Accrual rate on earnings	
	Between 1978–79 and 1987–88	*1988–89 onwards*
Before 1998–99	25/20 = 1.25	25/20 = 1.25
2000–01	25/21 = 1.19	25/21 = 1.19
2005–06	25/26 = 0.96	22.5/26 = 0.87
2010–11	25/31 = 0.81	20/31 = 0.65
2015–16	25/36 = 0.69	20/36 = 0.56
2020–21	25/41 = 0.61	20/41 = 0.49
2025–26	25/46 = 0.54	20/46 = 0.43
2027–28 onwards	25/49 = 0.51	20/49 = 0.41

Note: Assumes equalisation of pension ages as outlined in Department of Social Security (1993b). The denominator of the accrual rate calculation may be affected by credits for sickness, home responsibilities and unemployment.
Source: Government Actuary (1990).

the target 'replacement rate' for SERPS from 25 to 20 per cent of lifetime average earnings from 1998–99. This is represented by the decline in the numerator in the right-hand side of the table. Second, the accelerated accrual of entitlements introduced in Social Security Act 1975 begins to unwind. The reduction in the denominator in the table reflects the longer tenures in the scheme of those retiring after 1998–99. Overall, SERPS is considerably more generous for older cohorts: those born in the 1930s have an accrual rate more than three times larger than that of those born in the 1960s or afterwards. This result — that the earliest cohorts covered by a pension scheme get the best return — is often found in state pension schemes, as noted in Section 3.2. We also showed the impact of this reduced accrual rate on the relative returns to different generations from the state pension scheme.

Appendix 4.2 Valuing the GMP

Again, earnings above the UEL do not earn a GMP entitlement. But, rather than deducting the LEL in the year prior to the year of retirement *after* revaluing in line with earnings, the *contemporaneous* LEL is deducted and *then* the 'surplus' is revalued in line with national average earnings. With continued price indexation of the basic pension (and so the LEL) and assuming earnings continue to grow faster than prices in the long run, this ensures that the GMP will always be less than the SERPS entitlement based on the same earnings path. (SERPS and the GMP would be the same if the basic pension and LEL were indexed in line with earnings.)

The GMP formula can be summarised, in a similar way to (4A.1), by

$$(4A.2) \quad p_{GMP} = \sum_{t=1978}^{R} (W_t - \text{LEL}_t) \frac{Y_R}{Y_t} x'_{Rt} \quad \text{if} \quad \text{LEL}_t \leq W_t$$
$$(W_t = \text{UEL}_t \quad \text{if} \quad W_t > \text{UEL}_t)$$

where x'_{Rt} is the accrual factor for the GMP.

The accrual factor is a second source of difference between the GMP and SERPS, in addition to the difference in 'integration' of benefits with the basic state pension (through the time indexation

TABLE 4A.2

Accrual Rates for Guaranteed Minimum Pension

Per cent

Year of retirement	*Accrual rate on earnings, 1988–89 onwards*
Before 1998–99	20/20 = 1.00
2000–01	20/21 = 0.95
2005–06	20/26 = 0.77
2010–11 onwards	Same as SERPS

Source: Tolley's (1993).

of the LEL in (4A.2)). The scaling-down of second-tier benefits in Social Security Act 1986 was introduced straightaway, without the phasing in the SERPS formula. The 20 per cent target replacement rate applies in full from 1988–89, rather than being phased in over 10 years from 1999–2000. Thus, for all individuals retiring before 2010–11, the GMP accrual rate is below the SERPS rate. (See Table 4A.2.) The third difference between the GMP and SERPS regimes is in indexation of benefits during retirement. Whilst SERPS is fully indexed, the GMP is 'limited price indexed' up to a ceiling of 3 per cent.

These three factors mean that the GMP will nearly always be less than SERPS, and so even those contracted out will still receive SERPS. Of the 3.7 million pensioners with a notional SERPS entitlement in 1992, 2 million had some deduction for contracting out from their SERPS pension. Just 15,000 of these had *no* entitlement to (net) additional SERPS pension. (Department of Social Security (1993c).)

Appendix 4.3 Valuing Personal Pensions

The simple way in which defined contribution pensions can be valued at any point in the working life is complicated by the contracting-out provisions. Defined contribution schemes can contract out if they meet a guaranteed minimum contribution condition, rather than paying the GMP. The amount of the GMC is set at the same level as the National Insurance rebate for contracting out. In the case of personal pensions, National Insurance contributions are deducted by employers in the same way, and at the end of the financial year the rebate is transferred to a personal pension by the DSS. For defined contribution occupational schemes, a lower rate of National Insurance is paid as for defined benefit schemes. The employer is obliged to make the GMC, although is permitted to recover the rebate of employee's National Insurance contributions from the worker. The benefits resulting from these compulsory contributions to a contracted-out defined contribution scheme are known as the 'protected rights' pension.

The value of the eventual pension fund is the value of contributions and the investment return they generate prior to retirement. Thus

$$(4A.3) \quad p_{PP} = \sum_{t=0}^{R} [(W_t - \text{LEL}_t)\, c_t\, (1+r)^{R-t}] \quad \text{if} \quad \text{LEL}_t \leq W_t$$
$$(W_t = \text{UEL}_t \quad \text{if} \quad W_t > \text{UEL}_t)$$

is the value of the GMC paid into the scheme. The variable c_t is the contracted-out rebate, or GMC, plus the associated income tax relief. (Income tax relief is added at source to the rebate formally applicable to the employee; that is, 1.8 per cent of eligible earnings plus the 1 per cent incentive for over-30s. The rebate, including tax relief and the employer's rebate of 3 per cent, is therefore 6.7 per cent for a basic rate taxpayer over 30.) The Government stipulates that the protected rights pension must be converted to an annuity on reaching state pension age, with the same limited price indexation of 3 per cent as applies to the GMP. Again, the Government makes up the difference between SERPS and the notional GMP (see above). The result can be over-indexation of total pension benefits (if the annuity from the protected rights pension is below the notional GMP) or under-indexation (if it is greater than the GMP).

CHAPTER 5

Choice of Supplementary Pension Arrangements

5.1 Introduction

In Chapter 4, we discussed methods of valuing pension rights and examined choices between different modes of supplementary pension provision. In this chapter, we look in more detail at some of the issues surrounding choice of pension type. We begin in Section 5.2 with an analysis of the various causes of uncertainty about the ultimate value of a pension, and discuss the extent to which the various types of pension scheme available in the UK deal with each form of uncertainty. In Section 5.3, we move on to look at attitudes of both individuals and their employers to different types of pension scheme, and in particular at perceived advantages and disadvantages. Finally, in Section 5.4, we consider the extent of various forms of market failure in the provision of private pensions. We discuss failures in the annuity market, examine evidence on pension fund investment performance and consider the charges levied by personal pensions.

5.2 Pension Choice and Uncertainty

In Chapter 4, we argued that the structure of pension coverage among workers in the future would be determined by the relative costs and benefits of different types of pension scheme. We showed how these *ex-ante* pension values were subject to uncertainty as to the interest rate, earnings growth and pension scheme tenure.

TABLE 5.1

Pensions Insurance and Sources of Uncertainty

Source of uncertainty	*SERPS*	*Personal pension*	*Occupational pension*
Capital market	Y	S	S/Y
Earnings	S	S	N
Labour market interruptions	S	S	S
Social insurance	N	S	S/Y
Job tenure	Y	Y	S
Inflation	Y	Y	S

Source: Brugiavini, Disney and Whitehouse (1993).

This section analyses the effects of risk and uncertainty on pension choice and provides a more systematic framework which allows the extent to which different pensions provide different forms of insurance to be assessed.

Table 5.1 gives a stylised schema of sorts of uncertainty, and the extent to which different pension types insure against those risks. In the table, 'Y' denotes that the scheme offers full insurance, 'S' that there is some insurance possibility and 'N' that the pension is fully exposed to that source of risk, although these classifications are of necessity imprecise.

We focus on six sources of risk, which can be further divided by their scope. Risks over rates of return on investment and inflation levels are macroeconomic in origin and general in their application. Three sources of risk — regarding earnings, labour market interruptions and job tenure — relate directly to individual labour market experience. The final source of uncertainty — that of social insurance — is of special concern for state pensions and reflects the chances of the Government reneging on earlier promises.

CAPITAL MARKET RETURNS

The ranking of schemes' insurance against uncertainty of investment returns is relatively straightforward. SERPS is a

pay-as-you-go scheme and benefits are independent of the capital market rate of return. A personal pension is, in principle, purely dependent on investment returns and so offers no insurance; Figure 4.3 showed the degree of sensitivity to the rate of return. However, the key issue is not uncertainty *per se*, but whether a fund manager can, by suitable portfolio choice, eliminate forms of return risk. At its simplest, for example, an individual can invest in gilts to ensure a certain (albeit historically low) return. More complex hedging strategies that reduce risk without such substantial cuts in returns can be devised.[1]

A typical defined benefit scheme offers some degree of insurance relative to these polar extremes. Benefits are tied to final salary and are *explicitly* independent of fund performance, but a typical occupational pension scheme facing depressed capital market returns might be forced to increase contributions or to cut discretionary components of the scheme (such as discretionary indexation, early retirement provisions etc.). There is also a potential bankruptcy condition, given a positive relationship between profits and capital market returns.

At first sight, defined benefit pensions appear to offer substantial insurance possibilities against capital market risk, and defined contribution schemes are fully exposed. On closer inspection, there are a number of sources of sensitivity to capital market returns in defined benefit schemes, and defined contribution funds can be invested to minimise risk.

EARNINGS

The SERPS formula is based on average earnings over the lifetime, and therefore insures pension benefits against fluctuations in pay. Defined benefit schemes offer the least insurance against earnings uncertainty, as the benefit is typically related to final earnings or some average over the last few years. Final earnings are unknown during the working life. The value of a personal pension is determined by the level of contributions;

1. See Bodie, Marcus and Merton (1988) for a discussion of these issues.

the contracted-out rebate is a proportion of a band of earnings and extra contributions made by employers or employees are often some percentage of pay. Both SERPS and personal pensions offer superior insurance to occupational schemes against earnings uncertainty as they are based on earnings averaged across the lifetime rather than pinning the whole pension benefit on earnings in one year or a limited range of years.

Furthermore, personal pension members (and indeed their employers) are able to adjust contribution rates periodically if earnings fluctuate to maintain a target benefit level. Similarly, of course, occupational scheme members could make additional voluntary contributions, but the effect of uncertain earnings is only known *ex post*. Previous savings decisions cannot be reversed once the value of final salary is determined.

LABOUR MARKET INTERRUPTIONS

In its original form, SERPS provides protection against labour market interruptions because final benefit was based on the best 20 years of lifetime earnings. Now that is no longer the case, years out of employment lead to reductions in entitlement. There is currently no system of credits for years spent unemployed or with caring responsibilities, although the Government has promised to extend home responsibilities protection to SERPS. Occupational pensions penalise spells out of the labour market as a result of their lack of portability, which is discussed below. Most schemes offer some provision for ill-health retirement, although in more than half of private sector schemes this is merely the accrued entitlement at the time of leaving without enhancement. Since this is the same pension that would be received if the individual left the job, this cannot be described as insurance. Personal pensions are more flexible in two respects: the accumulated fund continues to earn market returns and there is greater flexibility as to when the pension can be converted to an annuity. Indeed, there are special provisions for occupations where careers typically end rather young,[2] although the earliest age for most individuals is 50.

SOCIAL INSURANCE

The role of social insurance uncertainty is emphasised by Bodie (1990). Most industrialised countries have seen frequent changes to public pension benefits — in Britain, for example, we have seen changes to the indexation arrangements for the basic state pension and the substantial downgrading of SERPS entitlements within a decade of the introduction of the scheme. We argued in Chapters 3 and 4 that these reforms stemmed mainly from conflicts over the costs of the state scheme and the benefits it provides to different generations. These conflicts render state schemes inherently unstable, with pensioners receiving on retirement benefits that are completely unrelated to those implicitly promised when they entered the labour market. For example, an individual entering the labour market in 1948 might reasonably have expected the Beveridge system to provide a pension worth some £23 in today's prices, which would not increase in real terms. In fact, they received on retirement, say in 1988, a basic pension more than double that level, SERPS (on average) of £10 a week and graduated pension of £2.30 a week,[3] approximately treble the original offer. In contrast, someone entering the labour market 30 years later, in 1978, might have expected that the basic pension would continue to be uprated in line with average earnings, and a SERPS pension of 25 per cent of their 20 best years of earnings. Social Security Act 1986 cut the generosity of SERPS in half, and the policy of indexing the basic pension in line with prices halves the pension value relative to earnings uprating every 35 years.[4] On current policies, someone entering the labour market in 1978 will receive less than half the state pension apparently offered when they entered the labour market.

2. For example, cricketers and trapeze artists may draw their pension from age 40.
3. Department of Social Security (1993c). Average amounts over the 1948–52 cohort.
4. Assuming 2 per cent per annum real earnings growth.

SERPS, as a state scheme, is subject to this social insurance uncertainty, as has been shown by its substantial downgrading in the 1980s. Private sector pensions are less subject to these changes, although tax legislation and the rules for contracting out can affect private pensions just as significantly.

Roughly half of private sector occupational schemes provide further insurance against this type of uncertainty, by 'integrating' benefits with the state scheme. The effects of future exogenous policy changes to the level of the basic pension on total pension benefits are offset by the scheme. Indeed, many defined benefit schemes in the US also offer this kind of insurance.[5]

JOB TENURE

Another source of uncertainty is pension scheme tenure. SERPS and personal pensions are fully portable between jobs, without penalty to pension entitlements. Occupational pension schemes may be portable without penalty between some, mainly public sector, jobs. In the main, however, protection is restricted to the limited indexation procedures of preserved benefits discussed below.[6] These, however, offer better insurance than employer-provided schemes in the US, where there is no indexation of preserved benefits.[7]

In Chapter 4, we showed how occupational pension rights could be valued and stressed the importance of assumptions about individual job tenure to the value of benefits. But even using our preferred method, which took into account probabilities of leaving a job at a particular time, we only came up with an *average* of expected survival in the pension scheme and therefore just an

5. Bodie (1990) and Merton, Bodie and Marcus (1987).
6. Alternatively, the individual may transfer benefits into either an occupational or a personal pension. The actuaries of the scheme that the worker is leaving must offer a lump sum equal to the present value of providing the preserved benefits. In so far as these transfers are indeed actuarially neutral (and ignoring transactions costs and rate of return uncertainty), transfers offer an identical benefit to preservation; see below.
7. Ippolito (1985).

FIGURE 5.1

Probability Distribution of Marginal Pension Value

average of pension values. In fact, for any individual, scheme tenure and therefore pension value are uncertain and there is a probability distribution of pension values which underlies the average.

We know what the value of the pension would be if a person were to leave in any particular year, and we can calculate the probability that a person will leave a pension scheme in any particular year. Therefore we can attach a probability to each possible pension value. For younger people especially, the range of possible values is immense. For a man aged 20 entering a scheme, there is an 8 per cent chance of the pension being worth less than £5,000 and an 8 per cent chance of it being worth as much as £45,000. Once age 40 is reached, however, there is much less variance, reflecting the rather small probability of leaving the scheme early.

Figure 5.1 shows the very great extent to which job tenure uncertainty affects the value of pensions. In particular, the bi-modality present over a large age range suggests that no single number gives a good indication of the value of pension accruals; none of the legal contract measure (V^L), the final salary measure (V^F) and the average measure used above (V^E) provides a very good indicator of likely pension value for individual decision-making.

INFLATION

SERPS insures against inflation before retirement with its indexation of entitlements by the growth of average, economy-wide earnings. Post-retirement, benefits are indexed to prices.

For personal pensions, prior to retirement the accrued fund increases with capital market returns. Post-retirement, the protected rights pension, like the GMP, must be limited price indexed. Indexation of the pension above that level is at the discretion of the annuitant.

Occupational pension schemes are required to uprate the GMP by average earnings or a set $7\frac{1}{2}$ per cent before retirement, along with limited price indexation (to 5 per cent) of the benefit over the GMP. The GMP post-retirement is again limited price indexed (this time to 3 per cent). The effects of price rises above the ceiling on the GMP are dealt with by the state, through full indexation

TABLE 5.2

Pre-Retirement Indexation Arrangements for Occupational Pension Schemes

Per cent

Pension increase	*Private sector*[a]	*Public sector*
5 per cent	10.2	
Limited RPI[b]	62.0	3.6
Discretionary over statutory minimum	15.2	0.7
Full RPI	10.2	95.5

[a] Contracted-out schemes only.
[b] Mainly 5 per cent ceiling, although a small number of private sector schemes have higher limits.
Source: Pension Law Review Committee (1993).

of the notional SERPS entitlement. In practice, many schemes offer indexation beyond these levels. Table 5.2 gives the uprating arrangements for the non-GMP component of pensioners leaving from 1991 onwards. The dominant form of uprating in the private sector is the statutory form of limited price indexation, with some schemes offering discretionary additions. Whereas nearly all public sector scheme members are offered full indexation of preserved benefits, just 10 per cent of those in the private sector are fully insured against inflation between leaving the scheme and retirement.

The examination of job tenure uncertainty and pension value above did not take account of incomplete indexation of preserved benefits when inflation exceeded the ceiling existing in many types of scheme. Here, we extend the analysis to look at the effects of inflation that exceeds the limits in Table 5.2 on the loss of pension scheme rights associated with job turnover.

