



National Audit Office

**REPORT BY THE
COMPTROLLER AND
AUDITOR GENERAL**

**HC 432
SESSION 2009–2010**

12 MARCH 2010

The cost of public service pensions

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National Audit Office

The cost of public service pensions

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Amyas Morse
Comptroller and
Auditor General

National Audit Office

5 March 2010

This report is about pensions paid to retired public servants such as teachers, civil servants, doctors, nurses and members of the armed forces. Its aim is to bring greater transparency to, and understanding of, the costs of public service pensions.

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This report can be found on the
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Summary

1 This report is about pensions paid to retired public servants such as teachers, civil servants, doctors, nurses and members of the armed forces. It covers all UK public service ‘pay-as-you-go’ pension schemes, sometimes known as ‘unfunded’ schemes, which are part of the cost of providing public services and are ultimately funded by the taxpayer. Pay-as-you-go pension schemes contrast with funded schemes, in which contributions are used to create assets in a pension fund, by using today’s contributions from current employees and employers to pay today’s pensions.

2 The report does not discuss public service funded pension schemes, of which the local government pension scheme is the largest. It does not cover the schemes of nationalised industries, like the Royal Mail, or of bodies that receive substantial public money but operate independently, such as universities. Also outside the scope of this report is any calculation of the tax effects of public service pensions, which include tax relief on employee contributions and tax paid by pensioners, or of the extent to which public service pensions reduce alternative taxpayer demands, notably on Pension Credit. We have recently published a separate report on the Pension Protection Fund, which pays compensation to members of private sector defined benefit pension schemes in certain cases where employers become insolvent.

3 There has been much public debate about the affordability and fairness of public service pensions. The aim of this report is to bring greater transparency to, and understanding of, the costs of public service pensions. We will publish a second report later this year examining recent changes to the terms and conditions of UK public service pay-as-you-go pension schemes, which are designed in part to reduce costs.

4 This report looks at past pension payments over the last ten years and projected payments over the next fifty years. The analysis of past payments covers the four largest schemes, which represent over three quarters of all UK public service pay-as-you-go pension payments. The analysis of projected payments covers all UK public service pay-as-you-go pension schemes. An appendix discusses the representation of pension obligations as a single liability figure, which is especially relevant to funded (as opposed to pay-as-you-go) pension schemes.

5 The report does not draw an overall value for money conclusion or make recommendations. Our second report, to be published later this year, will do both these things.

On payments over the last ten years

6 Total payments to the 2.13 million pensioners in the four largest UK public service pay-as-you-go pension schemes were £19.3 billion in 2008-09, which is a real-terms increase of 38 per cent since 1999-2000. Most of the increase is due to a 23 per cent rise in pensions in payment over the period. This is driven by more employees retiring each year, which is a substantially more significant factor than longer lifespans.

7 Employee contributions to the four largest UK public service pay-as-you-go pension schemes were £4.4 billion in 2008-09, a real-terms increase of 56 per cent since 1999-2000. The increase is the result of higher contribution rates and more staff making contributions. Employee contributions reduce the cost of public service pensions to the taxpayer, because they take back into public funds a proportion of gross salaries already paid out.

8 The total cost to the taxpayer of the four largest UK public service pay-as-you-go pension schemes in 2008-09 was £14.9 billion, net of income from employee contributions, a real-terms increase of 33 per cent since 1999-2000. It was met through a combination of £12.5 billion in employer contributions generally paid by taxpayer funded organisations, such as NHS Trusts and government departments, as part of the normal cost of employing staff, and £2.5 billion directly from the Treasury (the two elements not adding exactly because of rounding). Contributions are set to reflect pensions being earned by current employees, so are not designed to equal pensions in payment in any one year. The Treasury figure provides the balance required to meet pension payments. Contributions are generally less than payments over the long term in mature pension schemes, whether funded or pay-as-you-go.

On projected payments over the next fifty years

9 Projected annual payments across all UK public service pay-as-you-go pension schemes can be analysed in three ways, reflecting the need for a rounded interpretation of long-term figures in the context of a financial environment that will also change substantially.

- Expressed in terms of 2008-09 prices, the Government Actuary's Department projects payments rising to £79.1 billion by 2059-60 from an estimated £25.4 billion in 2009-10.
- Expressed in terms of 2008-09 earnings, projected payments reach a peak of £29.4 billion between 2031-32 and 2033-34 before falling to £28.8 billion by 2059-60. This is based on the Treasury's assumption of 2.0 per cent real-terms annual earnings growth across the economy as a whole.
- Expressed in terms of Gross Domestic Product (GDP), the presentation the Treasury uses in its *Long-term public finance reports*, projected payments reach a peak of 1.9 per cent of GDP between 2018-19 and 2033-34 then fall to 1.7 per cent by 2059-60. This compares to a rise from around 1.5 per cent to 1.7 per cent over the last ten years. The projection is based on Treasury assumptions of 2.0 per cent annual productivity growth in the economy as a whole and 20 per cent growth over 50 years in the working population.

10 Projections of future payments depend critically on assumptions used as the basis of calculations. Changes to these assumptions can have a large impact on results. The Treasury's four main assumptions for projecting the cost of UK public service pay-as-you-go pensions are:

- average life expectancy of pensioners in UK public service pay-as-you-go schemes rising steadily, for example to 94.7 for women and 92.3 for men who reach 65 in 2055, in line with assumptions by the Office for National Statistics, but reflecting the longer-than-average lives of occupational pension scheme members;
- real-terms earnings growing by 2.0 per cent a year for employees in UK public service pay-as-you-go pension schemes, linked to the assumptions described earlier of 2.0 per cent annual growth in productivity and real-terms earnings in the wider economy;
- a constant number of employees covered by UK public service pay-as-you-go pension schemes; and
- two-thirds of employees' share of increased future pension costs being taken as reduced future pension payments, and one-third as increased employee contributions, under changes to the schemes that we will examine in detail in our second report.

On sensitivity analyses

11 The Treasury has undertaken some analysis on the sensitivity of its projections to changes in key assumptions. In each case, changes in the opposite direction to those illustrated below would have the opposite effect, smaller or larger changes would have proportionally smaller or larger effects, and the combination of changes would reinforce each other or partially cancel out depending on their respective directions.

- Higher life expectancy, equal for example to around two extra years for a man reaching 65 in 2015 and three extra years for a man reaching 65 in 2025, would add around 0.05 percentage points to the cost of public service pensions as a proportion of GDP by 2059-60.
- A 0.25 per cent lower annual productivity growth rate, affecting earnings and GDP, would add 0.1 percentage points to the cost of public service pensions as a proportion of GDP by 2059-60.

12 The Treasury has not undertaken any systematic analysis of the impact of changing the assumption about zero public service workforce growth, although it did consider doing so. In our view, such an analysis is needed to understand the potential impact on public service pension costs of plausible alternative outcomes.

- A constant number of employees, if reflected more widely across the public sector, would mean a very large reduction in public service employment as a proportion of employment as a whole. In the context of assumed growth of 20 per cent over 50 years in the overall UK workforce, public sector employment would fall to 16.3 per cent by 2059-60, from 19.5 per cent in 2008 and 21.1 per cent in 2009.
- Recent trends have been of strong public service workforce growth. The number of people in areas of employment covered by the four largest UK public service pay-as-you-go pension schemes rose by 21 per cent in the period 1999-2000 to 2008-09.
- Although short term expectations are of a reducing public service workforce, factors such as larger numbers of older people are likely to increase demand on public services.
- The most significant factor in increasing pension costs over the last ten years has been the rising numbers of retirements, which are directly linked to the numbers of staff in post.

Conclusion

13 Real-terms increases of 38 per cent in the costs of paying pensions in the four largest UK public service pay-as-you-go schemes, over the last ten years, have been driven by increases in the number of employees retiring. On the basis of the Treasury's assumptions, the total cost of paying public service pay-as-you-go pensions is projected to increase as a proportion of GDP over the next fifty years, rising from 1.7 per cent to 1.9 per cent before falling back to 1.7 per cent. Higher life expectancy and lower productivity growth would increase the cost of public sector pensions as a proportion of GDP. Conversely, lower life expectancy and higher productivity growth would reduce costs as a proportion of GDP. There is a reasonable framework in place for assessing future pension costs, including sensitivity analysis covering some significant assumptions. The Treasury has not assessed the impact of different assumptions about the size of the public service workforce, despite it being a critical driver of pension costs. Our second report will examine sensitivity analyses further.

Part One

Introduction

1.1 This report sets out information on the cost of UK public service ‘pay-as-you-go’ pension schemes, sometimes known as ‘unfunded’ schemes. Appendix 1 summarises how we prepared the report.

- **Part 1** discusses the purpose, context and scope of the report.
- **Part 2** analyses detailed data from the last ten years on payments from the four largest UK public service pay-as-you-go pension schemes, and on contributions to them.
- **Part 3** covers projections of payments from all UK public service pay-as-you-go pension schemes over the next fifty years

1.2 Unusually for a report by the Comptroller and Auditor General, we do not draw an overall value for money conclusion or make recommendations. Instead, the aim of this report is to bring greater transparency to, and understanding of, the costs of public service pensions. It provides the basis for further work, which we will carry out during 2010, on the effectiveness of recent changes to public service pension schemes. Among other things, these changes are designed to improve future affordability.

1.3 The report does not discuss funded public service pension schemes, of which the local government pension scheme is the largest. It does not cover the schemes of nationalised industries, like the Royal Mail, or bodies that receive substantial public money but operate independently, such as universities. Also outside the scope of this report is any calculation of the tax effects of public service pensions, which include tax relief on employee contributions and tax paid by pensioners, or of the extent to which public service pension payments reduce alternative taxpayer demands, notably on Pension Credit. We have recently published a separate report on the Pension Protection Fund, which pays compensation to members of private sector defined benefit pension schemes in certain cases where employers become insolvent.¹

¹ *Pension Protection Fund*, National Audit Office, HC 293 2009-2010, 5 February 2010.

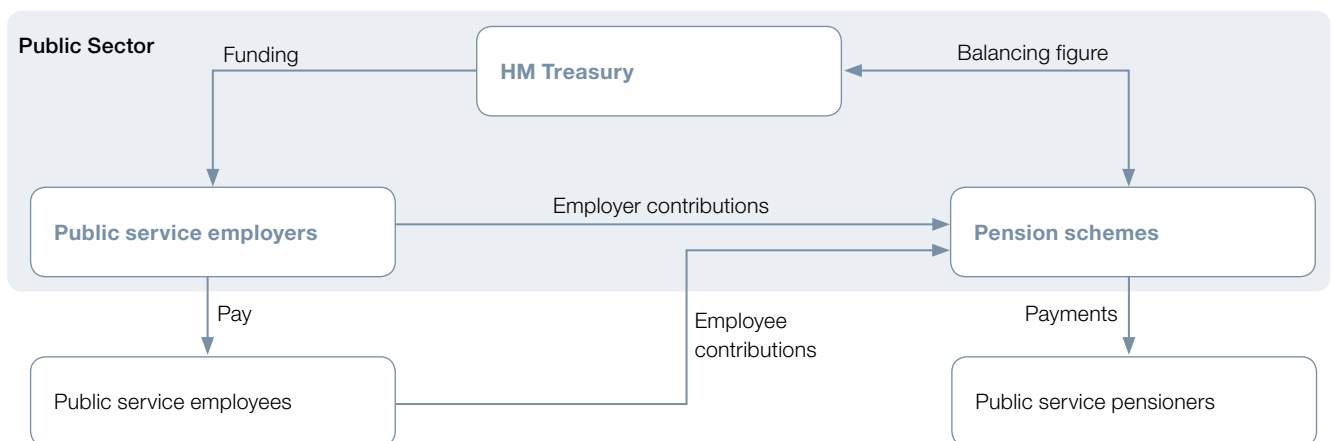
1.4 Appendix 2 lists all the UK public service pay-as-you-go pension schemes identified by the Treasury. It explains how the Government Actuary's Department uses information from the largest schemes to provide the basis for projected future payments from all schemes. Appendix 3 summarises some of the key features of the four largest UK public service pay-as-you-go pension schemes, including recent changes that apply to new entrants. Appendix 4 provides an analysis of the distribution of pensions in payment from the four largest UK public service pay-as-you-go schemes.

1.5 Pay-as-you-go schemes contrast with funded schemes in which contributions are used to create assets in a pension fund. Cash to pay pensions in a funded scheme may come from investment income and asset sales, including any capital growth, in addition to employer and employee contributions. In a pay-as-you-go scheme, today's contributions from current employees and employers are used to pay today's pensions (**Figure 1**).² In government-sponsored pay-as-you-go schemes, payments from or to the Treasury cover any difference between pension payments and contributions.

1.6 Pension payments are examples of transfers of resources between generations, in this case from younger people to older people. Such transfers take place in public service pensions, private sector pensions and the state pension. The market for buying and selling capital assets provides an alternative mechanism to taxation for effecting the transfer in the case of funded pension schemes. Raising and educating children are examples of transfers in the opposite direction from older people to younger people.

Figure 1

Payments and contributions in pay-as-you-go pension schemes



Source: National Audit Office

² The decision to operate pay-as-you-go, rather than funded, schemes is a policy decision outside the scope of this study.