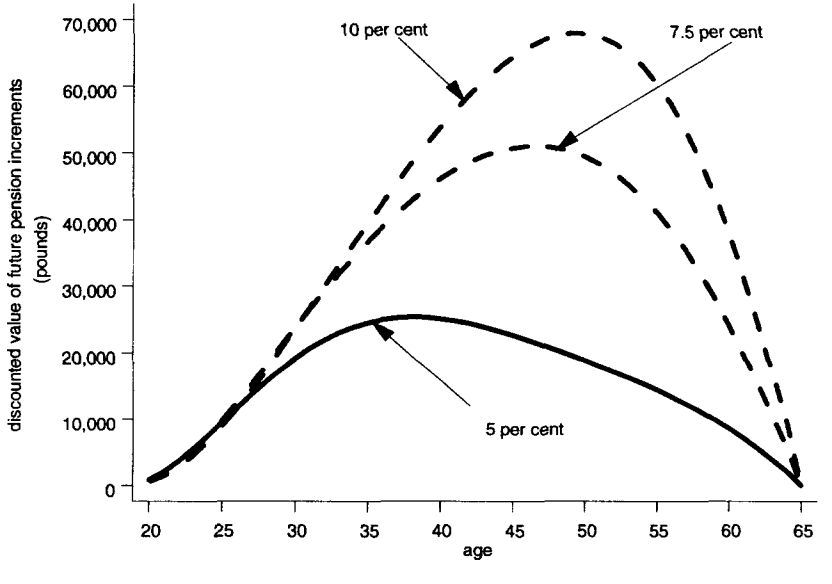
The loss of pension rights can be measured as the difference between the certain legal contract valuation in this period and the expected duration value next period. In other words, if an individual leaves a job now, then the value of the pension is just equal to the legal contract value, whereas if he does not, then in the next period, following our discussion in Chapter 4, the value

will be equal to the expected duration value. So the cost of leaving is the difference between the two.

Notwithstanding our previous reservations about using a single number to summarise pension accruals, this measure can provide a useful indication of the effect of inflation on accrued benefits. Figure 5.2 gives the value of this loss for our example individual. The magnitude of the loss depends on two future variables (the conditional change in the structure of survival probabilities from spending an extra year in the scheme and the extent to which probable final salary exceeds current pay) and one current variable (accumulated years in the scheme). With inflation at or below the limited price indexation ceiling,[8] the losses are substantially less than the high-inflation scenarios. At early ages, losses under any inflation level are constrained by the

FIGURE 5.2

Loss from Job Quitting at Alternative Rates of Inflation: Professional Man Joining Scheme at Age 20



8. Assuming no discretionary or guaranteed increases above this level.

low level of accrued entitlements. At higher levels of inflation, the loss curve peaks at a later age: under 40 for less than 5 per cent, around 46 for 7.5 per cent and 50 for 10 per cent inflation. The peak of the loss in the low-inflation case represents the point when predicted future earnings rises are large, and they will affect a large number of years of accrued entitlements. This is delayed by the effect of inflation. The scale of these losses is large: in each inflation scenario, the peak represents around a third of total accrued benefits.

TABLE 5.3

Post-Retirement Indexation Arrangements for Occupational Pension Schemes

Per cent

Pension increase	*Private sector*[a]	*Public sector*
None	4.3	
Discretionary	20.0	
Guaranteed	31.9	98.6
Guaranteed + discretionary	43.7	1.4
Pension increase guaranteed	75.6	100.0
Full RPI	8.6	95.5
Limited RPI[b]	34.9	3.1
Fixed amount	22.0	
of which:		
Less than 3 per cent	2.0	
3–4 per cent	14.1	
4–5 per cent	2.2	
More than 5 per cent	3.9	
Other	10.0	1.4

[a] Contracted-out schemes only.
[b] Mainly limited price indexation up to 5 per cent, although some increases equal to a percentage of the RPI rise.
Source: Pension Law Review Committee (1993).

Whilst average inflation may well not reach 10 per cent for a sustained period, there may be some risk of an inflationary episode between leaving a job and retirement. Price rises therefore remain an important source of uncertainty for the value of accrued pension benefits.

Practice over uprating of pensions in payment also varies between schemes, particularly in the private sector. Table 5.3 shows the post-retirement indexation procedures for the pension above the GMP. Again, nearly all public sector pensioners have full inflation protection, compared with under 10 per cent of those in the private sector. Indeed, in the private sector, a quarter of pensioners have no guaranteed pension increase during retirement. The majority of those with guaranteed increases are covered by some form of limited price indexation.

5.3 Attitudes to Pensions

Pension choice should depend on the relative costs and benefits of different types of scheme, and the risk attached to these returns. In previous sections, we examined 'optimal' pension strategies for individual choice between personal pensions and SERPS, and, in principle, the more complicated three-way choice between SERPS, personal pensions and entry to a defined benefit occupational plan (if covered). These decisions are not elementary, and a considerable degree of controversy has arisen over whether people can, and do, make these choices in a rational manner. For example, it is often asserted that personal pensions have been 'oversold' and that people have taken irrational or sub-optimal decisions to opt out of, or not join, employers' schemes.[9] In effect, this viewpoint questions whether individuals are able to make the 'correct' decision over choice of pension plan, and that, faced with campaigns to promote certain financial instruments, people are lured into incorrect strategies. The argument revolves around

9. One example is the full-page spread 'Hard sell increases the costly potential of "a duff product" ', *Financial Times*, 28 February 1994.

whether greater choice in pension provision is itself worth having, or whether it adds further confusion.

There has been a related concern at the use of this choice by individuals to divest themselves of pension provision, for example, by investing merely the minimum rebate for contracting out into a personal pension or remaining in SERPS rather than paying the potentially higher contribution levied by an occupational plan. Some 60 per cent of those in personal pensions do not add to the DSS contribution of National Insurance rebates to their fund. The argument over this behaviour therefore reflects a straight dispute between two points of view: first, the paternalist perspective, that individuals adopt lifetime inconsistent consumption patterns (and so savings strategies) and, as a consequence, 'under-invest' in pensions, particularly when young; second, a 'rational consumer' approach, that individuals may regard themselves as 'over-annuitised' in an occupational pension scheme if they (consistently) value current consumption more highly than consumption in retirement.

In this section, we investigate whether individuals appreciate the features of different types of scheme and how they arrive at their pension choices. This, and an analysis of employer attitudes to providing pensions, shed light on whether the future structure of supplementary pension coverage will follow the 'optimal' patterns described above.

EMPLOYEE ATTITUDES TO TYPES OF PENSION PROVISION

Some of the results of a large survey of individuals' views about different types of pension provision, conducted on behalf of the Pension Law Review Committee, are presented in Table 5.4. People were asked what they thought were the main advantages and disadvantages of different types of pension provision, citing up to two per scheme.

The most attractive characteristics of the basic state pension and SERPS were found to be security of benefits and the ease with which the scheme is understood; for occupational pensions, the fact that the employer contributed dominated the list of advantages. The most frequently cited disadvantage of state

TABLE 5.4

Perceived Principal Advantages and Disadvantages of Types of Pension Provision

Per cent

	State pensions (including SERPS)				Occupational pensions	
	Advantage	*Disadvantage*	*Balance*	*Balance*	*Advantage*	*Disadvantage*
Understandable	38	14	*+24*	*+8*	20	12
Flexible retirement	14	31	*–17*	*+16*	29	13
Adequate benefits	14	64	*–50*	*+17*	23	6
Portability	29	6	*+23*	*–32*	12	44
Secure benefits	41	2	*+39*	*–14*	8	22
Flexible contributions	7	24	*–17*	*–6*	12	18
Employer contributes	14	7	*+7*	*+36*	40	4

Note: Balance is difference between percentage citing the quality as an advantage of the scheme type and percentage citing it as a disadvantage. Respondents were able to choose up to two advantages and disadvantages per scheme.
Source: Pension Law Review Committee (1993). Sample of 6,000 men and women from OPCS Omnibus Survey.

pensions was their perceived inadequacy, while for occupational pensions it was their lack of portability.

For each of the seven characteristics considered, there were substantial perceived differences between the two schemes: state pensions, on balance, were thought to provide more understandable, portable and secure benefits. Occupational pensions were seen to have the advantage in adequacy, flexibility of retirement date and contribution levels, and the fact that the employer contributes. In the main, these perceptions show a good appreciation of the main features of the two types of scheme, including complex issues like lack of portability of occupational pensions.

TABLE 5.5

Perceived Advantages of Different Types of Pensions

About:	SERPS			OP			PP		
By those in:	*SERPS*	*OP*	*PP*	*SERPS*	*OP*	*PP*	*SERPS*	*OP*	*PP*
Easy to organise	39			12	17		2		5
Flexible contributions	5			15	11		45	53	
Employer contributes	19	12		38	52		1		
Lower NI	4			3	7	3	2		
Tax relief	7			10			13	19	
Lump sum	4			19		11	20	14	20
NI incentive	4		7	3			4	11	
No worries	29			9	17	9	5	3	5
Early retirement	8	3		14		10	26		
Late retirement	2			2			4		
Dependants	7			10	18	10	13		
Security	20	25		2			1		
Information	1			5			4		
Known amount	1	4		5			9		
Inflation	9			3	6	3	4		
One	9	13	9	9	6		10	5	
None	13	14	16	19	3	19	17		4

Notes: Sample of 16- to 44-year-olds drawn from National Insurance records. Respondents were asked to name *two* advantages from a list; some named either just one or none at all (shown in table). Columns therefore sum approximately (taking account of grouping and rounding) to 200 (with the group marked 'none' counting twice).

Percentage of members of each group. Proportions were tested using standard tests for significant differences, and the groups aggregated (weighted for the different numbers covered by each type of pension scheme) where differences were not significant. In these cases, the percentage is centred under the columns it refers to.

Source: Williams and Field (1993).

Whilst the data in Table 5.4 covered the population as a whole, they did not ask individuals about personal pensions, nor did they explicitly look at supplementary provision alone. State pensions as a whole were compared with occupational schemes, and the latter replace only some of the pension provided by the state. Table 5.5 looks at a sample of younger men and women who are more likely than older individuals to have or have considered a personal pension. Again, they were asked to name two principal advantages of types of provision: in this case, personal pensions, occupational pensions and SERPS. Table 5.5 also extends the analysis by disaggregating attitudes according to the individual's pension arrangements. Where the differences in perceptions were not significantly different between people in two or three scheme types, the results have been aggregated and the lines cross all the columns to which the percentage refers. There was a large degree of unanimity in attitudes, but some notable, large differences.

The principal perceived advantages of SERPS were that it is easy to organise, you do not have to worry about your pension and the benefits are secure. The main perceived gain from joining an occupational scheme was that the employer contributes. Other advantages commonly cited include the availability of a lump sum and provision for dependants. Flexibility in contributions and the availability of early retirement were seen to be the main attractions of a personal pension, again with some liking for a pension lump sum.

It is also interesting to note the proportion saying that the pension scheme had no advantages. For SERPS, this was roughly 15 per cent for people in each pension type, but for occupational and personal schemes there were significant differences, with only 3 and 4 per cent respectively saying that the type of scheme they were in had no advantages. But 19 per cent of personal pension holders saw no attractions in an occupational scheme, and 17 per cent of members of employers' schemes said the same about personal pensions.

Members of SERPS were much more likely to cite employer contributions as an advantage of that scheme, and much less likely to include them in their list of advantages for occupational schemes. This may reflect a greater appreciation of the fact that SERPS is at least formally financed partly by employer National

Insurance contributions (although the pay-as-you-go financing of this scheme makes the link with pension benefits less clear). There were also interesting differences in attitudes to pension lump sums. Members of occupational schemes were less likely to cite them as an advantage of personal pensions than members of the other two plans, and vice versa for members of personal pensions. Finally, in the light of the extensive discussion of pension benefits in Chapter 4 and the complexity of valuing all types of pension, it is not surprising that few mentioned providing a 'known amount' as an advantage of any plan.

TABLE 5.6

Perceived Disadvantages of Different Types of Pensions

Per cent

About:	SERPS			OP			PP		
By those in:	*SERPS*	*OP*	*PP*	*SERPS*	*OP*	*PP*	*SERPS*	*OP*	*PP*
Understandable	30			15			15		20
Flexible contributions	33			17	25	17	1		
Employer contributes	9	15	9	5	2		25	33	38
Cost	2			10	5		24		15
Lump sum	14			3			0		
Flexible retirement	24		30	12	17	12	2		
Dependants	9			4			2		
Security	1			18	11	18	18	29	18
Known amount	13			13	17		9		
Difficult	13		9	6	9		3	6	
Inflation	5			9			8		
One	10			24		16	20		
None	16			33	27	33	35	27	

Note: See notes to Table 5.5 for a description of sample and methods.
Source: Williams and Field (1993).

In Table 5.6, we look at the disadvantages listed by the survey respondents. Again, a number of individuals said that the fact that the pension amount was not known was a drawback of each type of scheme, though overall in both advantages and disadvantages, personal pensions were believed to offer the greatest transparency. The most unpopular features of SERPS were the difficulty in understanding the scheme, inflexibility of contribution levels and retirement, and the lack of a lump sum. The main concern with occupational schemes was again inflexibility of contribution levels and also security of benefits. As expected, the lack of employer contributions topped the list of disadvantages of personal pensions, followed by the cost of the schemes and insecurity of benefits. It is interesting that members of SERPS were significantly more likely to cite cost as a disadvantage of either of the other two schemes, particularly following the discussion of over-annuitisation.

As with the responses to the Pension Law Review Committee survey, this rather more detailed breakdown shows a generally accurate set of perceptions about the characteristics of different types of pension plan among members of all three schemes. The only major worry from Tables 5.5 and 5.6 is the failure to appreciate the importance of inflation. Few cited inflation protection as an advantage of SERPS (which offers full indexation pre- and post-retirement) and as a disadvantage of occupational schemes (many of which offer only limited uprating before retirement and when in payment). This is consistent with evidence from the US. Bodie (1991) suggests three reasons for lack of indexation of employer-provided pensions, both pre- and post-retirement.[10] One is that employers do not have access to assets with which to hedge inflation risk. Elsewhere, however, strategies to hedge inflation risk have been outlined[11] and, indeed, in Britain the Government offers index-linked securities. The other two reasons relate to employee preferences. One is that other assets

10. See also Clark (1990).
11. For example, Bodie (1980) suggests a strategy using commodity futures markets. As Kotlikoff (1988) comments, 'many retirees may not know how to devise such portfolios'; perhaps few fund managers would know either.

(such as property or social security benefits) provide sufficient hedging against inflation. However, the view that fully informed individuals do not want to insure their real living standards, preferring an uncertain income stream instead, seems unlikely. Most plausible is that employees suffer from 'money illusion'. Indexing benefits is costly for employers. If their employees are oblivious to the effects of inflation, then this is an unnecessary expense; it is cheaper to let the value of pension benefits wither away. Both US and British evidence suggests a failure to appreciate the effects of inflation on pension values.

OCCUPATIONAL PENSION SCHEME RIGHTS AND EXPECTATIONS

Surveys of employees suggest that few workers consider it an advantage of any type of pension scheme that it offers a 'known amount'. Indeed, the discussion at the beginning of this section raised concerns that people are unable to make rational choices over types of pension provision. Unfortunately, there is no empirical evidence of which we are aware to show the extent to which individuals overvalue or undervalue their occupational pension scheme entitlement in Britain. The available evidence is confined to retirement incomes as a whole.

The Retirement Survey asked 1,700 retired men and women between the ages of 55 and 69 how their post-retirement income compared with their expectations before retirement. Just 10 per cent said that their expectation was exceeded, and 40 per cent said that their income proved to be less than they thought. Further, expectations before retirement do not seem to be particularly high: only a third of those working expected an income in retirement that would equal or exceed their income when working. Another third thought their retirement income would be less than half the pre-retirement level. Thus, those who are near retirement have a low expectation of their retirement income and those who have recently retired generally find that their expectations were too high.[12]

On occupational pensions specifically, employees have unrealistically high expectations of future benefits. In the US, for example, the President's Commission on Pension Policy[13]

surveyed employers, employees and actuaries for a sample of pension plans. Each was asked for their estimate of the projected benefit at retirement and what benefits were currently accrued and would be paid in the event of a scheme termination or the individual leaving the job. For projected benefits, the employees' valuation was 77 per cent above that of the employers. But for accrued entitlements, the gap was much bigger: the employees' estimate is some 3.6 times the employers'. But even the employers' estimate is optimistic: it is 21 per cent above the estimate of the actuaries, which will determine what benefit would be paid. In the event of leaving a job or a scheme, the actuarial computation would yield a benefit less than a quarter that expected by the employee. (See also Ghilarducci (1984, 1992).)

Evidence from the US suggests that the gap between expectations of and rights to pension benefits is extremely large. There are few data to confirm or contest the assertion that employees in Britain overvalue accrued entitlements to this enormous extent. But anecdotal evidence and the repeated use of the phrase 'rights and expectations' in a number of official consultative documents[14] suggest that there is a large gap between legal rights and individual expectations.