1.7 Where there is an obligation to transfer resources, as is the case for public service and private sector pension schemes, that obligation can be represented as a financial liability. Appendix 5 provides further information on liability calculations, which are particularly important for funded schemes. The rest of this report focuses on cash payments because:

- projected cash payments are considered by the government to be the most relevant measure of the cost of UK public sector pay-as-you-go pension schemes over the next fifty years;
- projected annual cash payments can be related to estimated annual Gross Domestic Product as a measure of the country's ability to pay;
- cash projections include pensions expected to be earned in the future, and are useful for decision-making about changes to schemes, whereas liabilities represent only pensions already earned that would be unaffected by scheme changes; and
- liability calculations can fluctuate substantially because of changes in one significant assumption, the discount rate, which does not affect cash payment projections.

Part Two

Payments and contributions over the last ten years

2.1 This part of the report describes trends in payments and contributions over the last ten years for the four largest UK public service pay-as-you-go pension schemes. It discusses:

- total payments of pensions and lump sums, including underlying trends in numbers of pensioners and surviving dependents, and average payments to them;
- total employee contributions and underlying trends; and
- total costs to the taxpayer through employer contributions and Treasury payments.

2.2 The largest four pay-as-you-go schemes are:

- the Armed Forces Pension Scheme (covering the United Kingdom);
- the Principal Civil Service Pension Scheme (for England, Scotland, Wales and some employees in Northern Ireland);
- the NHS Pension Scheme (for England and Wales); and
- the Teachers' Pension Scheme (for England and Wales).

2.3 The four schemes have accounted for over 75 per cent of total payments from UK public service pay-as-you-go pension schemes in recent years. They are all defined benefit, where the pension that a retired employee receives depends on salary earned and the number of years of service.³ Combined, the schemes had 6.5 million members at 31 March 2009, comprising 2.75 million current staff, 1.59 million previous employees who had earned pensions but were not yet eligible to draw them, and 2.13 million pensioners.

³ The Principal Civil Service Pension Scheme also has a small defined contribution element that we do not cover in this report.

Payments from the schemes

2.4 Total payments to pensioners in the four schemes rose by 38 per cent to £19.3 billion in 2008-09 from £14.0 billion (at 2008-09 prices) in 1999-2000 (**Figure 2**). The pension schemes, in accordance with their terms and conditions, usually pay a lump sum when an employee retires, followed by a regular pension until the death of the pensioner and any eligible dependents. In 2008-09, total ongoing pensions were £15.8 billion, while one-off lump sums totalled £3.5 billion.

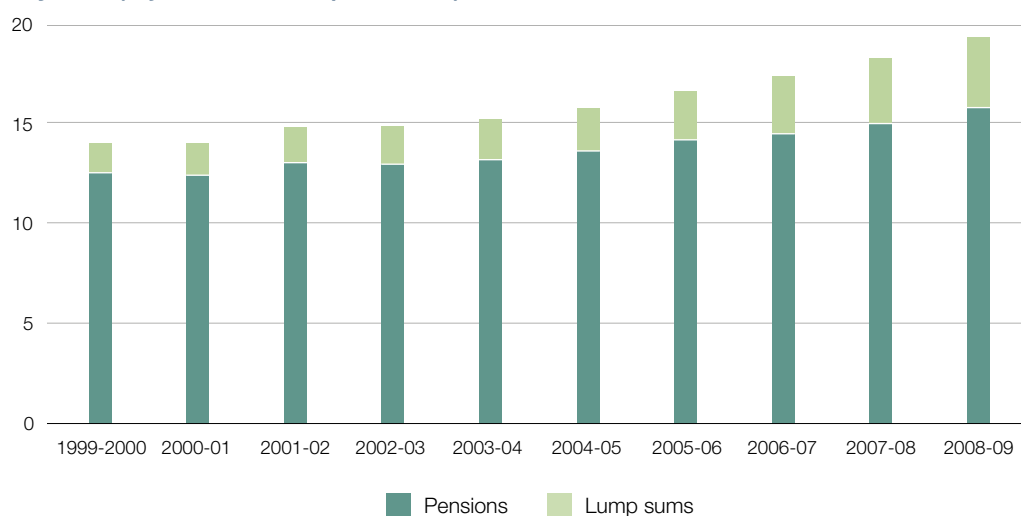
Factors underlying increased pension payments

2.5 The dominant factor underlying the 26 per cent real-terms increase, since 1999-2000, in the amount paid in pensions by the four schemes is the 23 per cent increase in the number of pensions (**Figure 3**). There has been a small additional rise in the average real-terms level of pensions. In the absence of other factors, real-terms rises in average wages over time drive increases in pensions because newly starting pensions, based on salaries that have benefited from real-terms growth over many years, replace older ceasing pensions based on lower average salaries from earlier years. In practice, as the declining average pension of retired teachers demonstrates, other factors also have an effect. The scope of our report does not include investigations at this level of detail.

Figure 2

Total pensions and lump sums paid from the four largest UK public service pay-as-you-go pension schemes since 1999-2000

Payments (adjusted to 2008-09 prices – £bn)



Source: National Audit Office analysis of resource accounts

Figure 3

Pensions paid from the four largest UK public service pay-as-you-go pension schemes in 2008-09 compared to 1999-2000

	Number of pensions in payment			Average (mean) pension			Total pensions paid		
	At March 2000	At March 2009	Percentage change	1999-2000 (adjusted to 2008-09 prices) (£)	2008-2009 (£)	Percentage change	1999-2000 (adjusted to 2008-09 prices) (£bn)	2008-2009 (£bn)	Percentage change
Armed forces	335,306	396,511	18	7,134	7,519	5	2.39	2.98	25
Civil service	528,500	581,000	10	5,603	5,928	6	2.96	3.44	16
NHS	450,900	610,248	35	6,920	6,931	0	3.12	4.23	36
Teachers	415,984	546,158	31	9,745	9,358	-4	4.05	5.11	26
Total	1,730,690	2,133,917	23	7,238	7,388	2	12.53	15.77	26

Source: National Audit Office analysis of resource accounts

NOTE

Average pensions are calculated by dividing the total pensions paid in the year by the number of pensions in payment at the end of the year. The calculation is approximate but materially accurate, typically overstating average pensions by about one per cent, and on a consistent basis for each scheme. The figures include payments to pensioners and surviving dependents. Totals do not sum exactly due to rounding. Percentage changes are calculated before rounding.