These results have important implications for pension plan design. Retirement income planning is a complex area of personal finance. There may be informational economies if firms define and provide an 'adequate' level of saving for retirement. If adequacy is interpreted as maintaining some proportion of income in work into retirement, then defined benefit pension plans, offering such a pension, are easy to comprehend. However, the calculations in Chapter 4 showed that job mobility meant very few people reached

12. Since the retirement decision is obviously endogenous to these income expectations, there may be sample selection bias in these statistics: those with high expectations of income in retirement leave work; those with lower expectations do not retire.
13. The Commission was set up by the Carter administration in 1979 and reported in 1981.
14. For example, Occupational Pensions Board (1981), *Improved Protection for the Occupational Pension Rights and Expectations of Early Leavers*.

the target replacement rate set by pension benefit formulas. Further, the evidence above suggests that individual perceptions of the value of these pensions may be seriously amiss. Arguments such as 'defined benefit pensions retain an advantage over defined contribution, given their superior "employee retirement insurance" '[15] do not stand up when account is taken of the risk in pension benefits arising from uncertainty in future earnings and pension scheme tenure.

EMPLOYER ATTITUDES TO PROVIDING PENSIONS

Although two-thirds of workers in Britain are employed by a firm with some kind of pension plan, there is no compulsion on firms to provide one. Employers' position on pension provision is therefore an important determinant of how the pension market will develop.

Employers tend to cite three main reasons for providing occupational pensions: paternalism, labour market reasons and to 'reward' employees.[16] The first motive dominates in larger firms, the third in smaller companies, which are usually selective over who is asked to join. Employers without pension schemes usually suggest cost as the principal reason, though many think their employees are not interested (usually because of low pay) or take a *laissez-faire* approach.

Among those providing occupational pensions of whatever type, the attitude that defined benefit pensions are the 'best' for employees prevails. Disadvantages cited by those operating defined benefit plans, and as advantages of defined contribution plans by firms offering these arrangements, mainly relate to the possibility of shifts in age structure of the work-force having adverse consequences for scheme finances. Some managers mention the importance of attracting mobile workers, and a large number are worried by the potential cost of future legislative and regulatory changes. However, few are concerned about recent

15. Davis (1992).
16. Casey (1993).

policy shocks — limited price indexation of pensions in payment (Social Security Act 1990), a price-indexed cap to pensionable pay (Finance Act 1989) or possible retrospective equal treatment provisions following the *Barber* v. *GRE* judgment in the European Court of Justice. Many, though, would have reviewed pension provision if the Pension Law Review Committee (chaired by Professor Roy Goode) had recommended dramatic changes to the regulatory regime. In the event, the Goode Committee made no such dramatic proposals. As a result, regulatory pressures are unlikely to induce employers to alter pension provision.

In Chapter 2, we illustrated the doubling in the number of members of defined contribution schemes. A recent survey of new defined contribution schemes[17] with over 60,000 members asked employers their motivation in setting up contracted-out defined contribution schemes. A number previously had contracted-in schemes (both defined benefit and contribution formulas), but wanted younger employees in particular to benefit from the generous contracting-out terms without needing to take out a personal pension. Many also offered a contracted-out defined benefit scheme, with only a few setting up a scheme from scratch. Motives among these firms included wanting to cover part-time workers, whose hours and pay varied frequently (Tesco, Asda), or workers who were part of a direct sales force paid significantly through commission, again resulting in variable earnings (Nationwide Building Society, Rank Xerox). Some wanted a more portable pension scheme (Whitbread, United Magazines). Finally, a number were keen to avoid government regulation of benefits: *The Independent*, for example, spoke of 'open-ended funding liabilities subject to the whim of government'.

Other studies found that smaller companies running a defined benefit scheme preferred a defined contribution scheme, but were unwilling to make the transition to defined contribution. A survey by the Prudential[18] found that only 10 per cent of smaller firms would set up a defined benefit scheme now, rising to 74 per cent

17. *Occupational Pensions* (1992).
18. Prudential (1990) and Bedell-Pearce (1992).

of the largest employers (which dominate the occupational pensions market). On transitions, 30 per cent of the largest and 40 per cent of smaller companies said they would consider converting to a defined contribution formula.

Employers' main motive for providing pensions is a paternalist one, and defined benefit schemes are favoured. This contrasts with employees' attitudes, which did not reach the same consensus that defined benefit plans are best. However, in cases where portability is important or where there is no clear definition of final salary, defined contribution schemes have come into favour among firms. Although many employers are concerned by the extent of regulation of defined benefit occupational pensions, few defined contribution schemes cite avoiding these rules as one of their reasons for choosing that benefit formula.

5.4 Pension Provision and Economic Efficiency

In Section 3.4, we highlighted a number of areas in which market failures might lead to economic inefficiency in pension provision, arising from asymmetries in the information open to pension plan members and providers. In annuity markets, this can result in adverse selection effects, implying that pensions do not give a fair return relative to other assets. In labour markets, pensions may be an efficient contract, generating incentives to stay with a particular employer and to work hard. In the market for investment, these asymmetries lead to agency problems: fund managers may not provide maximum returns and may not administer the fund efficiently.

These factors impinge both on optimal individual choice between pension plans and on pensions policy: what structure of pension plan results in economic efficiency? In this section, we investigate empirical evidence of the importance of market failure and pensions.

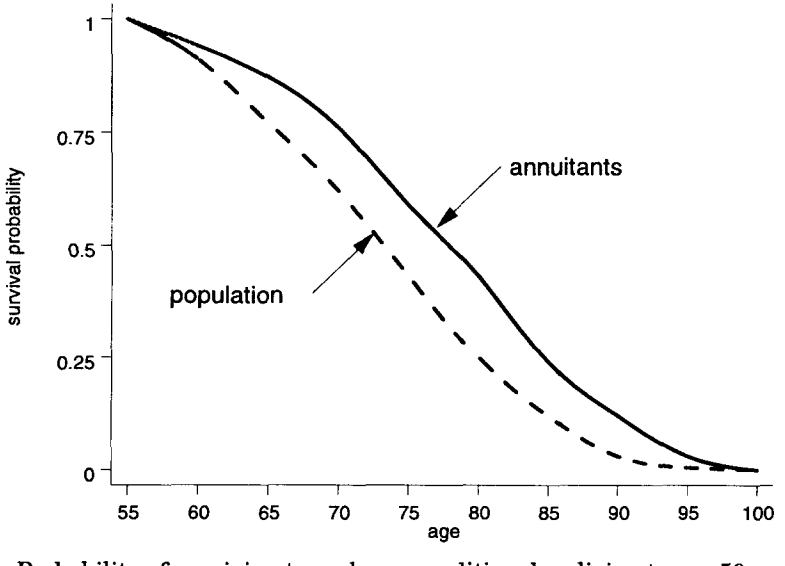
ANNUITY MARKETS

In defined contribution schemes, on reaching retirement, individuals use some or all of the accumulated lump sum of contributions and investment returns to buy an annuity, usually from a life insurance company. If the annuity market 'fails' because of the effects of adverse selection, then people with high mortality will either get a worse return (on average) from the annuity relative to other riskless assets, or will not be insured.

By using data on the actual survival of annuity purchasers against the population as a whole, the impact of adverse selection can be measured. Figure 5.3 shows survival probabilities in Britain for a man aged 50 based on the population level of mortality, and then looks specifically at the subset of the population who buy annuities. A sizeable gap in the survival rates has already appeared by age 60, and the gap grows until after age 75 to reach a peak of nearly 20 per cent. In both Britain and the

FIGURE 5.3

Survival Probabilities for Population and Annuitants



Note: Probability of surviving to each age conditional on living to age 50.
Sources: Brugiavini (1990) and Association of British Insurers' *Continuous Mortality Investigation.*

US, the survival rates for annuitants and people who do not buy annuities are significantly different.

To calculate the weighting in annuity prices in the market requires a number of steps. First, data on annuity rates offered by firms can be manipulated so as to give a rate of return on the investment in the annuity. This can then be compared with the return on other riskless assets, such as gilts. The gap between the two will reflect a number of factors, including the degree of risk aversion, adverse selection, transactions costs and the extent to which the annuity market is competitive. Since we know the survival probabilities of annuitants as well as of the population as a whole, we can perform a second calculation that works out the rate of return on the annuity investment under these survival assumptions. The difference between this return and the rate of return calculated using population estimates of survival gives the impact of adverse selection. The other factors make up the difference between the return using annuitants' survival and the return on other riskless assets. We now implement this approach using data for the US and Britain.

US data spanning 16 years suggest that at population levels of mortality, the rate of return on an investment in an annuity varied between 2.3 and 6.8 per cent a year depending on when it was bought.[19] This was between 4.2 and 6.1 per cent below investment in other safe assets, the difference representing both adverse selection and the other factors listed above. Using actual annuitants' survival rather than the population's, the yield differential fell to between 2.4 and 4.4 per cent below alternative investments, reflecting the greater longevity of the annuitants. Thus adverse selection reduced the return on US annuities by around 2 per cent a year, whilst other factors, such as the costs and profits of life insurers, reduced the return by around 3 per cent a year.

Data for Britain for the period 1977–86 suggest a much smaller differential.[20] Using general population mortality rates, yields are between 2.9 and 3.1 per cent below the return on alternatives.

19. Friedman and Warshawsky (1990).
20. Annuity prices from *Planned Savings* and annuitants' mortality from the

Taking account of greater longevity of annuitants, the difference falls to between 0.8 and 0.9 per cent.[21] As with the US, therefore, adverse selection cuts the rate of return by around 2 per cent a year, but unlike the US, the return on annuities tracks the return on riskless assets rather more closely. The less than 1 per cent reduction in yield from investing in an annuity relative to other assets may suggest that these assets form a much larger part of the portfolio of life insurance companies in Britain than in the US.

It is perhaps easier to understand these relationships if we express them as effects on annuity prices. The adverse selection effect is the difference between the annuity rate computed with population mortality and the rate with mortality at the average level of annuitants. The US evidence suggests a 14 per cent premium on annuity prices to reflect greater longevity risk; the larger differential in the UK implies a premium of 18 per cent. A further 'load factor' — the difference between market returns and the return on annuity investment — reflects insurance companies' costs and profits. As noted above, this is far higher in the US, suggesting an 18 per cent premium compared with 9 per cent for Britain.[22]

This result has important implications for annuity markets and pension policy. It is often argued that this explains why annuity markets are 'thin'[23] compared with theoretical results that conclude that, in the absence of a bequest motive, consumers will annuitise all their wealth.[24] In the US and the UK, around 1 or 2 per cent of households hold annuities and these represent a tiny proportion of total wealth.[25]

Association of British Insurers' *Continuous Mortality Investigation*.

21. Brugiavini (1990, 1993).
22. Friedman and Warshawsky (1988) and authors' calculations based on Brugiavini (1990).
23. Friedman and Warshawsky (1990). However, these results ignore the fact that wealth tied up in both the state and private pension schemes *is* annuitised, and that this represents a very large proportion of total wealth.
24. This is a direct result of the life-cycle theory of consumption: Modigliani and Brumberg (1955) and Yaari (1965).
25. Bernheim, Shleifer and Summers (1985), King and Leape (1988) and Brugiavini (1993).

In practice, we expect that personal pension holders will not be detrimentally affected by adverse selection because both the ameliorating factors that restore economic efficiency are present. By purchasing a personal pension, people are pre-committed to purchasing an annuity, in most cases at an early age. They are unlikely, therefore, to have significant information about their longevity. Further, there is an element of compulsion from the state in supplementary pension provision.

AGENCY AND INVESTMENT RETURNS

The characteristics of defined benefit and defined contribution schemes may result in different market outcomes. Pension fund management is a principal–agent problem: the fund manager (agent) is empowered by the pension plan member (the principal) to invest their retirement savings. As argued in Section 5.2, investment returns affect defined contribution pensions directly, but also indirectly affect the value of defined benefit pensions.

Agency problems can result in economic inefficiency. Pension plan members may not be able to monitor the efforts of their agents effectively, or indeed may not have choice over who invests their money. This can have three costs. First, the agent follows his or her own goals, rather than adopting the principal's preferred risk–return strategy. Second, this may result in under-performance relative to markets. Third, the fund manager may not have an incentive to keep costs down.

On the first of these, defined contribution schemes have a considerable advantage, since they typically open up a large number of risk–return options to individuals that are otherwise unavailable. Table 5.7 shows the breadth of investment opportunities open to holders of personal pensions. Almost all firms in the sample offer more than one option of investment fund. Indeed, half of providers offer eight or more of the 10 investment areas listed in the table, in addition to a managed fund.

The risk–return options in defined benefit schemes like occupational pensions and SERPS are highly limited, being related to future realisations of earnings and job tenure (notwithstanding the indirect link between capital markets and defined benefit pensions). In contrast, members of personal

TABLE 5.7

Investment Options of Personal Pension Members

Type of fund	*Number of firms*
Managed fund	62
UK equities	53
International	51
European	37
North American	38
Far Eastern	31
Japanese	16
Money	58
Fixed interest	51
Indexed	32
Property	52

Note: Number of firms offering fund of each (or similar) type. Firms may also offer more than one fund under each heading. (This repetition is excluded.)
Source: Sample of firms providing data on investment to Walford (1993).

pensions have many more strategies, with a broad set of options for the variable to which their future pension entitlement is linked. For example, an individual might reason that their future prosperity was already sufficiently dependent on the performance of the British economy (if they do not intend to emigrate), and may therefore choose to invest in, for example, international equities. Another investor may be particularly risk averse, and so choose to invest in fixed interest securities or cash, or even an indexed fund. Indeed, many personal pensions have been marketed on the premiss that the portfolio can be shifted towards less risky assets as the individual nears retirement and may become more risk averse. In occupational schemes, there is no mechanism by which individual risk–return preferences can affect investment strategy. Again, however, there is an issue of paternalism: can and do

people make 'correct' choices? In the US, for example, individual retirement savings have been found to be invested extremely conservatively, with few portfolios dominated by assets such as equities which have historically generated much larger (albeit more risky) returns than fixed interest securities.

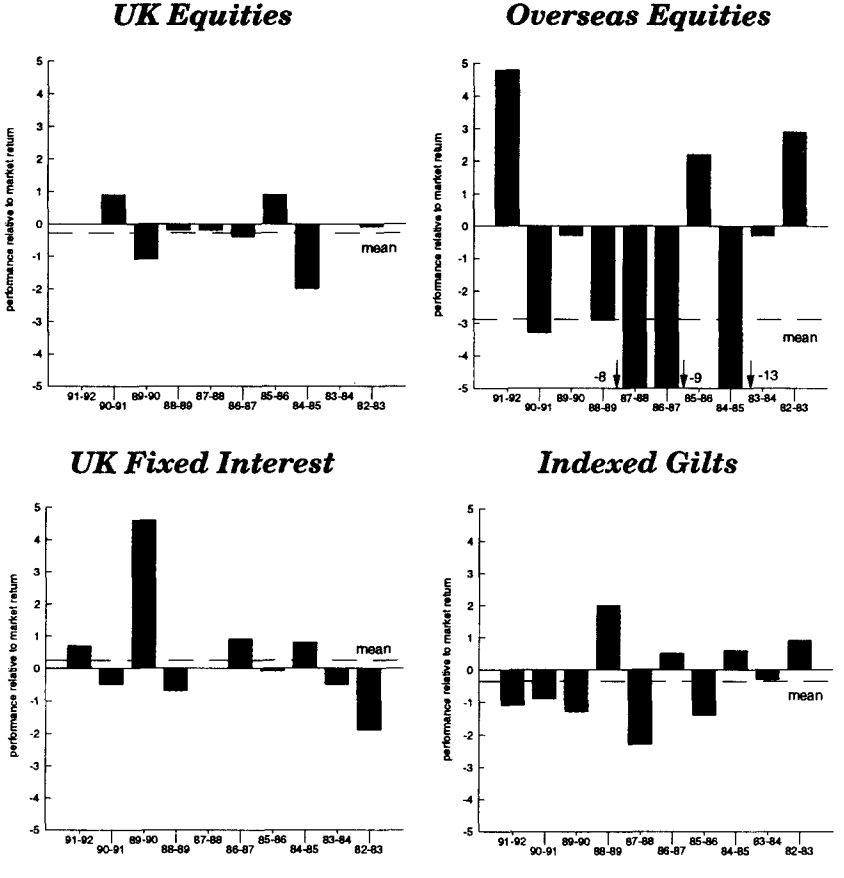
The question of whether agency slack and management slack lead to under-performance relative to market returns can be addressed empirically. Some evidence supports under-performance in the US.[26] Defined benefit plans tend to manage equity holdings more actively than defined contribution plans. The latter typically invest to achieve a guaranteed minimum return. This might suggest that defined benefit plans should outperform the market (relative to passive portfolio holding), whereas defined contribution schemes (invested at the safe end) would not. But, in fact, managers of defined benefit funds under-perform significantly. Between 1983 and 1989, the equally-weighted return for funds was 1.3 per cent below the Standard & Poors 500 index, and value-weighted by fund size, 2.6 per cent below the index return of 19 per cent. Other institutional investors — such as mutual funds (unit trusts) — outperformed the market. Thus US evidence suggests that the absence of competition and the principal–agent problem together lead to agency slack and under-performance relative to the market.