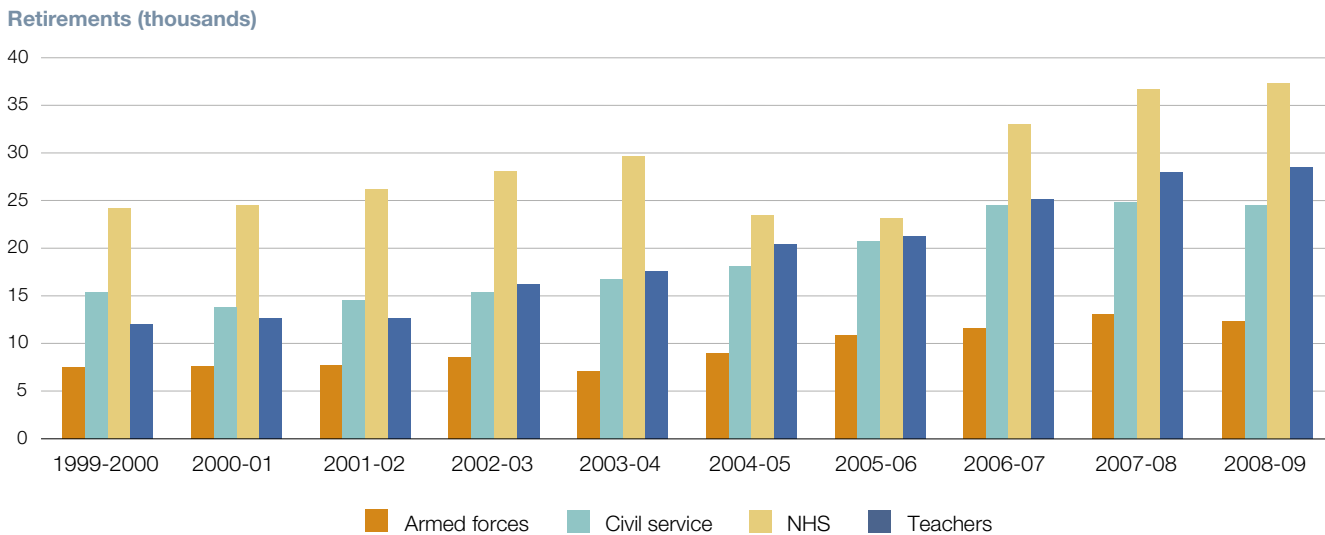
2.6 The increasing number of pensions reflects the fact that there are more pensions coming into payment each year, as employees retire, than pensions ceasing on the death of pensioners or their surviving eligible dependents. Cessations have remained relatively stable over the last ten years, whereas the number of retirements each year has increased (**Figure 4** overleaf), indicating that higher numbers of retirements have been much more significant than increases in pensioners' lifespans in driving pension payments.

Factors underlying increased lump sum payments

2.7 The main factor underlying the 143 per cent real terms increase, since 1999-2000, in the amount paid in lump sums is also the increasing number of retirements each year (**Figure 5** overleaf).

Figure 4

Retirements in the four largest UK public service pay-as-you-go pension schemes since 1999-2000



Source: National Audit Office analysis of resource accounts supplemented, where necessary, by additional data from pension schemes

Figure 5

Lump sums paid from the four largest UK public service pay-as-you-go pension schemes in 2008-09 compared to 1999-2000

	Number of retirements			Average lump sum			Total lump sums paid		
	1999-2000	2008-2009	Percentage change	1999-2000 (adjusted to 2008-09 prices) (£)	2008-2009 (£)	Percentage change	1999-2000 (adjusted to 2008-09 prices) (£bn)	2008-2009 (£bn)	Percentage change
Armed forces	7,524	12,378	65	47,804	34,511	-28	0.36	0.43	19
Civil service	15,163	24,470	61	20,363	25,847	27	0.31	0.63	105
NHS	24,228	37,324	54	16,774	32,643	95	0.41	1.22	200
Teachers	12,042	28,515	137	31,427	43,961	40	0.38	1.25	231
Total	58,957	102,687	74	24,650	34,392	40	1.45	3.53	143

Source: National Audit Office analysis of resource accounts, supplemented by additional information on retirements from pension schemes

NOTE

Average lump sums are calculated by dividing the total amount paid out in lump sums in each year by the number of new pensioners in that year. Totals do not sum exactly due to rounding. Percentage changes are calculated before rounding.

Employee contributions to the schemes

2.8 The total of employee contributions paid into the four schemes rose has risen, in real terms, by 56 per cent to £4.4 billion in 2008-09 from £2.8 billion (at 2008-09 prices) in 1999-2000 (**Figure 6**). Employee contributions reduce the cost of public service pensions to the taxpayer because they take back into public funds a proportion of gross salaries already paid out (as illustrated previously in Figure 1 on page 9).

Figure 6

Total employee contributions to the four largest UK public service pay-as-you-go pension schemes since 1999-2000

Contributions (adjusted to 2008-09 prices – £bn)



Source: National Audit Office analysis of resource accounts

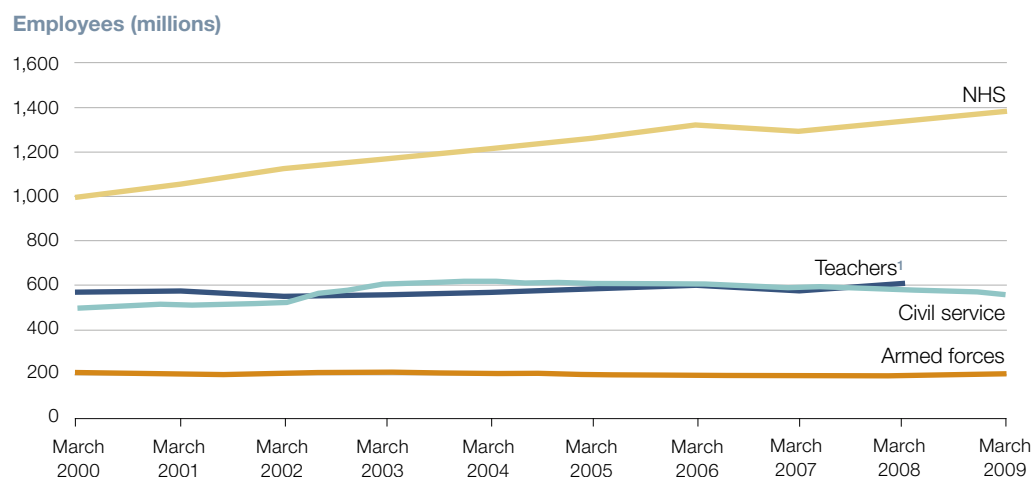
Factors underlying increased employee contributions

2.9 The increase in employee contributions is the combined result of more employees⁴ and higher average annual contributions from each (**Figures 7 and 8**). Increases in average contributions are mainly the result of increases to the contribution rate, although higher real average salary levels also play a part.

- Changes to the civil service scheme from October 2002 included an increased employee contribution rate to 3.5 per cent of pay for new entrants. The rate remained at 1.5 per cent for staff already in post, unless they opted to join the terms of the revised scheme.
- In the NHS scheme, most employees paid 6.0 per cent before April 2008, with manual employees paying 5.0 per cent. In April 2008 a tiered scale was introduced, with contributions in a range of 5.0 per cent to 8.5 per cent of pensionable pay, depending on total earnings.
- In the teachers' scheme, the employee contribution rate increased to 6.4 per cent from 6.0 per cent in January 2007.