The empirical evidence in Britain leads to a somewhat different conclusion regarding defined benefit schemes.[27] Around 90 per cent of pension funds are invested in equities, with British equities accounting for two-thirds of that total. Following the abolition of exchange controls in 1979, there has been a steady increase in the share of overseas equities, in effect substituting mainly for British fixed interest securities. Property portfolios were reduced over the 1980s, and in the late 1980s there was a shift to a more liquid portfolio, probably reflecting the 1987 equity market crash and the growing maturity of many occupational schemes (see Appendix 5.1). It is interesting to note the low

26. Lakonishok, Shleifer and Vishny (1992).
27. Disney and Whitehouse (1994b).

FIGURE 5.4

Pension Fund Performance Relative to Market, 1981–91



Note: Difference between pension fund returns and market returns in each case. Dashed line shows mean relative performance over the whole 10-year period. Differences greater than 5 per cent truncated on chart and value given.
Source: Combined Actuarial Performance Services (1993).

proportion of funds invested in index-linked gilts (around 3 per cent), especially given the increased role of limited price indexation in pension fund liabilities. The Pension Law Review Committee (1993) has suggested that the Government should

issue more suitable securities, mirroring these limited indexed liabilities.

In Figure 5.4, we present some numbers showing the relative performance of pension funds over the past decade. In each year, the figure shows the difference between pension funds' returns and the market return. In the domestic equity and indexed gilt markets, the returns are slightly lower than for the market as a whole, but the difference is nowhere near as substantial as that found in the US. One reason is, of course, the dominance of the pension funds in the equity market. Given that they account for 32 per cent of stock market capitalisation,[28] it is not surprising that the mean returns are very similar, and that there is little volatility relative to market returns. Domestic fixed interest securities show some evidence of limited outperformance by pension funds. The return on overseas equity investment was substantially behind market returns and relative performance extremely variable compared with that of other assets. However, under-performance at the average might reflect a risk-averse investment strategy in foreign markets.

An analysis of pension fund performance does not provide evidence of problems of agency slack or management slack in the investment returns of defined benefit pension funds in Britain.

The third source of inefficiency is in administrative expenses. Indeed, many commentators have pointed to the 'excessive' charges levied on individuals contracting out into personal pensions. Measuring the impact of charges is extremely difficult. Pension providers typically levy a mixture of both flat-rate and contribution-related, and 'one-off' and recurring, charges. These may include a number of the following:[29]

- *Policy, plan or administration fees* are a regular (usually monthly or annual) fixed charge. Most providers levy a charge of the order of £30 per annum. Many uprate this recurring fixed charge in line with earnings or prices.

28. Hoffman and Lambert (1993).
29. These refer to unit-linked pensions. Few firms now offer conventional 'with profits' policies, though many offer a hybrid unitised with profits plan.

- *Bid–offer spreads*, in contrast, are an upfront charge, rather similar to the operation of unit trusts. The provider sells units in the pension fund for (usually around 5 per cent) more than they will pay to buy them back.
- A second form of upfront charge is through *unit allocations*. The provider gives the personal pension member only a proportion (usually 90–100 per cent) of the units they have bought. These allocations often vary with the size and frequency of the premium and with either the term to retirement or individual age (higher charges are levied on smaller premiums and individuals closer to retirement).
- *Initial charges* and *capital levies* similarly are additional upfront charges levied in the first one or two years of taking out the pension. These may be a fixed fee (e.g. £60) or a percentage charge on the contribution (e.g. 5 per cent).

The charging mechanism varies significantly between schemes, and the impact of the different charging structures varies between individuals in different circumstances. The scale of the charge varies with the amount of contributions (smaller contributions will face a higher charge with flat-rate fees) and with the length of time in the scheme and the length of time to retirement (higher 'upfront' charges will hit those with a short time in the scheme). This variation across schemes and individuals means the assessments of charges presented below are purely illustrations, dependent on the assumptions about individual circumstances used.

Subject to this caveat, Table 5.8 shows the effect of charges on two illustrative policies: a five-year pension plan with monthly premiums of £200, and a plan bought with a single £10,000 premium five years before retirement. All the different types of charges are amalgamated into a single percentage figure, reflecting the amount available to the individual for buying an annuity from a different pension provider.[30] The results are based on a sample of 90 personal pension providers, and assume 5 per cent inflation, 2 per cent real earnings growth and a 5 per cent

TABLE 5.8

Distribution of Personal Pension Charges

Per cent

	Mean	*10%*	*25%*	*Median*	*75%*	*90%*
Monthly premium £200	12.9	8.5	11.2	12.7	14.5	18.1
Single premium £10,000	10.2	8.2	9.2	10.3	11.3	12.6

Note: Table shows mean, median, upper and lower quartiles, and top and bottom deciles of the distribution of charges on two illustrative pension contracts. Assumptions and method described in text and further in Walford (1993).
Source: Sample of 90 providers from Walford (1993).

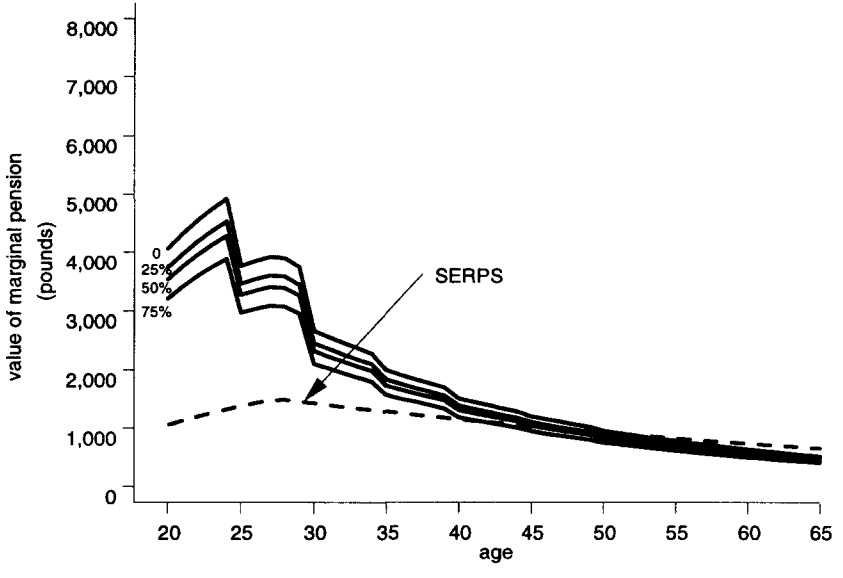
real rate of return. For a regular premium plan, charges result in an average reduction of just under 13 per cent compared with the gross return. The distribution of these charges is very broad: both top and bottom deciles are 50 per cent larger (respectively smaller) than this figure. For single premium annuities, the effect of the charges is smaller — around 10 per cent on average — and varies less between firms — around 20–25 per cent more or less than the average.[31]

What is the impact of charges on the personal pension valuations obtained in Chapter 4, and the relative attractiveness of personal pensions *vis-à-vis* SERPS? Figure 5.5 shows the effect on the marginal personal pension value of the charging levels for regular contributions given in Table 5.8. As with changes to the rate of return, the curves rotate downwards rather than shift, since we have assumed a proportional charge as a percentage of the final pension value. Including transactions costs again does not affect the qualitative result in Chapter 4 — that a switching

30. Some firms charge a penalty for exercising this so-called 'open-market option'. This penalty is included in the figures, so they overstate charges for those buying their annuity from the firm that managed their account prior to retirement.
31. These figures imply higher charges expressed as a percentage of contributions, since the charge here is expressed as a percentage of contributions and their associated investment returns.

FIGURE 5.5

Marginal Increment to Total SERPS and Personal Pension, by Age and Transactions Costs



Note: Zero, lower quartile, median and upper quartile of charges from Table 5.8.

strategy between the two schemes is optimal — but does affect the best age for contracting back in. At the median level of transactions costs, the age shifts back to 45, and close to 40 at the upper quartile level. Thus, personal pension charges do not substantially affect our previous results.

Are the charges in Table 5.8 'excessive'? To evaluate the scale of charges, one needs to consider what economic factors determine the level and structure of charges. The most important element is likely to be the industry's cost structure, including fund management expenses, the cost of compliance with the regulatory regime[32] and promotional outlays. Management expenses may

32. In the case of contracted-out personal pensions, this includes separate rules pertaining to the DSS (contracting out), the Inland Revenue (contribution limits and benefit limits) and the financial market regulators (the Life

also vary according to the quality of service provided, for example in the provision of information and choice. A second important factor is the degree of competition, which will determine the size of the monopoly rents that pension providers can reap. At first sight, a market with 90 providers might seem highly competitive. However, the complexity of the charging structure and limited disclosure of charges and commissions have led to a less transparent regime. Competition on quality and through advertising is likely to dominate competition on price.

The implication of those who argue that personal pension charges are 'excessive' is that the administrative expenses of other types of pension provision are lower. In contrast to personal pensions, there are few data available on the costs of occupational schemes, and many of these are unreliable because a large proportion of pension costs are borne directly by the employer, rather than attributed to the pension fund. Government Actuary (1991) found that measured expenses included in pension fund accounts were approximately 12 per cent of contribution income. However, this is not comparable. First, it is measured as a proportion of contributions, not eventual benefits for the individual as in the personal pension case. Second, many of the expenses of operating a pension scheme are borne directly by the employer, not the pension fund. The National Association of Pension Funds (1994) reports that a fifth of private sector firms even paid for the cost of fund management directly.

In the US, more reliable evidence is available. There were found to be considerable economies of scale in managing pension funds, and group defined contribution schemes were found to be consistently cheaper than defined benefit plans. For example, schemes of around $1 million had expenses of 1.4 per cent of funds on average with a defined contribution formula, and 2 per cent average for defined benefit. For larger funds — around $150 million under management — costs fell to 0.2 per cent for defined contribution plans and 0.7 per cent for defined benefit.[33]

Assurance and Unit Trust Regulatory Organisation and the Securities and Investments Board).

Appendix 5.1 The Maturing of Occupational Pensions

Occupational pension coverage peaked in the mid-1960s, since when it has remained relatively flat. But the fact that coverage of workers has remained at around one-half for 30 years does not mean occupational pensions have reached maturity yet. As with any pension system, the scheme is only formally mature when all pensioners spent their whole working life under that regime. In this case, that occurs when the last member of the cohort born in the mid-1940s, entering the labour market in the mid-1960s, dies, which will be around the middle of the next century.

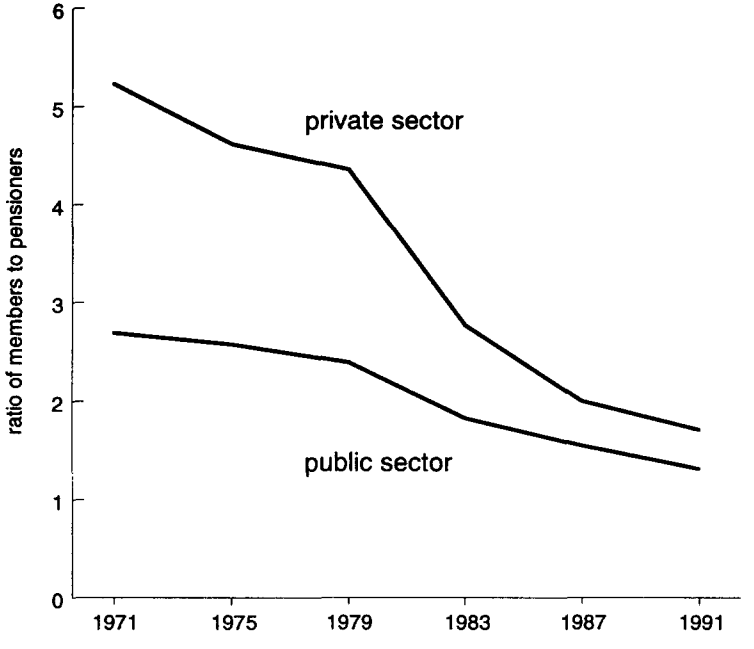
The relative maturity of any type of pension system has important implications for its financing. In a funded scheme, for many years the fund will continue to build up, since there are few beneficiaries and a growing number of contributors. As the scheme matures, the number of contributors stabilises first, and the number of beneficiaries continues to rise. The size of the fund is then much more stable, and flows of contributions and benefits move closer together.

Figure 5A.1 shows how occupational schemes have matured over the last 20 years, giving the ratio of workers in pension schemes to pensioners, akin to the support ratios for the population as a whole presented in Section 2.4. Coverage peaked earlier for public sector schemes, so in 1971 there were over five contributors per beneficiary in private sector plans compared with fewer than three in the public sector. But as the expansion of private sector coverage slowed, the support ratio in the private sector decreased more quickly. The recession of the early 1980s accelerated this process: the use of early retirement provisions by employers reducing work-force size both cut the number of workers and increased the number of pensioners. Higher levels of unemployment, too, cut the number of workers but did not increase the number of pensioners. By the 1990s, the support ratios had fallen to 1.8 in the private sector and 1.4 in the public.

33. Turner and Beller (1989).

FIGURE 5A.1

The Maturing of Occupational Pension Schemes



Note: Ratio of employees who are scheme members to pensioners. Excludes preserved pensions of former scheme members.
Sources: Government Actuary (1991) and Pension Law Review Committee (1993).

CHAPTER 6

The Future of Basic State Provision

6.1 Options for the Future

The main features of basic first-tier state provision were outlined in Chapter 2. We currently spend £26.4 billion annually on providing a contributory basic state pension of £57.60 per week, and a further £11 billion on other benefits for the elderly including means-tested benefits which are received by over a third of all pensioners. Over the last 14 years, the basic pension has risen annually in line with prices and, as a result, has fallen behind general income levels which have risen faster than the price level. Income support levels, by contrast, have risen rather faster than prices and are currently at levels above that of the basic pension.

A continuation of this policy, and in particular of the policy of uprating the basic pension in line with prices, will result in a fundamental shift in the nature of state provision for pensioners. It will also result in a shift in the composition of incomes of pensioners at all points in the income distribution. It will eventually lead to a situation in which the relative value of the basic pension becomes 'nugatory', as Michael Portillo, Chief Secretary to the Treasury, put it. To understand these points is to understand where we are starting from, and will provide part of the basis for seeing how policy might need to change.

Does it matter that the basic pension is rising in line with prices rather than with earnings, or some other measure of general living standards? That depends on how one sees its function and, more importantly, on whether one's view of poverty or of living standards is a 'relative' or an 'absolute' one. Beveridge certainly saw things from an absolutist viewpoint. He designed a basic pension system to provide pensioners with a basic subsistence

minimum income, and saw no need to increase its level as general living standards increased. If, however, the basic pension had risen only in line with prices since 1948, it would currently be worth less than half of its present value — £24 per week rather than £57.60, or nearer 6 per cent of average male earnings than 15 per cent. It is hard to imagine anyone nowadays seriously suggesting that pensioners should live on £24 per week.

If the basic pension does continue to rise only in line with prices, it will eventually reach a value of just 7 per cent of average male earnings by the middle years of the next century. This value relative to general living standards will clearly be inadequate as an income by itself. What should the policy response be?

This depends on a number of factors, not least the role that basic state provision is assigned. Given the existence of both state and private second-tier provision, intended to provide a reasonable degree of earnings replacement for the relatively better off, we take it that the main purpose of basic state provision is one of poverty prevention. It should be there to ensure that no pensioner falls below a level of income that is considered appropriate by the Government and ultimately, through its power at the ballot-box, by the electorate. This is not to say that we believe the only role of the Government in pensions policy is to relieve poverty in old age nor that this is the only role for pensions. Rather, it is that this should be the role of basic first-tier provision. Other aspects of government policy in providing, regulating and subsidising second-tier provision are the central aspects of policy designed to do much more than simply reduce poverty. The question for first-tier provision is how best it can satisfy the role assigned to it.

The first constraint to be taken into account is cost. The basic pension already accounts for around 10 per cent of public spending by itself. To raise it substantially in the short term would be expensive. For example, the proposals of the Labour Party at the last election to increase the single pension by £5 per week and the pension for couples by £8 per week would have cost about £3 billion annually. In the longer term, the ageing of the population, discussed in Chapter 2, would create added difficulties. With more pensioners for every worker, the burden of paying a higher basic pension to all would be greater. Note, however, that with a stable

population it should be possible to increase pensions in line with earnings without placing an increasing burden on the working population. For similar reasons, despite the ageing population, it will actually become easier to afford a pension that rises in line with prices. Before looking at the actual costs of different ways of increasing the pension, it is important to understand these points.

If the same proportion of national income is taken in taxes year by year, then as national income grows, tax receipts will grow and the ability to fund expenditure will grow. With a stable population, therefore, paying for a pension that rises less quickly than earnings would become easier and easier. Paying for a pension that rises with earnings should not impose an increasing burden on taxpayers — the same proportion of their income would be required to finance the pension. In fact, in the UK, the effects of the increasing tax base will more than offset the effects of the ageing population, and continuing to pay the basic pension at its current level relative to prices will become easier. The Government predicts that, taking into account equalisation of pension ages at 65, the National Insurance contribution rate required to finance the basic pension will fall by 3.5 percentage points by the year 2025.

On the other hand, the fact that the population is ageing does mean that it will become more difficult to pay the basic pension if its value is maintained relative to earnings. The tax base will not go up as quickly as the total required expenditure on pensions. NICs would have to increase by an amount of the order of 6 percentage points by 2035 if this policy were to be followed. Hills (1993) estimates that linking the basic pension to earnings would increase its cost from 4 per cent of GDP today to 6 per cent in 2030.

This gives some idea of the costs involved in following particular policies with respect to the level of the basic pension. Note, however, that even were we to invest the extra 2 per cent of GDP in raising the pension level in line with earnings, it would still remain at only 15 per cent of average male earnings, compared with a peak of 20 per cent in the late 1970s. It is probable that should we wish to pursue such a policy, this would be economically feasible, but given the costs and the opportunities for other uses for the money forgone, and the low pension level this would still represent, we need to be clear about whether this

is in fact a desirable policy. If at least this policy is not followed with regard to the basic pension, then other policies need to be developed to provide adequate minimum incomes in retirement.

How good a way of ensuring an adequate minimum for all would a policy of raising the state pension in line with earnings be? To the extent that its current level relative to earnings is adequate, it would work; if its current relative value is not adequate, then it could be raised further until it did represent an adequate income level. All pensioners would see this basic element of their income rising and then keeping up with general living standards. But this in itself is not a particularly useful conclusion. We know that raising the basic pension will make the minimum level of income in retirement higher. But it is costly because all pensioners would receive it.

If all pensioners needed that money in order to reach the required minimum, then that would be the best way of achieving the objective. But we have seen in our discussion of the pensioner income distribution in Chapter 2 that while in the past it may have been close to the truth to say that all pensioners needed the basic pension to reach a minimum level of income, that is no longer the case. The pensioner income distribution is widening, there are more well-off pensioners than previously, and the richest pensioners are a lot better off than the richest pensioners a decade or so ago. Furthermore, with the spread of private provision and the feeding-through of improved coverage and regulation of pensions, this process is likely to continue. Income from the state already forms less than half of the incomes of pensioners and this proportion is likely to fall further over time.

So, raising the basic pension and continuing to pay it to all, though affordable, is expensive and involves giving large amounts of money to people who do not really need it. It would achieve the aim of providing an adequate income for most pensioners, but it would achieve it inefficiently and at considerable cost to workers and possibly the economy. A great deal of the money would be spent not on providing an adequate minimum but on topping up the already adequate incomes of a substantial part of the pensioner population. Alternatively, a higher basic pension might eventually lead to lower savings on the part of many current workers and so lower levels of private income among pensioners

in the future. Furthermore, with contributory conditions and home responsibilities protection not fully covering those with interrupted careers (e.g. part-timers), it would still be far from a comprehensive universal minimum income guarantee.

Providing a pension related in some way to income would get around this particular problem. The reason it might become increasingly desirable to target resources in this way is precisely the widening pensioner income distribution. When deciding on whether a benefit should be contingent only on non-income information, such as age, or income related, one needs to take into account the relative costs of each approach. Universal benefits will be substantially more expensive than income-related ones when a large part of the money being spent on them would go to individuals who would not receive money from the income-related benefit. This occurs when a substantial part of the population to which one wants to get the benefit is not poor. On the other hand, when an identifiable section of the population is overwhelmingly poor, as has been the case with pensioners in the past, there is little to be gained by paying income-related benefits — universal provision makes sense under these circumstances.

For the use of income-related benefits will itself impose costs. Most obviously, benefits whose level depends on incomes and which have to be assessed separately in every case will be administratively far more expensive than flat-rate universal benefits. With benefits that depend on income, there is also always a danger of creating undesirable incentives. When they are paid to individuals of working age, disincentives to work can be caused as high marginal withdrawal rates make extra hours of work relatively unworthwhile. This is not a problem for those over pension age, but effects on incentives to save might be problematic. If higher private incomes in retirement lead to lower state incomes, then the incentive to provide income for oneself is altered.

In fact, it is not clear whether the impact would be to increase savings or to reduce them. There are two countervailing effects. In the direction of reduced savings is the substitution effect — each extra pound of savings over a certain range will be worth less in retirement, so saving becomes less worthwhile. But because total income in retirement would be reduced by increased means-

testing, there could also be an income effect — people need to save more to reach a particular standard of living. The income effect is likely to be most significant for those who would anyway be well off in retirement.

A final important problem with income-related benefits as they now operate is that not all those entitled to receive them actually do so. This is the problem of non-take-up. The DSS estimates that only between 67 per cent and 78 per cent of pensioners entitled to income support receive it, and between 88 and 95 per cent of those entitled to housing benefit receive HB.[1] This lack of take-up is partly a by-product of the complexity of the current benefit system, both the complexity of the entitlement criteria for means-tested benefits themselves and the complexity caused by the existence of both universal and income-related benefit systems. We return to this issue later.

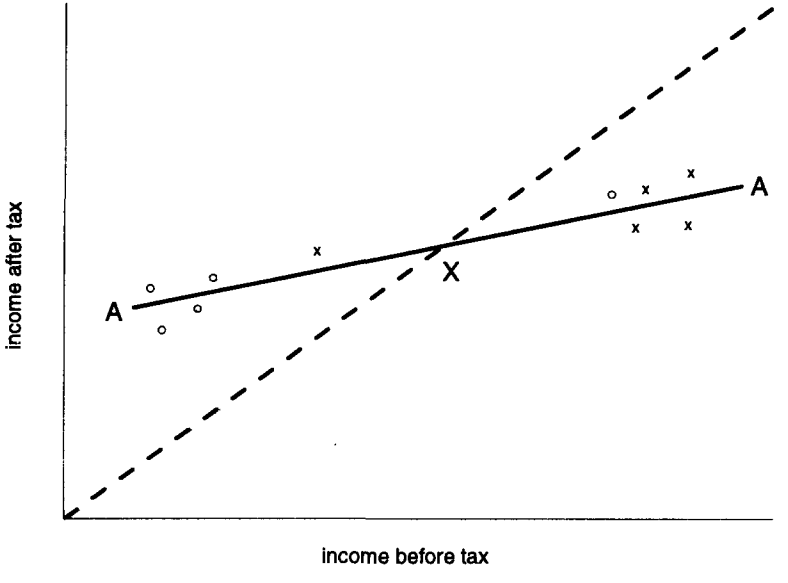
Pensioners as a group remain poorer than the working age population as a group. The incentive problems they might face under particular tax and benefit systems are also rather different. But if all we are interested in doing is ensuring that everyone reaches a minimum living standard, is there any reason for treating the groups differently? In the most pure form of income-related tax and benefit systems, tax payment or benefit receipt would depend only on income and not at all on such characteristics as old age. Such a scheme would operate as illustrated in Figure 6.1. The horizontal axis measures income before taxes and benefits (gross income) while the vertical axis measures income after taxes and benefits (net income). The line AA shows the relationship between these measures of income. At low levels of income, net income exceeds gross income; at higher levels, the relationship is reversed.

The crosses represent the incomes of a relatively well-off group — say working age households — while the circles describe a poorer group, in this case pensioners. Not all pensioners are poor, however; nor are all working age households rich. The tax and benefit system shown in Figure 6.1 treats all pensioners and non-

1. Department of Social Security (1994). See also Fry and Stark (1993).

FIGURE 6.1

Alternative Tax System 1

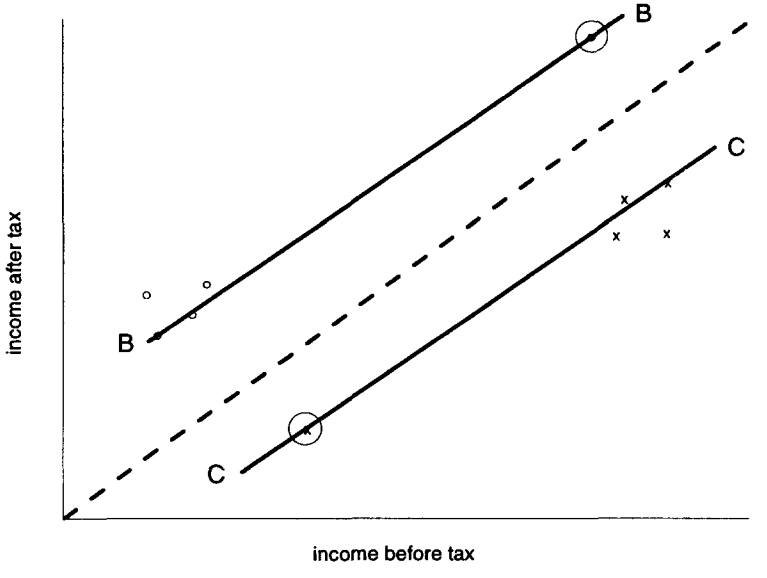


pensioners in the same way and everyone is on the same tax and benefit schedule, AA. The flat slope of AA indicates a high marginal withdrawal rate of income and corresponding disincentive to work. All those with incomes below X receive money, all those with incomes above X pay.

The disincentive to work could be reduced if two separate schedules for pensioners and non-pensioners were introduced. This is shown in Figure 6.2, with BB being the schedule for pensioners and CC that for workers. Whatever their income, pensioners receive the same amount in benefit and workers pay the same in tax. The slopes of both lines are relatively steep so disincentive effects are minimised. The pensioner schedule is just that which follows from payment of a universal benefit like the current state pension. The problem with such a schedule is that the effects on the outliers in each group are rather perverse. The rich pensioner does excessively well, the poor worker very badly. From our point of view, the greater the number of rich pensioners,

FIGURE 6.2

Alternative Tax System 2



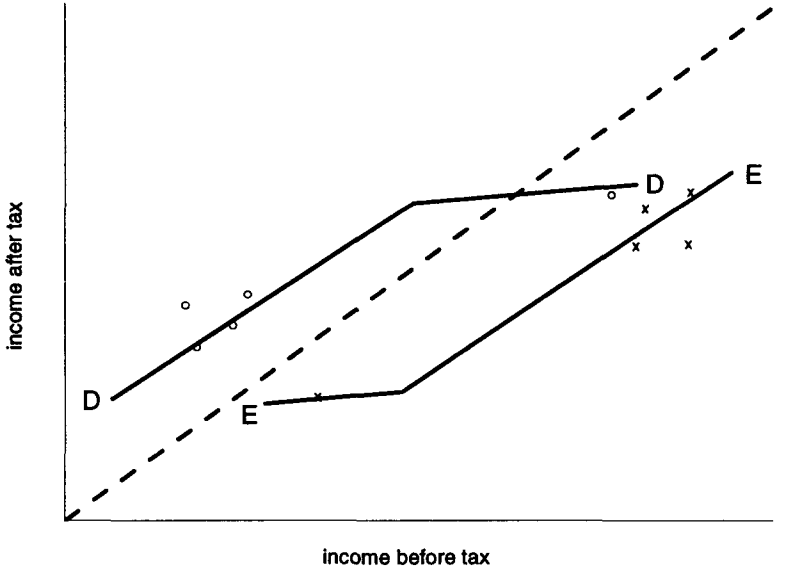
the more there are who do excessively well from a universal pension.

Figure 6.3 shows one possible solution to these problems. By introducing kinks into the two schedules, we can reduce these anomalies in the income distribution without affecting marginal rates for the majority of the population. The price that is paid is the imposition of high marginal rates on richer pensioners and poorer workers.

This schematic representation of a possible 'optimal' tax and benefit system was originally set out in much this form by Dilnot, Kay and Morris (1984) but has recently formally been shown to be an optimal structure by Immonen, Kanbur, Keen and Tuomala (1994). In the broadest terms, what it suggests as a tax and benefit structure for the pensioner population is one in which a benefit is paid to all but is taxed back from those on higher incomes. Of course, it tells us nothing about the level of income at which this taxing back should begin nor the rate at which it should occur. But as the number of richer pensioners increases, the case for

FIGURE 6.3

Alternative Tax System 3



having the high marginal withdrawal rate further down the income distribution becomes stronger.

The costs involved in providing a universal pension, the inefficiency in terms of giving money to those not in need and the increasing heterogeneity of the pensioner population all point away from simply raising the basic pension as a way forward for first-tier pension provision in the UK. Some form of income relation of benefits is likely to continue to be necessary. We now go on to consider how this might work.

RELATING BENEFITS TO INCOMES

We already have a significant part of basic provision for pensioners which is income related with around one-third of pensioners being dependent on some form of means-tested benefits, including around 15 per cent receiving income support. One option, probably the simplest, would simply be to extend the

scope of the current means-tested benefit system by increasing benefit rates further ahead of the level of the basic pension. There are, however, a number of objections to taking this straightforward route.

The first problem is that of take-up. As already explained, income support is not received by a substantial minority of those pensioners who are entitled to it. Relying more on income support in its current form would, therefore, lead to many pensioners not actually reaching the minimum living standards that are trying to be achieved for all. Even low levels of non-take-up would be unsatisfactory if the role given to means-tested benefits were to be expanded, especially if this were at the expense of the universal pension. On the other hand, it is worth saying that take-up is closely related to the level of entitlement — people with high entitlements are much more likely than those with small entitlements to take up the benefit.[2]

The second major objection to means-testing is the effect it might have on incentives to save and the inequities it can introduce between those who have saved enough to provide themselves with a small private income and those who have saved nothing. The structure of income support is such that anyone who has a private pension of just a few pounds a week will gain nothing from it relative to someone who has no such pension and is dependent on income support. If income support were to be given a bigger role, then the range of income over which this would be the case would increase and the severity of the problem would also grow.

There is a serious problem, as well, with the way in which the income support system treats savings held in the form of capital. Anyone with savings in excess of £8,000 is simply ineligible for income support. This creates a very clear incentive in some cases for not accumulating savings or for deliberately running them down or using them for investments, in housing for example, which are not subject to a means test. For those pensioners with savings of over £3,000, their income support entitlement is

2. See Fry and Stark (1991).

reduced by £1 for every £250 in excess of £3,000 that they have. The rate of return that this effectively assumes is in excess of 20 per cent. Those with savings in this range can actually be left worse off than those without any savings, as a result of these rules regarding the valuation of the savings for income support purposes.

For these reasons, we do not believe that simply relying on an increased role for the current means-tested benefit system is an adequate policy. If we want to see benefits for pensioners more closely related to their needs, then we need to consider some of the problems raised and look at ways of overcoming them.

6.2 A Way Forward

The previous section both showed the direct effects of some specific alterations to the means of providing minimum levels of income to pensioners and discussed the issue of redistribution as it applies to pension provision. It was clear from the former that raising the basic pension is not the best way of helping the poorest pensioners even in the current period, and from the latter that raising the basic pension is not necessarily the redistributive policy it initially appears to be.

It is clear that benefits are likely to have to be related to income if the poorest pensioners are to have their living standards raised to a significant extent. With limited resources, and given the relative affluence of a growing minority of pensioners, attempting to support the poorest through a universal benefit payable to all, including the relatively affluent, will prove expensive. But as stated above, relating benefits to income causes problems of its own. Ways need to be found to mitigate the effects of low take-up and of reduced incentives to save and consequent inequities.

It is worth distinguishing the problems that are largely administrative from those that are inescapable in any income-related benefit system. Clearly, the particular way in which income support treats accumulated savings is in no way necessary or inevitable in an income-related benefit. Savings could be ignored entirely (as Atkinson (1994) suggests) or the actual income derived from them could be used as the basis for the means

test. The level of take-up of benefits is also to a large extent a problem of administration. For one thing, the particular structure of the current benefit system, with its dichotomy between universal benefits which are 'earned' through contributions and means-tested benefits which are separate and not 'earned', is likely to be a contributory factor in reducing take-up. Furthermore, it might be possible to make payment of benefits automatic and then claw them back, which would get around the problem of take-up altogether. We discuss this in a little more detail below.

On the other hand, the reduced incentive to save for some individuals and the inequities between those with different amounts of private income are inevitable features of a system that relates benefit level to income. There is no getting round this problem completely, though the effects can be mitigated. Given the uncertainties around levels of income in retirement, from all sources, and the long time horizon involved in saving for pension provision, it is also unclear how great the extent of the problem is.

Part of the solution to the problem of non-take-up might lie in a form of integration of the pension and IS systems. For example, one might combine them into a single benefit, in name at least, called, say, the 'retirement benefit'. Part of this would be non-means-tested and universal, like the current basic pension, whilst part would be income related like the current IS system. On reaching pensionable age, each individual would claim this benefit, just as they now claim the state pension, but in doing so they would make a declaration of income. The non-income-related part of the benefit could then be paid automatically and any income-related part paid on the basis of the income declaration. This declaration would probably need to be made annually to take account of changing income and benefit levels. Subsequent declarations could, however, be relatively straightforward, simply showing how any incomes had changed over the previous year. If details of pensions and their indexation provisions were given on retirement, much of this might be automated.

Such a change might complicate the retirement benefit system administratively for many pensioners. On the other hand, the integration of universal and means-tested benefits would involve

sweeping away the distinction between the two benefits and the complications introduced by the existence of two entirely separate benefit structures. This reform could also play a vital role in ensuring full take-up of benefits.

The second problem, relating to incentives and equity, is more difficult to deal with. To some extent, the importance of these issues will itself be driven by the shape of the pensioner income distribution. If the means test occurs over a range of income in which only a few pensioners would be found in its absence, its negative effects will be relatively small. This implies that the speed of any shift in the balance of means-tested and universal benefits should be determined in part by the speed with which the underlying pensioner income distribution is changing. In addition, the effect of such a means test on savings incentives will, of course, be affected by the degree to which saving for pensions is compulsory. It is currently the case in the UK that all workers earning above the NI LEL have to make contributions either to SERPS or to a personal or occupational pension scheme.[3] To the extent that such compulsory saving covers the gap between universal and means-tested provision, a large proportion of the population will be unaffected by the means-testing as far as their incentive to save more is concerned.