Figure 7

Current employees in the four largest UK public service pay-as-you-go pension schemes from March 2000 to March 2009



Source: National Audit Office analysis of resource accounts

NOTE

1 The latest figures for employees in the teachers' pension scheme are for 31 March 2008.

⁴ Employees who are eligible to join a pension scheme may opt out of it. It is the number of employees who have not opted out of the schemes, in practice the vast majority, that affects the level of employee contributions. We use the term 'employees' for simplicity to mean employees who have not opted out of the schemes.

Figure 8

Employee contributions to the four largest UK public service pay-as-you-go pension schemes in 2008-09 compared to 1999-2000

	Number of employees			Average employee contributions			Total employee contributions		
	At March 2000	At March 2009	Percentage change	1999-2000 (adjusted to 2008-09 prices) (£)	2008-2009 (£)	Percentage change	1999-2000 (adjusted to 2008-09 prices) (bn)	2008-2009 (£bn)	Percentage change
Armed forces ¹	205,420	199,535	-3	–	–	–	–	–	–
Civil service	494,000	564,000	14	397	631	59	0.20	0.36	81
NHS	996,671	1,380,874	39	1,488	1,845	24	1.48	2.55	72
Teachers ²	570,624	609,534	7	1,956	2,408	23	1.12	1.47	32
Total	2,266,715	2,753,943	21	1,234	1,587	29	2.80	4.37	56

Source: National Audit Office analysis of resource accounts

NOTES

- 1 The armed forces pension scheme is non-contributory.
- 2 The latest figures for employees in the teachers' pension scheme are for 31 March 2008, so we have used these figures for 31 March 2009 in the absence of other information.
- 3 Totals do not sum exactly due to rounding. Percentage changes are calculated before rounding.

The cost of the schemes to the taxpayer

2.10 The total cost of the four schemes to the taxpayer has risen, in real-terms, by 33 per cent to £14.9 billion in 2008-09 from £11.2 billion (at 2008-09 prices) in 1999-2000 (**Figure 9** on page 19). This cost excludes the tax effects of public service pensions, such as tax relief on employee contributions and tax paid by pensioners. The cost to the taxpayer combines two elements: the contribution that employers make as part of the normal cost of employing staff, and a balancing payment from the Treasury to cover the difference between total pension payments and total contributions. Payments and contributions are driven by different populations and are not designed to balance in any one year. Overall, contributions to mature pension schemes in the private and public sectors are generally less than pension payments over the long term. Investment income and capital gains make up the difference in the case of funded schemes. In pay-as-you-go schemes, again over the long term, Treasury payments reflect the benefit of past alternative use of pension contributions to fund government activities without additional taxation or borrowing.

2.11 The main change in the nature of the cost to the taxpayer from 1999-2000 to 2008-09 has been the increasing proportion of the total being covered by higher employer contributions, caused chiefly by higher employer contribution rates (**Figure 10**). This has occurred progressively over the period, but particularly between 2002-03 and 2003-04. A significant change is reform of the methodology for setting employer contribution rates in many schemes which, by 2008-09, had introduced an allowance for inflationary increases made mandatory in legislation since the 1970s, but had not done so fully in 1999-2000. The increase in employer contributions, generally paid by taxpayer funded organisations, does not affect the overall cost to the taxpayer because it has the effect of reducing the balancing payment from the Treasury.

2.12 Increases in contribution rates have had the effect of bringing employer contributions closer to net pension payments, after allowing for employee contributions. However, the two are not designed to match because employer contribution rates are set to reflect the cost of future pensions being earned by current employees, not the cost of current pensions being paid to past employees.

2.13 Illustrating this point, recent employer contributions to the NHS scheme, unlike the situation in the other schemes, have been more than sufficient to cover current pension payments, so the scheme has returned surplus cash to the Treasury. This has occurred because increasing staff numbers have generated higher total employer contributions, leading to the current net cash surplus but giving rise to higher future pension obligations. Payments out of the NHS scheme can be expected to exceed contributions in future as this is the natural position for mature pension schemes in which employers and employees are charged at a level reflecting future pensions being earned.

Figure 9

Total cost to the taxpayer of the four largest UK public service pay-as-you-go pension schemes since 1999-2000



Source: National Audit Office analysis of resource accounts

Figure 10

Cost to the taxpayer of the four largest UK public service pay-as-you-go pension schemes in 2008-09 compared to 1999-2000

	Total employer contributions			Balance paid by (or to) the Treasury			Total cost to the taxpayer		
	1999-2000 (adjusted to 2008-09 prices) (£bn)	2008-2009 (£bn)	Percentage change	1999-2000 (adjusted to 2008-09 prices) (£bn)	2008-2009 (£bn)	Percentage change	1999-2000 (to 2008-09 prices) (£bn)	2008-2009 (£bn)	Percentage change
Armed forces	1.28	1.51	17	1.47	1.90	30	2.75	3.41	24
Civil service	1.59	2.80	76	1.48	0.92	-38	3.07	3.72	21
NHS	0.93	5.01	436	1.11	(2.11)	-290	2.04	2.90	42
Teachers	1.30	3.15	142	2.02	1.75	-13	3.32	4.90	48
Total	5.11	12.46	144	6.08	2.47	-59	11.18	14.93	33

Source: National Audit Office analysis of resource accounts

NOTE

Totals do not sum exactly due to rounding. Percentage changes are calculated before rounding.

Part Three

Payments over the next fifty years

3.1 Pensions earned by today's employees give rise to payment obligations extending, potentially, seventy years or more into the future. For financial planning it is essential to consider expectations about future payments.⁵ This part of the report:

- summarises projections, prepared by the Government Actuary's Department on behalf of the Treasury, of payments from all UK public service pay-as-you-go pensions schemes over the next fifty years; and
- describes the key assumptions underlying these projections and assesses the impact of varying them.

3.2 Employee contributions will reduce the cost to the taxpayer of payments from UK public service pay-as-you-go pension schemes, as they do now. Our second report, due to be published later this year, will examine the expected impact of recent changes to the pension schemes, including 'cost sharing' and 'cost capping' which are designed to reduce costs by a combination of higher employee contributions and lower pensions. The projections presented in this report include the Treasury's estimates of the impact of these changes.

Projected payments

3.3 We analysed projected annual payments across all UK public service pay-as-you-go pension schemes, prepared by the Government Actuary's Department for the Treasury, in three ways (**Figure 11** on pages 22 and 23). The different presentations allow long-term projections to be interpreted from a variety of perspectives, to reflect the fact that the financial environment will also change substantially over the projection period. The separation into amounts for the armed forces, civil service, NHS and teachers is at a UK level. In contrast, the individual schemes considered in Part 2, except for the armed forces scheme, cover less than the whole of the UK. In practice, each of those individual schemes covers at least England and Wales and therefore accounts for most of the UK cost. The projections are for total payments and do not allow for the extent to which employee contributions will reduce the actual cost to the taxpayer.