That apart, the most obvious way of at least ameliorating the impact of a means test would be to reduce the rate at which income is withdrawn below the 100 per cent rate, so that all pensioners receive at least some benefit from any income of their own. An alternative solution which could get round some of the problems of means-testing would be to limit the range of incomes against which benefits are tested. Atkinson (1994) has suggested a minimum pension guarantee which effectively means-tests against pension income only and ignores any savings or earnings. This has the attraction of simplicity and certainly would avoid the problems that the IS system has of how savings should be treated. However, it would introduce serious problems of its own. In terms

3. With the exception of women paying the married women's reduced rate of NI contributions.

of equity, it would treat people who have saved in interest-bearing accounts more generously than those who have saved through pensions, and could provide incentives for saving in the former manner. Given the role of pensions in guaranteeing incomes over the whole of retirement, this would be an undesirable effect.

Consider, instead, a system which essentially treats all income equally but which works something like the current family credit system. Any pensioner with income (including the basic pension) below a certain minimum level could receive the full extra benefit. Any income above this minimum would see the benefit payable reduced by a percentage of the difference between the income and the full benefit. For example, suppose the system ensured that anybody with income (including basic pension) below or equal to the basic state pension received a benefit to take that income to £75 (£17.40 above the single retirement pension as at April 1994) with a 70 per cent withdrawal rate on higher incomes. Then anyone with income above the basic pension level could receive a benefit equal to £17.40 minus 70% of X, where X is the amount of income above the basic pension level. (Again, this is purely illustrative; this change introduced immediately would be quite expensive.) Thus while pensioners within this income range would see less than the full benefit of their earlier saving, they would at least see some benefit relative to those not saving.

Table 6.1 illustrates how this would work. In the left-hand column are original incomes, including the universal basic pension. The second column shows how much income the pensioners have above the basic pension, the third how much income-related benefit they would receive, and the fourth column shows final income after receipt of the income-related component of the benefit. For each £5 increase in original income, final income rises by £1.50 — 30 per cent of the increase in original income.

This is just one possible framework indicating a way of containing social security expenditure on pensioners whilst improving the living standards of the poorest pensioners. To make more widespread income relation of benefits feasible, a change in the administrative structure of retirement benefits would be required, with income-related and universal elements being calculated and paid simultaneously. To make it equitable, a

TABLE 6.1

Original and Final Incomes in an Integrated Benefit System with a 70 per cent Taper

Original income	*Excess over basic*	*Income-related addition*	*Final income*
£57.60	£0.00	£17.40	£75.00
£60.00	£2.40	£15.72	£75.72
£65.00	£7.40	£12.22	£77.22
£70.00	£12.40	£8.72	£78.72
£75.00	£17.40	£5.22	£80.22
£80.00	£22.40	£1.72	£81.72
£85.00	£27.40	£0.00	£85.00

change in the structure of the income-related benefits themselves would be necessary, with the introduction of a rate of withdrawal of less than 100 per cent over a certain band of income. Any such system could, of course, maintain, and might well extend, the age-related parts of the current benefit system.

The introduction of any reform along these lines would itself be a long-drawn-out process, much as the current Government's policy of moving the IS line above the pension and letting the pension fall over time relative to earnings is a gradual process and long-term strategy. Gradual increases in the scope of income-related benefits need not imply large increases in the numbers reliant upon them. There are currently fewer pensioners receiving income support than there were receiving supplementary benefit in 1979, despite higher levels of IS relative to the pension. This is a direct result of increasing pensioner incomes from other sources, including SERPS.

The non-means-tested part of the system might be built on the basic pension continuing to be paid at its current real level relative to prices, which, as we saw, will actually result in a falling burden on resources because of growing earnings, despite demographic pressures. More money could be released to increase the minimum benefits available if the basic pension were under-indexed relative to price inflation. One per cent under-indexation could provide

around £$^1/_4$ billion per year to add to income-related benefits. This would, of course, leave those pensioners just above the ceiling for income relation worse off than they would otherwise have been. The degree to which the real value of the pension is eroded, if at all, and to which means-testing becomes relied upon would inevitably be a difficult decision, and one that will depend upon the way in which the pensioner income distribution develops in the future.

This policy debate cannot take place independently of government decisions about the provision of earnings-related pensions, either by the state or, more likely, through government encouragement of private pension provision. Neither the basic pension nor any income-related supplement is ever likely to provide a good level of earnings replacement except for those who have experienced very low pay, and it must be a vital part of policy to encourage the private provision of retirement income by the greatest possible proportion of the population. In this way, the recent sizeable increases in pensioner incomes could continue and a better rate of earnings replacement be provided.

Nevertheless, it will remain the role of government to provide an adequate standard of living, given economic and political constraints, to those pensioners with little or no income of their own. Until recently, universal provision of the basic pension was seen as the best way of doing this. Now that many pensioners have high incomes of their own, and given demographic pressures, it is no longer easy to argue that universal provision is the most effective way of maintaining the incomes of those in need. A system that combines income-related benefits with mechanisms to ensure that they are received by those who need them may prove to be the only way of making significant improvements in the living standards of the poorest pensioners.

CHAPTER 7

The Future of Supplementary Pension Provision

7.1 Introduction

The changing structure of private pension provision raises numerous questions about future trends in the provision of supplementary pensions and about the role of the state in their provision, promotion and regulation. In this chapter, we start by looking in more detail at the shift that has occurred from defined benefit pensions to defined contribution schemes and at the consequences this might have for the levels and distribution of retirement incomes.

The most obvious ways in which the Government currently affects private pensions are through the regulations for contracting out, the provision of the contracted-out rebate, the rules for receiving tax reliefs and the structure of those reliefs. In the second part of this chapter, we look in detail at the terms of contracting out and the contracted-out rebate, and at the ways in which its structure affects the private pension sector. We go on to look at a number of other policies which the Government, and the private sector, might pursue to affect the provision of supplementary pensions.

7.2 Defined Contribution vs. Defined Benefit Pensions

In the UK, there has been a rapid growth in the coverage of defined contribution schemes in recent years. This growth was

outlined in Chapter 2. The proportion of private sector employers' plans choosing this formula increased slowly from 1971, but the largest change has occurred since these schemes were permitted to contract out of SERPS in 1988, doubling the proportion covered by a defined contribution scheme. But the biggest shift from defined benefit to defined contribution plans was a result of the substitution of personal pensions for SERPS. In 1991, 62 per cent of those with some private pension provision were in defined benefit schemes, with 33 per cent in personal pensions and 5 per cent in group defined contribution plans.

Such changes have not been confined to the UK. In the US, for example, the proportion of the work-force whose primary pension plan had a defined contribution formula doubled between 1983 and 1989,[1] and since 1975, 80 per cent of newly covered workers have joined defined contribution schemes.[2] The proportion with a primary defined benefit plan fell from 78 per cent in 1975 to 64 per cent in 1989, and is projected to fall to 51 per cent in the year 2000. Although this is a dramatic transformation, only a few firms have switched from a defined benefit to a defined contribution scheme. The change mainly arises from the shift from large-scale, unionised manufacturing to other sectors. Even so, other forces may be at work: for example, the increasingly onerous regulatory structure for defined benefit schemes.[3]

We noted above that there is a widespread view, both among commentators and among employers, that defined benefit pensions are 'best'. Firms also may have special reasons for choosing a defined benefit formula, particularly if they wish to reduce employee turnover. However, employees do not appear to favour one type of pension provision over another; the main advantage of defined benefit occupational schemes cited was that the 'employer contributes'.

These 'defined benefit is best' attitudes contrast with the results of economic analyses. Bodie, Marcus and Merton (1988)

1. Samwick and Skinner (1993).
2. Turner (1993).
3. Kruse (1991), Gustman and Steinmeier (1992) and Papke (1992).

provide an economic model of uncertainty in different types of pension plan, which Brugiavini, Disney and Whitehouse (1993) extend to look at job tenure uncertainty.[4] In a theoretical framework where the expected pay-off to the two types of plans is identical, defined contribution (DC) plans may nevertheless be preferred to defined benefit (DB) plans. These different types of plans insure against different types of risks: DC plans against earnings and job tenure uncertainty; DB plans (as usually established) against capital market uncertainty. But since appropriate portfolios could in principle be devised in DC plans to insure against certain kinds of capital market uncertainty, the widespread perception that, overall, DC plans are more 'risky' may not be warranted. Furthermore, as Bodie et al. point out, defined contribution schemes can be devised to mimic many of the effects of a defined benefit plan; for example, back-loading effects can be derived by tilting the contribution schedule with age. Kotlikoff (1988) concludes his comment on Bodie et al., 'While the authors are cautious, one is left with the impression that the defined contribution form of pension plans is superior in many, if not all, respects to the defined benefit form. I certainly concur with that conclusion.'

Economic theory therefore clashes with the widespread view that defined benefit plans are superior.

EMPIRICAL EVIDENCE

Our discussions so far have made it clear that defined benefit and defined contribution schemes will provide different benefits for different people. We look here at evidence as to their relative performance on average and between different groups of the population.

Recent work in the US by Samwick and Skinner (1993) has suggested that as many as 90 per cent of contributors to defined benefit schemes would in fact have been better off by putting their money into defined contribution schemes. Only the 10 per cent of

4. See also Green (1985).

contributors with the highest pensions from the defined benefit schemes would have been better off remaining in them.

This result is surprising and in fact rests on a number of particular assumptions that the authors make. They neither impose an assumption of self-financing within the defined benefit schemes — and so could be confusing the intra-generational redistribution with inter-generational redistribution — nor do they assume that defined contribution and defined benefit schemes earn the same rate of return on investments. So their surprising results could just reflect either the lack of a self-financing assumption or a higher rate of return on defined contribution schemes. In either case, the true intra-generational distributional consequences of defined benefit and defined contribution schemes as such are masked.

To overcome these problems, it is possible to impose self-financing and equal rate of return restrictions. Using UK data from the 1988–89 Retirement Survey, this is precisely what we do. For each of over 3,500 recorded individual spells spent contributing to a defined benefit pension scheme, the pension earned is predicted. Given the self-financing assumption, the combination of the contribution rate, assumed to be a constant proportion of earnings, and the rate of return on investments must provide the right amount of money at the end to pay the promised pensions. Assuming a 4 per cent real rate of return, the contribution rate is automatically determined. These contribution and investment rates are then applied to a defined contribution scheme and, on the basis of this and information regarding age, sex and earnings history, the pension that would be earned by each individual through a defined contribution scheme is calculated, and can be compared with the pension earned from the defined benefit scheme.

One final key assumption is that preserved benefits (that is, benefits retained by those who leave their pension scheme before retirement) are uprated in line with statutory provisions in force over the time period since the spell was completed. Since 1985, these benefits have been uprated in line with inflation up to a maximum of 5 per cent per annum (the GMP component is treated differently). It should be noted that between 1968 and 1982, inflation exceeded 5 per cent in *every* year (in a period when there

was no uprating at all), but that even since 1982, inflation has exceeded 5 per cent in half the years.

The main findings of our research can be summarised:[5]

(i) For all the main types of defined benefit plan formula observed in practice, there is a wide variation between an individual's projected benefits obtained from the DB plan and the benefits obtained were equal contributions to have been invested in a DC plan. Take as an example a DB plan in which the individual retired at age 65, the accrual factor was $^1/_{60}$th, scheme benefits were not fully uprated post-retirement in line with inflation and the plan was integrated with social security. Our projected mean pension value per spell would be £9,300 with an equilibrium contribution rate of 5.1 per cent. However, the mean absolute difference across individuals in benefits between the DB and DC plans would be £7,078: a substantial difference.

(ii) In looking at the distributional effects, a clear majority (three-fifths of the total sample) would have had higher projected benefits had the plan been of a DC type rather than a DB type. The reason for this (confirmed by the relatively small mean pension benefit value per spell) is that most individuals did not have long tenures in their pension schemes: an average of just over 10 years among the Retirement Survey sample. Consequently, many of them had preserved benefits which, as we have seen, will have been incompletely indexed to inflation. In effect, incomplete uprating of preserved benefits skews the distribution of benefit towards the minority of individuals who complete their pension scheme tenures to retirement. This is, of course, exactly what the models of the incentive effects of final earnings defined benefit pension plans outlined in Section 3.4 would predict.

(iii) A more detailed focus on the distribution of projected benefit entitlements suggests that plan participants at

5. For further details, see Disney and Whitehouse (1994b).

the first decile (from the bottom), at the first quartile and at the median are all better off in a DC plan. Above the average (mean), the picture varies according to the structure of the DB plan: for example, whether it is integrated with social security.[6] Typically, and not surprisingly, longer pension scheme tenure is associated with a greater probability of being better off in a DB plan. Higher lifetime earnings also enhance this probability. Lower-earning women are disproportionately better off in a DC plan relative to a final salary DB plan both because of shorter job tenures and because of the impact of factors such as integration with social security. For the 10 most common types of DB plans observed in the Government Actuary's Survey of Occupational Pension Schemes, the proportion of men better off in a DC rather than a DB plan varies between 57 and 69 per cent; for women, the range is between 52 and 66 per cent.

(iv) A key determinant of the results is whether preserved benefits are uprated in line with price inflation. With no uprating at all (the pre-1985 position in the UK, and the position in the US), the distribution of projected DB benefits becomes even more skewed. Conversely, when preserved benefits are fully indexed to price inflation and DB benefits are less skewed, the proportions better off in the two types of scheme become roughly equal, which is perhaps the prior expectation.

A reminder of the key assumptions behind these results is useful: the simulations assumed that each individual is permitted to make an equal value of contributions into the two kinds of plans, that transactions costs of the two kinds of plans are equal, and that no allowance is made for the potential uncertainty surrounding the streams of benefits from the two types of plans.[7]

6. Integration results in an occupational pension replacement rate that rises with earnings, in effect reversing the redistribution of the state system between plan members. The regressivity of integration is criticised in Munnell (1984) and Ghilarducci (1992).

Furthermore, they do not preclude the possibility that particular individuals might be better off in another type of plan altogether: for example, one which averaged over all lifetime earnings and made adjustments for periods out of the labour force, such as SERPS. Finally, other salient features of typical DB plans, such as early retirement ill-health provisions, are ignored. Nevertheless, the crucial conclusion remains: that the typical DB plan formula biases the distribution of benefits toward (in general) a minority of plan participants. At the most basic level, a majority of plan participants, via their contributions, subsidise a few. This privileged minority will exhibit longer tenures and higher salary profiles (especially final salary). They will typically be better off and male.

CONCLUSION: REDISTRIBUTION IN DEFINED BENEFIT PLANS

Occupational pensions imply a substantial degree of redistribution of income from short- to long-tenured individuals and from low to high earners compared with a regime in which people paid and/or received from their employer a constant percentage of their earnings into their pension fund. Since our model of earnings is deterministic, we have not taken account of stochastic fluctuations which would increase the degree of redistribution, nor of effects such as low pay as a result of ill health when near to retirement. Some commentators have gone further and point to deliberate manipulation to redistribute benefits further. For example, managers may award themselves a large pay rise in their final years of employment, increasing the base on which their pensions are calculated.[8] Anecdotal evidence from one large scheme suggests that employer contribution rates are between 10 and 20 per cent for the majority of staff, rising to nearly 30 per cent for senior executives and well over 50 per cent for directors. These high levels of pension benefits will result in

7. All these points are discussed elsewhere in the text.
8. Riley (1992).

the massive redistribution evidenced above in any firm with steeply tilted pay profiles for long-serving members of staff who reach higher-paid positions.

7.3 Private Pensions: A Role for Government

The analysis of uncertainty and its effect on pension benefits in Chapter 5 showed that different types of pension currently offer different types of insurance, and that some are especially exposed to certain forms of risk. Of particular concern was the direct link between capital market uncertainty and defined contribution pensions, and the effect of job tenure and earnings uncertainty on defined benefit pensions. Can the Government encourage the provision of insurance against these risks? A related concern was the existence of market failure in many areas of pension provision. Informational asymmetries between individuals and pension providers can lead to adverse selection and principal–agent problems. Can the Government intervene to restore economic efficiency?

In this section, we consider four forms of government intervention in the private pension market. First, we look at the contracted-out rebate: its role, how large it should be and the case for targeting the rebate. Next, we look at the preservation of pension rights for early leavers. The third area we consider is employer contributions to individuals' personal pensions, and finally we look at ways of insuring against capital market uncertainty.

We do not consider the issue of pension fund regulation, in which there has been a great deal of interest since the Maxwell débâcle, in part at least because many of the relevant issues are detailed ones of law and finances rather than of economics. Nevertheless, it should be borne in mind that the state's role as regulator is an extremely important one.

THE TERMS FOR CONTRACTING OUT OF SERPS

The object of the contracted-out rebate is to allow private pension plans to finance a benefit in the future equivalent to the

guaranteed minimum pension (GMP) which the pension plan member forgoes as a condition of contracting out of SERPS. The Government Actuary recommends a new level for the rebate every five years in the light of changing economic conditions and the slow maturation of the SERPS and contracting-out regime. The method is described in detail in Appendix 7.1.