⁵ Financial planning for a funded pension scheme is informed by comparing a pension fund's assets with the net present value of the payments expected to be made to existing scheme members. For pay-as-you-go schemes, where there is no fund of assets, projected cash flows provide a more natural starting point.

3.4 Payments on UK public service pay-as-you-go pensions projected by the Government Actuary's Department will rise, at 2008-09 prices, to just over £79 billion by 2059-60 from an estimated £25.4 billion in 2009-10. This is an increase of over 200 per cent.

3.5 Because much of the real-terms rise in pension costs is driven by, and in the context of, expected increases in real terms earnings, it is informative to assess projected payments in relation to earnings across the economy as a whole. Expressed at 2008-09 earnings, payments on UK public service pay-as-you-go pensions projected by the Government Actuary's Department will rise by 16 per cent to £28.8 billion by 2059-60 from an estimated £24.9 billion in 2009-10. They will peak at £29.4 billion between 2031-32 and 2033-34. The projection is based on the Treasury's assumption of 2.0 per cent real-terms annual earnings growth across the economy as a whole. The difference from the first presentation indicates that all but 16 per cent of the projected increase in pension costs over the period tracks expected increases in general earnings.

3.6 The Government's ability to raise taxes to pay for its activities, including paying public service pensions, depends on the size of Gross Domestic Product (GDP), so the Treasury reports projected payments as a percentage of GDP in its *Long-term public finance reports*.⁶ Payments on UK public service pay-as-you-go pensions, according to pension projections by the Government Actuary's Department and GDP projections by the Treasury, will reach a peak of nearly 1.9 per cent of GDP between 2018-19 and 2033-34 before falling to just below 1.7 per cent by 2059-60. This compares to a rise from around 1.5 per cent to 1.7 per cent over the last decade. The projection is based on Treasury assumptions of 2.0 per cent annual productivity growth in the economy as a whole and 20 per cent growth over 50 years in the working population.

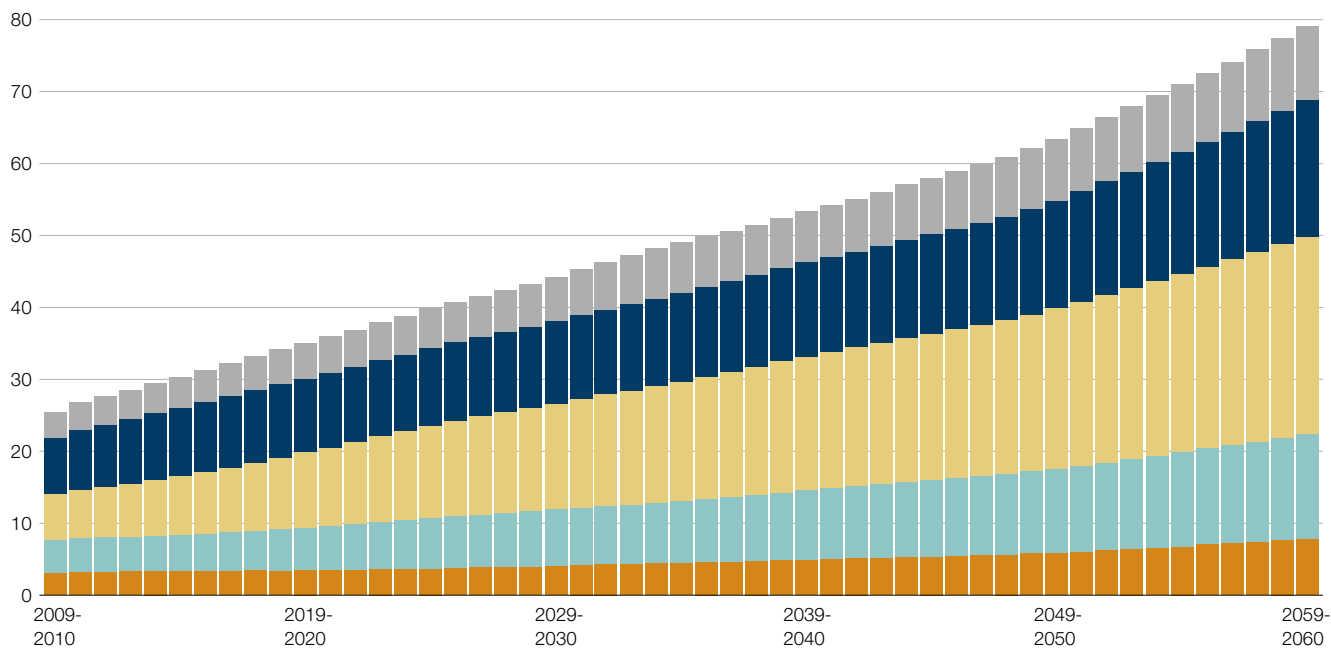
3.7 NHS pension payments are expected to increase from 25 per cent of all payments in 2009-10 to 35 per cent by 2059-60. This illustrates the comment in Part 2 that the current positive cash position of the NHS scheme in England and Wales is linked to higher future pension obligations.

⁶ The Treasury has published a *Long-term public finance report* in every year since 2002, with the exception of 2007.

Figure 11
 Projected annual payments from the UK public service pay-as-you-go pension schemes