To calculate the rebate, the GMP must first be estimated, requiring an assumption of future earnings growth in the economy. Accrual of GMPs varies between cohorts due to accelerated accrual of GMPs along with SERPS, and the cut in the GMP as with SERPS in Social Security Act 1986. The earliest cohorts covered accrued 1.25 per cent of earnings for each year in the scheme, falling to less than a third of that level for the youngest cohorts. Since the rebate is the same proportion of earnings for all cohorts and accrual rates differ, the cost is averaged across all members of occupational pension schemes.

Since the Government is paying compensation now for a benefit provided well into the future, account needs to be taken of investment returns between now and reaching retirement. Again, the GMP is cheaper to finance for younger workers, this time because of compound interest effects.

Thus, the rebate needed to compensate for the GMP is higher, *ceteris paribus*, the higher the expected future growth of earnings, the lower the rate of return and the lower the accrual of GMP (in effect, the younger the pension plan member). Sensitivity of the rebate to returns and earnings growth is shown in Table 7.1. The current rebate of 4.8 per cent was calculated by the Government Actuary's Department assuming a 2 per cent difference between the real return and earnings growth.

The rebate offered to members of personal pensions is the same as that given to those in occupational schemes, with the exception of an additional 1 per cent 'incentive' reduction for those aged over 30. Of course, personal pension optants are not guaranteed to receive the GMP, although insurance is provided by the minimum contribution to the scheme, as well as the incentive rebate.

From the point of view of the state, contracting out is a way of funding part of its own obligations through the private sector: it gives up contribution income now in return for future savings on pensions expenditure. This is 'funding' in the technical sense:

TABLE 7.1

Neutral Contracted-Out Rebate for 1993–94, by Rate of Return and Earnings Growth

Per cent

Rate of return	Earnings growth				
	1%	*2%*	*3%*	*4%*	*5%*
1%	7.9	8.6	9.3	10.1	10.7
2%	6.4	7.7	7.9	8.6	9.2
3%	5.0	5.8	6.5	7.2	7.8
4%	3.7	4.5	5.8	5.9	6.5
5%	2.6	3.4	4.1	4.8	5.4

Note: See Disney and Whitehouse (1992a, 1993c) for details.

substituting the funded GMP for a large proportion of the PAYG or unfunded liability to pay SERPS. From the point of view of the pension provider, the rebate is effectively a means of borrowing from the state.[9] The terms of this transaction depend on the real rate of return and, given the shared indexation of the GMP post-retirement, the nominal rate of return.

So as to ensure the GMP is covered, there is a natural tendency for the Government Actuary to err on the side of caution, to provide a rebate that is able to finance the GMP under rather pessimistic, but plausible, assumptions. The latest review assumed that real returns will be 2 per cent above earnings growth, compared with $1^1/_2$ per cent in previous reviews. Furthermore, both with the original introduction of SERPS and GMPs in 1978 and with the development of personal pensions following Social Security Act 1986, a clear if implicit aim of the Government has been to maximise the proportion of occupational schemes and individuals that choose to contract out of SERPS. Chapter 2 showed that some 80 per cent of those eligible to do so

9. Hemming and Kay (1981b).

were contracted out in 1991, including 90 per cent of those in occupational pension schemes.

From the point of view of the state, a negative real return on the rebate (a direct reflection of the positive return enjoyed by the private sector) could be justified if intertemporal or inter-generational considerations warranted the transfer of expenditure from the future to the present. For example, the state might reason that with the ageing of the population, it would be harder to raise revenue in the future, as significantly higher tax rates would be required to meet PAYG pension liabilities. The rebate would alleviate the constraint in so far as private pension providers would pay back their 'loans' in the form of providing the GMP. However, it is hard to see how very large implicit transfers between time periods can be justified on these grounds alone.

Occupational schemes differ in their mix of age-groups and ratio of pensioners to contributors, and incremental returns to individuals' personal pensions vary widely with age (Section 4.3). Setting the rebate at a level reflecting the average accrual of GMPs for people in occupational schemes will involve a large intra-marginal subsidy to schemes and individuals with relatively favourable characteristics (men and the young). Going further and setting the rebate at a level that maximises the proportion contracting out increases the size of these subsidies still further. The real and nominal outcomes for the return during the 1980s have enabled the 'representative average' occupational pension scheme to use the rebate to pay benefits more generous than the GMP for which it was intended. In similar vein, the 'typical' personal pension optant (who is relatively young — Section 2.3) could in principle obtain a return from investing the rebate often far in excess of that from remaining in SERPS.

This facet of contracting out in relation to occupational pension schemes can be studied using similar simulation methods to those described in Section 3.2 to look at individual returns to the state pension. Comparing the pension entitlements of SERPS members with those of contracted-out individuals, assuming earnings growth factors and real returns similar to those employed by the Government Actuary, showed that the returns to the contracted-out members average between 0.5 and 1 per cent a year more than those to SERPS members.[10] This reflects the fact that the value

of the rebate is determined by the average accrual of SERPS for the population as a whole. All those retiring after the 1998–99 peak in the generosity of SERPS therefore receive for part of their working life a rebate in excess of the SERPS forgone, and this will continue until SERPS reaches maturity.

Furthermore, the ability to self-select into contracted-out or contracted-in status (particularly since the advent of personal pensions) means that those with low returns from the state scheme are able to opt out, raising the equilibrium contribution rate for those remaining in the state scheme. This 'creaming-off' of good risks by the private sector (such as men and those with a stable pattern of employment histories) leads to an adverse selection problem, with state provision increasingly concentrated on the high risks (women, older workers, those with interrupted employment etc.).

Given that many individuals are likely to receive high returns on their contracted-out rebate, relative to remaining in SERPS, it is reasonable to ask what function is served by retaining it. Simply abolishing the rebate would, of course, imply a redistribution from individuals in the private pensions sector towards those remaining in SERPS. Joining a private pension scheme would then only be justified if the excess yield of the real return over earnings growth was large; even so, many individuals with a basic pension, SERPS and a private pension may well consider themselves over-annuitised.

TARGETING THE CONTRACTED-OUT REBATE

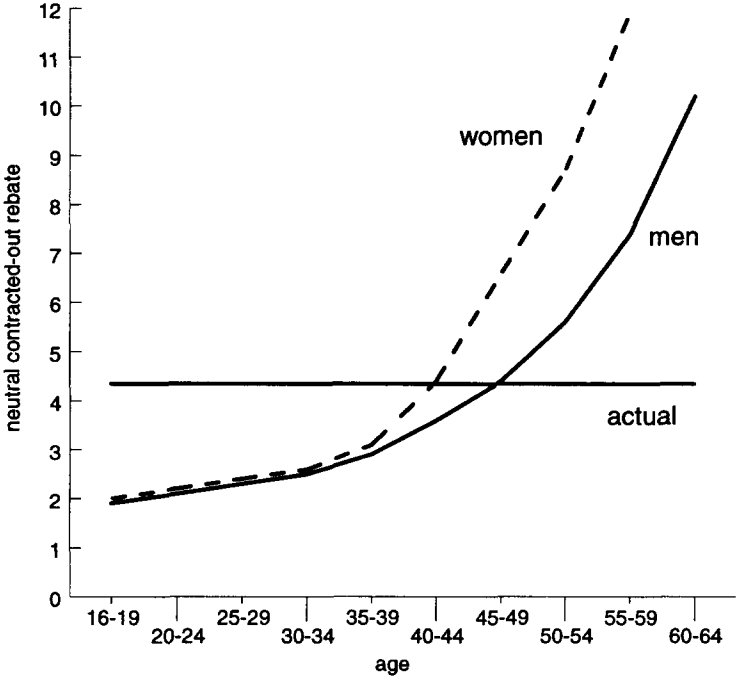
In Section 4.3, we showed the large returns open to younger individuals from taking out a personal pension. Investing just the rebate for contracting out in a personal pension rather than joining SERPS resulted in a pension as much as three times larger, on reasonable assumptions about real earnings growth, the rate of return and transactions costs. Between 1988–89 and 1993–94, rebates to personal pensions cost the Government

10. Disney and Whitehouse (1993a).

around £9 billion in National Insurance revenues forgone. The eventual savings from SERPS pensions in the future, discounted back, were estimated at just £3 billion. This large net cost of £6 billion over the period stemmed from paying a rebate appropriate for the average occupational pension scheme members, to younger workers for whom SERPS is relatively less valuable due to compound interest and the reduction in accruals, as well as the 2 per cent incentive rebate paid on top for these five years.

FIGURE 7.1

Neutral Contracted-Out Rebate, by Sex and Age



Note: Calculated for women assuming equalised pension age at 65 as announced in Department of Social Security (1993b). Arrangements have not been announced to take account of equalisation effects on SERPS and contracting out. Here, we assume that GMPs accrued by women at male accrual rate.
Source: Authors' calculations and Government Actuary (1992). See also Disney and Whitehouse (1992a, 1993c).

A way of eliminating this intra-marginal subsidy is to relate the contracted-out rebate directly to the cost to the individual in pension benefits from contracting out. Since women live longer than men, they need larger rebates to finance the same level of pension. Women currently aged over 44 will qualify for the GMP at age 60, so the difference between men's and women's accrual is much larger now than it will be when pension ages are equalised. Women currently under 39 will retire at 65. The required rebate is closer to that for men.

Figure 7.1 shows the extent of the intra-marginal subsidy to younger individuals. When the rebate curve is below the line, the rebate is worth more than the SERPS forgone; when the curve is above, the individual or pension fund is under-compensated.

Whilst the contracted-out rebate was available only to defined benefit occupational pension plans, the fact that contracting out benefits younger workers relative to old did not particularly matter to the Government's finances, since few occupational pension schemes were contracted in. With the advent of personal pensions, an adverse selection problem results: younger workers gain substantially from contracting out. In Section 2.3, we showed that it was indeed these beneficiaries who took out personal pensions. By relating the rebate to age, these intra-marginal subsidies would be eliminated, and the exchequer cost of the rebate would move into line with the gain to the exchequer in reduced SERPS liabilities in future. A second effect of paying higher rebates to older workers is that many of those currently in SERPS will for the first time find a contracted-out personal pension an attractive option. This would extend pension choice to a larger portion of employees.[11]

11. The Government has announced its intention to relate the rebate more closely to age from 1996–97, but the exact structure has not been determined.

PRESERVATION OF RIGHTS FOR EARLY LEAVERS

Prior to 1975, an individual leaving a pensionable job before retirement had no right at all to receive a pension. In many schemes, entitlement was limited to a refund of the employee's contribution, with few schemes even offering accrued interest. Without preservation, therefore, the majority of individuals joining a pension scheme, who leave before retirement, would lose their pension benefits. Since 1975, some preservation of benefits has been required, and the terms have gradually been improved. The vesting period was reduced from five to two years in 1988, and in 1985 limited price indexation of preserved benefits was introduced. Some degree of preservation, then, is necessary, but it is not apparent what is the fairest method, and the previous section showed that the degree of redistribution between individuals with different earnings paths and tenures was highly dependent on the preservation rules.

The current limited price indexed preservation still means retirement income is vulnerable to an inflationary episode between leaving a scheme and retirement. As we noted above, inflation has exceeded the ceiling for limited price indexation in every other year in the past decade. The main objection espoused to full indexation of preserved pensions appears to be that 'during periods of high inflation real investment returns may be negative'.[12] However, high inflation is neither a necessary nor a sufficient condition for negative real returns; indeed, the economy has experienced both periods of low inflation and low returns, and periods of high inflation and high returns. Further, the existence of inflation-hedging investment strategies and index-linked securities means that pension funds can invest to avoid inflation risk.

It would be possible to provide further protection for early leavers, for example through requiring indexation of preserved pensions to average earnings rather than to inflation. However, this might shift the balance of advantage in the opposite direction.

12. Pension Law Review Committee (1993, p. 297).

At any time, the growth in average earnings reflects the growth of individuals' pay averaged across the economy, adjusting for the entry of new cohorts, exit of old cohorts and compositional effects due to unemployment. At some points in the life cycle, most likely when old, average earnings in the economy are likely to outstrip individual earnings, whilst at other points, individual earnings will grow more quickly. So with preservation in line with economy-wide earnings, some early leavers may do better than some who stay in the pension fund.

The current procedures for uprating preserved pensions leave benefits subject to inflation risk, but going beyond full indexation to prices might result in some over-compensation for people leaving defined benefit pension plans.

EMPLOYER CONTRIBUTIONS AND DEFINED BENEFIT VS. DEFINED CONTRIBUTION PENSION PLANS

The comparison between defined benefit and defined contribution pension plans made at the beginning of this chapter does not represent the actual pension choices facing individuals. We assumed *equal* contributions to the defined benefit and defined contribution regimes in aggregate. In practice, just 5 per cent of private sector employers and 2 per cent of public sector employers will pay into a personal pension on behalf of their work-force.[13] Further, many employers will not allow certain non-pension benefits to workers who are not covered by the pension scheme. For example, only 38 per cent of private sector and 8 per cent of public sector schemes will provide life insurance cover for workers who opt not to join the scheme. Thus, in the majority of cases, opting not to join an employer's scheme gives the worker control over where the employee's contribution is invested, but not the employer's.

In most schemes, employer contributions tend to be larger than those levied on employees (in the absence of contribution holidays

13. National Association of Pension Funds (1994).

etc.). In 1991, employers contributed £7.4 billion to pension funds, and employees £3.3 billion. Individuals who opt not to join an employer's scheme in most cases will not receive a contribution from the employer, worth on average 70 per cent of the pension value to those who join the scheme. It is not surprising, then, that the most frequently cited advantage of occupational plans in surveys of employees' attitudes to pensions was that the employer contributes.

In Section 3.4, we argued that pensions cannot be viewed simply as a bonus on top of earnings. Ultimately, the employer's contribution must be borne by employees in the form of a lower wage than in the absence of the employer's contribution. In that case, employees should be able to bargain successfully for a higher wage to pay for their own annuity if they do not join an occupational pension, or persuade their employer to contribute to a personal pension.

Why has this rarely happened? One reason is probably the understandable reluctance on the part of employers who voluntarily provide a pension scheme to contribute to another one. A second is that employers may have reasons for providing their own pension plan, such as generating labour market incentives, for example to reduce turnover. The final reason was illustrated by the analysis in the previous section. Defined benefit plans result in a substantial degree of redistribution, particularly favouring long stayers and high earners. If the losers from this redistribution were able to invest the employer's contribution in a personal pension, then this would have significant implications for the scheme's finances. This is another form of adverse selection. Rather like the case of personal pensions vs. SERPS, if the losers leave the scheme, then the cost of providing the scheme rises. Membership of the pension plan becomes increasingly concentrated on those expecting long tenures and with high earnings. People might also engage in switching strategies between schemes which are optimal at different points in the life cycle. Few employers, for example, will allow readmissions to the pension scheme.[14]

Employers may have a number of reasons for not contributing to their employees' pensions outside the firm's plan, but the tying of employer contributions to defined benefit pension plans for a

substantial proportion of employees is a significant restriction of individual choice. Occupational pension benefits are subject to a good deal of uncertainty over future job tenure and individual earnings. To a significant degree, they involve the employee putting all of his or her 'eggs in one basket', since both income whilst working and that in retirement are dependent on these uncertain outcomes. One way forward would be to compel employers to contribute to their employees' personal pensions rather than solely to their occupational scheme. Eventually, such proposals might lead to compensating changes in wage structure and the offer of alternative pension arrangements by employers. These changes would make the compensation package more overt and would increase competition in pension provision to workers covered by occupational schemes, by extending the individual's choice to the employer's as well as the employee's contribution. In the current legal framework, however, the concept of an employer's contribution on an individual's behalf is somewhat arbitrary and is very difficult to define at all satisfactorily.[15] Furthermore, there may be a problem of adverse selection, as younger workers invest the employer's contribution elsewhere, whilst older workers stay with the defined benefit scheme. But it is not clear why making the redistribution inherent in defined benefit occupational pension schemes more transparent is necessarily a bad thing. Many of the features of defined benefit schemes — favouring older workers, those with long tenures and high earnings, for example — can be replicated in a defined contribution model by suitable tilting of the contribution profile. Perhaps the most convincing objection is that this would merely exchange the risk derived from earnings and job tenure uncertainty for a different type of risk — capital market returns — and it is to this that we now turn.

14. One-third of private sector and 15 per cent of public sector employers will allow them (National Association of Pension Funds (1994)).
15. Pension Law Review Committee (1992).

CAPITAL MARKET UNCERTAINTY AND PENSION INSURANCE

Defined contribution plans are unlikely to be attractive to all segments of the population, even if the contracted-out rebate is adjusted to reflect fairly the level of SERPS pension forgone, because of their exposure to capital market risk. Indeed, a typical view among pension commentators is that defined contribution pensions are inherently more risky than other forms of provision.[16]

There are a number of ways in which these risks could be ameliorated. First, the statutory requirement that the protected rights pension be converted to an annuity on reaching state pension age leaves the pension benefit vulnerable to the market valuation of the pension fund assets and the annuity rates pertaining at retirement. Some flexibility in when it is possible to purchase an annuity with the protected rights component would add to the insurance possibilities already available, such as switching to less risky assets closer to retirement.