Pension payments at constant 2008-09 prices

£ billion



Pension payments at constant 2008-09 earnings

£ billion

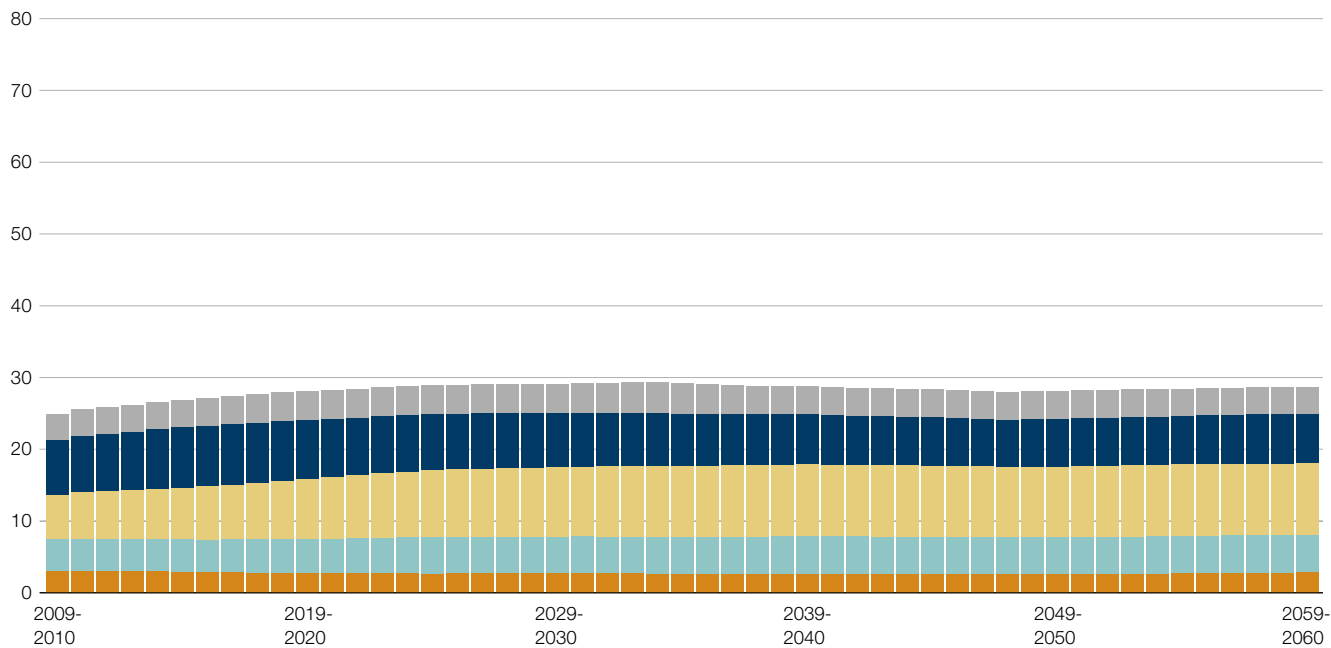
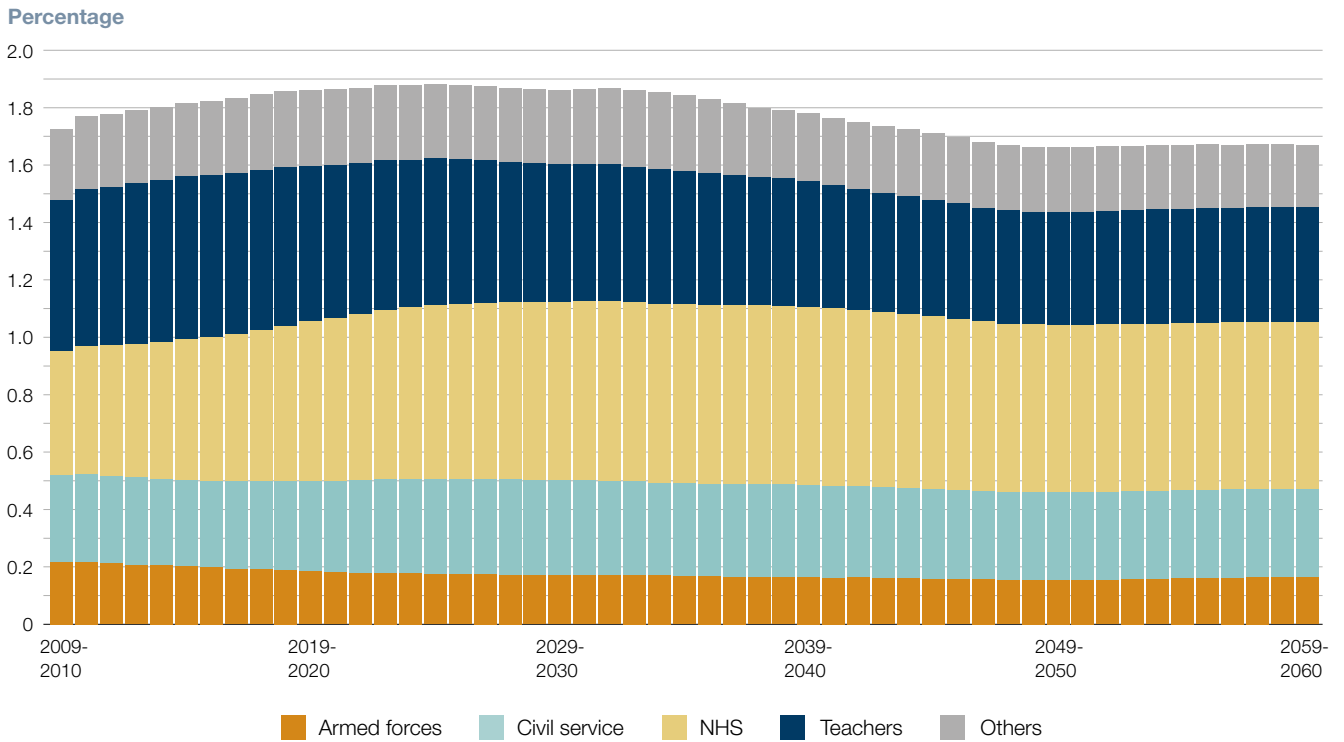


Figure 11

Projected annual payments from the UK public service pay-as-you-go pension schemes continued

Pension payments as a percentage of projected Gross Domestic Product



Source: National Audit Office analysis of data used by the Government Actuary's Department to support the Treasury's Long-term public finance report of December 2009

NOTE

Payments in each of the five categories are for the whole of the UK.

Assumptions behind pension projections

3.8 Projections are subject to a range of assumptions, the effects of which are significant and increase over time. The Treasury, after obtaining advice from the Government Actuary's Department, sets the assumptions for its long-term projections of pension payments as part of its broader responsibility for setting appropriate, coherent and consistent assumptions across its *Long-term public finance reports* and other projections. Most of the pension payments assumptions are common to all schemes, in contrast to the more scheme specific assumptions which underpin the yearly calculation of scheme liabilities (Appendix 5). The following are the four most significant assumptions for the long-term spending projections.⁷

- The pension entitlements and age distribution of current and deferred pensioners are known, so projections rely primarily on assumptions about the life expectancy of public service employees and pensioners, which determine the length of time for which pensions are expected to be paid (paragraphs 3.9 to 3.11).
- Final pension entitlements for current staff are linked to final salary, or to average salary covering past and future service, so the most significant projection assumption, in addition to life expectancy, concerns earnings growth in the public service workforce. This assumption is linked to wider assumptions about productivity and earnings growth (paragraphs 3.12 and 3.13).
- For future public service employees, further assumptions, in addition to life expectancy and earnings growth, cover the number of entrants, driven by expectations about workforce size (paragraphs 3.14 and 3.15).
- Projections also include allowance for potential savings from cost sharing and cost capping arrangements, which we will consider in more detail in our second report (paragraphs 3.16 to 3.17).