A second approach is to move along the continuum towards a defined benefit type plan. Although some employer-provided defined contribution plans offer some guaranteed minimum level of benefit, this hybrid type of scheme is not nearly as common as in the US, where some large employers (for example, Xerox) have offered so-called 'floor plans'. In the case of personal pensions, there is no employer to underwrite these capital market risks. One insurance possibility is to lock in some proportion of the benefit earlier on for a guaranteed pension level. This is equivalent to purchasing a deferred annuity with inflation protection. However, the market for these types of product is very small, and mainly involves deferred annuities purchased on the winding-up of an occupational scheme. An alternative would be a 'target benefit' approach, taking advantage of the flexibility of contribution levels in defined contribution schemes. The way such a scheme might operate is akin to the 'balance of costs' method of financing defined

16. For example, Davies and Ward (1991).

benefit occupational plans, with periodic adjustments to contribution rates to achieve a target pension level.

As the size of the sector grows, there can be no doubt that defined contribution plans need to devise strategies to minimise risk, without unacceptable consequences for returns, and this may require the development of a broader range of financial instruments.

Appendix 7.1 Determining the Level of the Contracted-Out Rebate

The aim of the rebate is to provide pension plans now with sufficient funds to finance payment of the GMP in the future. The cost of providing the GMP for a year of an individual's working life is

$$\text{(7A.1)} \quad \dot{P}_t = (W_t - \text{LEL}_t)\frac{Y_R}{Y_t} x'_{Rt} A_R (1+r)^{R-t}$$

where $\dot{P}$ refers to the marginal pension earned that year, W_t is earnings capped by the UEL, x' is the GMP accrual factor and A is the annuity factor, taking account of limited price indexation of the GMP. The first part of the equation (the term in wages and the LEL) is the value of the GMP itself. The annuity factor turns this into a lump-sum cost at the age of retirement, and the term in the interest rate discounts back to the current year, reflecting the investment returns earned between when the rebate is given and when the GMP must be paid.

To work out the level of the contracted-out rebate, the Government Actuary estimates the value of the current GMP from (4A.2) and equates it with the value of the rebate, which is simply a proportion of earnings net of the LEL. These costs of the GMP to individuals (which vary with age and earnings) are then averaged across the people who are members of contracted-out occupational schemes. Solving for the contracted-out rebate, the equation simplifies, since the term in earnings net of the LEL cancels out of each side, giving

$$(7A.2) \quad c_t = \frac{1}{N} \sum_{i=1}^{N} \frac{Y_r}{Y_t} x'_{Rt} A_R (1 + r)^{R-t}.$$

The rebate therefore depends on assumptions as to the future growth rates of earnings (Y) and investment returns (r), annuity rates (A) and, critically, the average value of the GMP accrual rate of occupational scheme members (x').

Recalling Table 4A.2 in Appendix 4.2, the GMP accrual rate in turn depends on the year in which the individual will reach state pension age: older cohorts earn accelerated accrual to the GMP; younger cohorts had their entitlement cut further by Social Security Act 1986. Over time, therefore, the rebate is projected to fall, as older cohorts with large GMPs retire and young cohorts enter with small GMPs. Table 4.1 showed the past and projected value of the rebate, with a slow decline from 7.0 per cent at its introduction to 3.4 per cent when SERPS matures.

CHAPTER 8

Where Next?

This brief final chapter draws together what has been written earlier about likely directions for the future, and attempts to outline plausible options for government policy. We begin by discussing basic state provision, then move on to compulsory supplementary provision and finally voluntary supplementary provision.

Basic State Provision

As we have emphasised throughout this book, pensions policy has been far from stable in the post-war period. This instability has been revealed most clearly in the treatment of the basic state pension. There have been substantial fluctuations in its value, reflecting changes in indexation (uprating) procedures. The real value of the pension rose discontinuously for 20 years, steadily for a decade, and has subsequently fallen relative to earnings. The value of income support[1] has fluctuated relative to the basic pension, but in the last decade a clear wedge has developed between the basic pension and the higher level of income support, complemented by the rapid growth of expenditure on means-tested housing benefit and council tax benefit.[2]

If we simply continue with the current policy of uprating the basic pension in line with prices, its value relative to the official

1. Previously supplementary benefit and before that National Assistance.
2. And its predecessors community charge benefit and rates rebates.

poverty standard will fall steadily. In effect, the task of poverty alleviation will increasingly be borne by the means-tested sector: income support, housing benefit and council tax benefit.

This 'policy' of allowing the means-tested sector to take on the task of poverty alleviation may be acceptable simply because it involves no contentious new policy initiative or major upheaval. It would also solve the problem of financing pensions, by better targeting. But it would fail to address the problems of non-take-up and complexity inherent in the current system, and would do nothing to resolve saving incentive problems for those with low incomes. One possible reform strategy to deal with these problems was set out in Chapter 6; and there are other less radical alternatives that might tackle some of the same problems. The best policy response to non-take-up, complexity and saving disincentives may be a subject for debate, but we would argue that the need for *some* policy response is clear.

Compulsory Supplementary Provision

The role of compulsory supplementary provision is growing at present as SERPS moves towards maturity, alongside the alternatives for those who opt to contract out of SERPS. The proportion of the retired population with some entitlement to SERPS or a SERPS alternative will continue to grow, and so will the average size of that entitlement. But current uprating procedures and the reductions in the SERPS accrual rate will mean that as we move well into the next century, the proportion of earnings on which SERPS entitlements can be earned will fall, with the limit for earnings on which SERPS can be earned at little more than half average male earnings by 2040. The state commitment to the contracted-out sector, in the form of the rebate, will also decline as, consequently, will the GMP.

Before analysing possible policy responses, we need to ask whether any response is necessary. It could be argued that the paternalistic role of the state is fulfilled by adequate basic state provision and that there is simply no need for the state to force individuals to save more for their retirement. While this argument has some force, there are possible reasons for desiring

some compulsion. First, if the state is to provide a generous basic level of benefit much of which is means-tested, there could be a group of individuals whose natural inclination would be not to save and to rely on state benefits in retirement. Second, paternalism might extend to the view that in addition to some basic minimum, individuals should be required to make provision for at least some earnings replacement, whether of lifetime earnings or of earnings towards the end of the working life.

It is also worth noting that even if state supplementary provision is not to be compulsory, there are arguments for a state supplementary scheme being available to those for whom private provision is unattractive. Two obvious such groups are those with very low earnings, for whom the costs involved in private provision are prohibitive, and those who simply prefer to be part of a state scheme as opposed to a contracted-out one.

If the state is to be involved in supplementary provision, it faces the same choices on a continuum from pure defined benefit to pure defined contribution as does the private sector. Most public sector supplementary schemes have been of a principally defined benefit type, although by no means purely so. SERPS in the UK is clearly in a defined benefit mould. Defined benefit schemes such as SERPS will typically conflate the two aims of compulsory state supplementary provision, of earnings replacement and redistribution. This conflation of roles makes it hard to see precisely what the redistributive effects of the scheme are, and raises the question of why any redistribution required is not done directly in the basic state scheme. There is no necessity for supplementary state provision to be of a mainly defined benefit type; indeed, moving towards a defined contribution type arrangement would allow any redistribution to be more explicit, and would presumably give potential beneficiaries a clearer idea of their accrued pension wealth.

Voluntary Supplementary Provision

Although there has been rapid change in all areas of pension provision, it is in voluntary supplementary provision that we have seen most change. There has been growth in the numbers

receiving occupational pensions and the average level of their receipt; and we have seen the explosive growth of personal pension plans. The choices facing individuals have certainly been multiplied, and in some cases bad choices have been made, either through lack of information and understanding, or on occasion through the provision of information that is simply incorrect. Nevertheless, introduction of such schemes has enhanced choice, and for many individuals under reasonable assumptions, such forms of pension plan are an attractive and sensible option. What is needed is the right balance of regulation and of government 'incentive' for such plans, both to minimise budgetary cost and to ensure that individuals receive value for money.

Given the likely development of state provision, and continuing growth in personal incomes, we can expect to see further growth and change in this sector. One trend that has been clear recently has been increased interest in DC type schemes among employers and the relative decline in the importance of DB type schemes. This trend is not simply the result of the growth of personal pension plans, but is also seen in the growth of DC type occupational schemes. This is a trend we expect to see continue.

DB plans will continue to be attractive to covered individuals because they are effectively 'locked in' by their employers' contributions. There is increased concern about the treatment of early leavers and of preserved benefits. Increased regulation here could have an impact, but would move occupational DB plans closer to DC contracts, and presumably reduce the willingness of companies to offer such schemes.

Policy-makers face many issues in this sector, despite the lack of direct public sector involvement in provision. First, given the growing choice available to individuals, what can or should the Government do to facilitate well-informed and appropriate decisions? Second, is there a need for new types of regulation of pension funds? Third, is there a role for the Government in helping to provide financial instruments that will allow those in DC schemes to reduce capital market uncertainty (deferred annuities)? Fourth, is there anything the Government can or should do to enhance choice? In particular, while employers may no longer force employees into occupational schemes and must allow them into personal pension plans, they are not bound to

make contributions to a personal pension plan even if they would make large contributions to an occupational pension.

Conclusion

The pace of change in pension provision, both public and private, has been rapid in recent decades. Such change is particularly difficult to analyse and understand in an area where the consequences of decisions and policies early in an individual's working life can still be having an effect 70 years later. Our aim in this book has been to demonstrate that further change is inevitable, even where it appears to take the form of unchanged government policy. For many individuals, their pension will be the largest asset they ever own; careful consideration of the future development of the pensions sector, and the role of government in it, is vital.

Glossary

accrual rate
The rate at which pension entitlement is built up relative to earnings in earnings-related schemes, for example, $^1/_{60}$th of *final salary*.

accrued pension
The value of the pension to a member at any point prior to retirement, which can be calculated either on current earnings or on a basis allowing for future increases to pension benefits with increases in individual earnings.

additional voluntary contributions (AVCs)
Contributions to an *occupational pension scheme* over and above the normal employee's contribution rate.

adverse selection
Adverse selection occurs when bad risks drive out good in a market, leading to a further increase in the proportion of bad risks.

agency slack
Individuals are unable to monitor the efforts of their agents comprehensively. Agency slack occurs when the agent is averse to effort and so under-performs. In the case of pensions, for example, investors may not be able to monitor fund managers who, as a consequence, may not do their best for the investors. See also *moral hazard*.

annuity
A stream of payments at a specified rate, which may have some provision for inflation-proofing, payable until some

contingency occurs, usually the death of the beneficiary or a surviving dependant.

annuity factor
The net present value of a stream of pension or annuity benefits.

annuity rate
The value of the annuity payment relative to its lump-sum cost.

basic state pension
The flat-rate state pension paid to all meeting the National Insurance contribution test and their surviving dependants from state pensionable age.

commutation
Exchange of part of the *annuity* component of a pension for an immediate lump sum.

comprehensive income tax
A tax on all incomes, whether from earnings or investments and whether used for saving or consumption. A pure comprehensive income tax allows the component of investment returns compensating for inflation, and so taxes only real returns.

contracted-out rebate
The amount by which employers' and employees' National Insurance contributions are reduced for *contracting out* of the *State Earnings-Related Pension Scheme*, and the minimum contribution to a *personal pension plan*.

contracting out
An arrangement whereby, in return for paying a reduced rate of National Insurance contribution and provided a number of further conditions are met by the pension provider, an individual forgoes some of their right to state earnings-related pension on retirement.

deferred annuity
A stream of benefits commencing at some future date.

defined benefit scheme
A pension plan where benefits are determined by years of scheme membership and usually by some measure of salary, often *final salary* or some average over working life.

defined contribution scheme
A pension plan where benefits are determined by the amount of contributions paid into the fund and the size of the investment return they earn.

disclosure
Statutory regulations requiring the communication of information regarding pension schemes, funds and benefits to pensioners and employees.

discretionary increase
An increase in a pension in payment not specified by the pension scheme rules.

early leaver
A person who leaves an *occupational pension scheme* without receiving an immediate benefit.

early retirement
Retirement before reaching an occupational scheme's *normal retirement age* or, in the state scheme, before state pensionable age.

earnings cap
A limit to the amount of earnings eligible for tax relief on contributions or benefits introduced in Finance Act 1989 and originally set at £60,000 and now £75,000, subsequently increased in line with prices with the exception of Finance Act 1993.

expected job tenure valuation
A valuation of a *defined benefit* occupational pension taking account of the effect of increments to earnings over likely future pension plan tenure.

expenditure tax
A tax on consumption or expenditure, whether undertaken now or in the future.

final salary
Pensionable earnings at or near to the date of leaving an *occupational pension scheme*.

free-standing additional voluntary contributions (FSAVCs)
Pension contributions on top of those paid into an *occupational pension scheme* but under a contract with a separate provider from the occupational scheme.

funding
Accumulation of assets in advance to meet future pension liabilities.

graduated pension
The state earnings-related scheme that preceded SERPS, with additional pension accrued between 1961 and 1975.

guaranteed minimum contribution (GMC)
In the case of a *personal pension plan*, the payment of the *contracted-out rebate* direct from the DSS to a pension provider; in the case of contracted-out *defined contribution* occupational schemes, the minimum that the employer must ensure is contributed.

guaranteed minimum pension (GMP)
The minimum pension a contracted-out *occupational pension scheme* must provide, unless it contracts out by agreeing to make the *guaranteed minimum contribution*.

hazard function
The probability of leaving a particular state conditional on the length of time spent in it.

implicit lifetime contract valuation
A valuation of a *defined benefit* occupational pension which assumes an implicit lifetime employment contract, and so uses projected *final salary* as the base.

incentive rebate
A 2 per cent addition to the *contracted-out rebate* paid from 1988–89 to 1992–93 into *personal pension plans* or newly contracted-out *occupational pension schemes*, reduced to 1 per cent and restricted to the over-30s from 1993–94.

indexation
Increases in benefits by reference to an index, usually of prices, though in some cases of average earnings.

insured scheme
An *occupational pension scheme* where the benefits are secured by a contract between the pension scheme and an insurer.

inter-generational redistribution
The transfer of resources from one generation to another.

intra-generational redistribution
The transfer of resources between members of a single generation.

legal contract valuation
A valuation of a *defined benefit* occupational pension which asserts that since employers have no legal obligation to employ an individual beyond a notice period, the value should be based on current earnings and current tenure in the pension plan.

limited price indexation
Statutory requirement to increase *preserved pension rights* or pensions in payment by the retail prices index up to a maximum level.

lower earnings limit (LEL)
The level of earnings per pay period above which National Insurance contributions become payable and an employee is eligible for SERPS entitlements and the *contracted-out rebate*. It is set approximately equal to the *basic state pension*.

management slack
The absence of competition results in inefficiency, when managers seek to satisfy their own goals rather than those of the individual scheme members.

marginal pension
The change in the *accrued pension* between two periods.

money purchase scheme
See *defined contribution scheme*.

moral hazard
Occurs in any transaction when one party can affect the value of the transaction to another who cannot monitor or enforce the contract. In insurance markets, for example, individuals take less care to avoid risks when insured.

normal retirement age
The usual age at which employees become eligible for occupational pension benefits, excluding early retirement provisions.

occupational pension scheme
An arrangement by an employer to provide retirement benefits to employees.

over-annuitisation
Through compulsory pension provision, an individual is forced to save more in pension than they would do in the absence of the compulsory provision.

pay-as-you-go (PAYG)
A pension finance arrangement whereby current liabilities are met from current contributions, and no fund is accumulated in advance to meet future liabilities.

pensionable earnings
The portion of remuneration on which pension benefits and contributions are calculated.

Pension Law Review Committee (the Goode Committee)
An independent committee established by the Secretary of State for Social Security in June 1992 to review the legal and regulatory framework for occupational pensions, chaired by Professor Roy Goode. It reported in September 1993.

pension lump sum
A cash withdrawal from a pension plan, which in the case of some *occupational pension schemes* is provided in addition to an *annuity*. Also available from *personal pension plans*.

personal pension plan
Individual retirement savings account eligible for income tax relief on contributions and investment returns and a tax-free

lump sum. Can be used for *contracting out* of SERPS provided it meets a number of conditions, see *protected rights*.

preserved pension rights
The pension benefits accrued by an individual leaving an occupational scheme which are not payable until a future date.

principal–agent problem
One party in a transaction is unable to monitor or enforce comprehensively a contract with another party. See also *agency slack*.

protected rights
The pension benefits in a *personal pension plan* or contracted-out *defined contribution* occupational scheme that derive from the *guaranteed minimum contribution* and associated investment returns, provision of which is necessary for *contracting out*.

State Earnings-Related Pension Scheme (SERPS)
The additional component of the state pension scheme, giving a pension at state pension age based on individual average earnings.

supplementary pensions
Pension provision beyond the *basic state pension*, including SERPS, occupational schemes and personal pensions.

survival function
The probability of remaining in a particular state conditional on the length of time in that state.

transfer value
The amount of the payment made from one occupational scheme to another or to a personal pension provider in return for forgoing accrued pension benefits in an occupational scheme.

trust
A legal form where assets are held by trustees on behalf of beneficiaries, to provide a benefit specified by the trust deed.

upper earnings limit (UEL)
The maximum amount of earnings liable for National Insurance contributions, set between $6^1/_2$ and $7^1/_2$ times the *basic state pension*, and the maximum amount of earnings eligible for SERPS and the *contracted-out rebate.*

uprating
See *indexation.*

winding-up
Termination of an *occupational pension scheme* either by transferring the assets and liabilities to another scheme or by using the assets to buy *deferred annuities* to finance future benefit liabilities.

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