Life expectancy

3.9 Life expectancy determines the time over which pensions will be paid to pensioners and dependents in future years. Any improvement in life expectancy will increase the period over which pensions are paid and hence the total size of pension payments. Assumed life expectancies for the projections are typically 1.5 years higher than those in the general population to take account of the fact that people who are members of occupational pension schemes live longer on average than those who are not. They allow for future improvements in life expectancy in line with assumptions used by the Office for National Statistics in the latest UK national population projections. The Government Actuary's Department prepared alternative spending projections for the Treasury, based on higher and lower life expectancy assumptions chosen to be in line with high and low life expectancy projections from the Office for National Statistics (**Figure 12**).

⁷ This report considers the four most significant assumptions. Other assumptions made in the projections include rates of mortality at younger ages, the characteristics of new entrants, the extent to which retiring members opt for larger lump sums in return for lower pensions, and the numbers of ill health retirements.

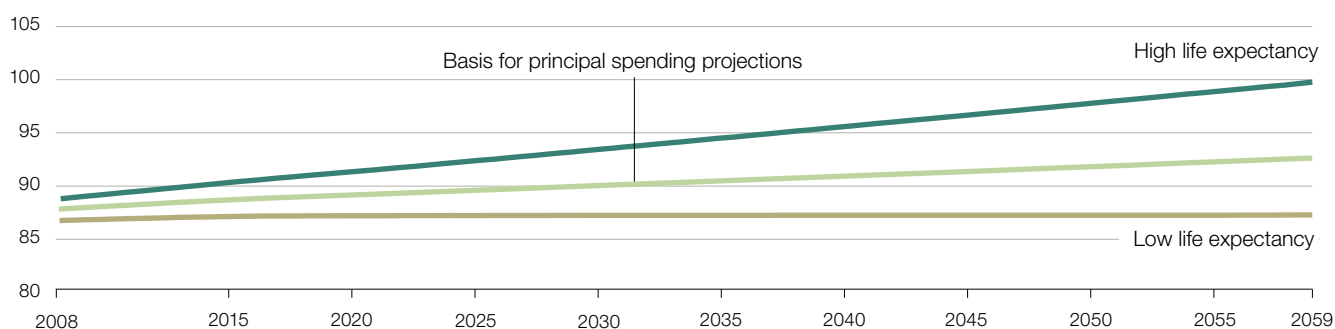
3.10 The effect, calculated by the Government Actuary's Department, of the higher life expectancy assumption, is that projected payments in 2059-60 rise to 1.72 per cent of GDP rather than 1.67 per cent (Figure 13 overleaf). The lower life expectancy assumption causes projected payments in 2059-60 to fall to 1.62 per cent of GDP. The percentages here are given to two decimal places solely to show the impact of changes in assumptions.

Figure 12

Life expectancy assumptions used in preparing UK public service pay-as-you-go pension payment projections

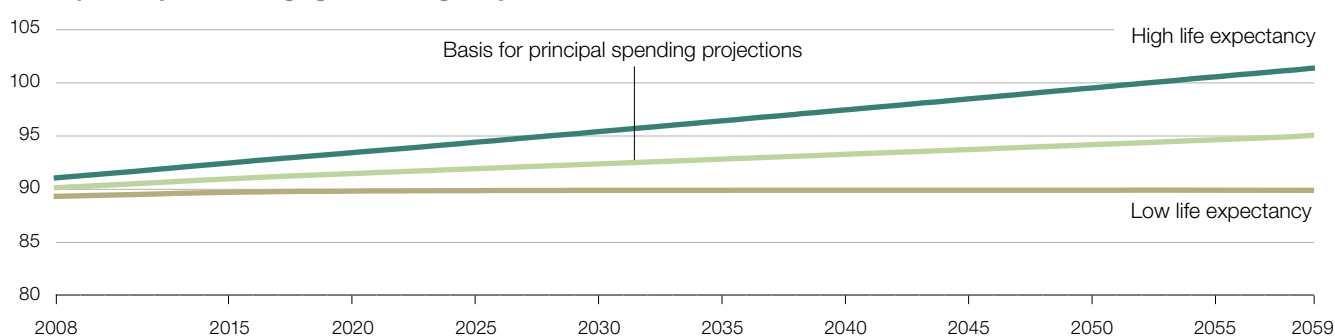
Men

Life expectancy on reaching age 65 in the given year



Women

Life expectancy on reaching age 65 in the given year



Source: Government Actuary's Department

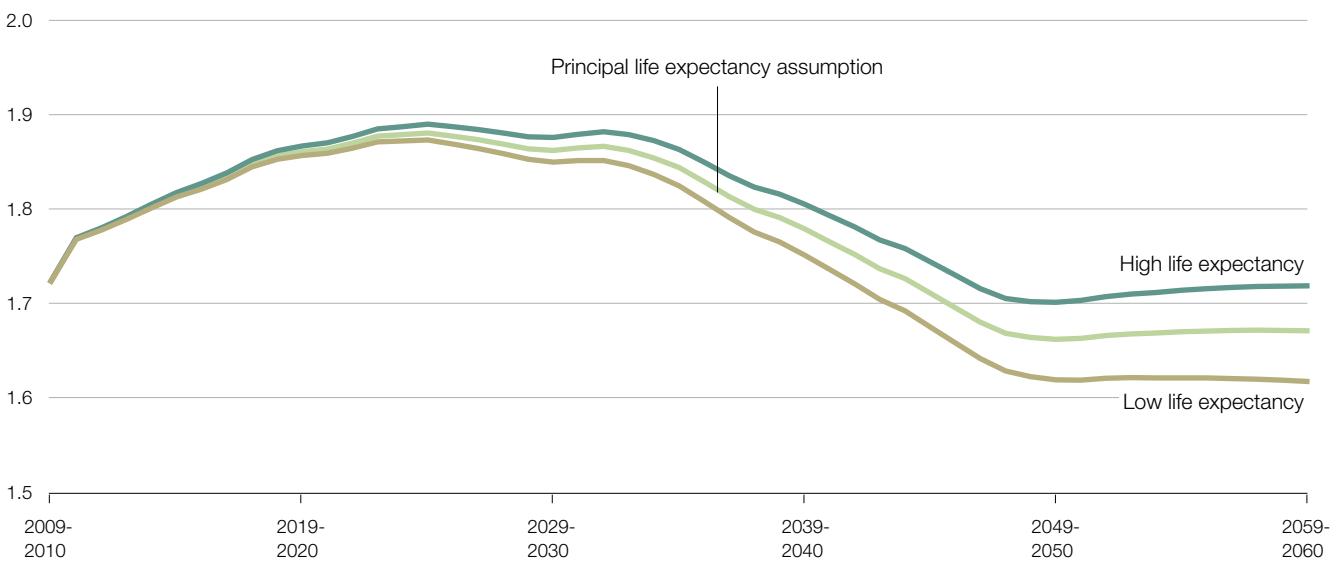
3.11 The Government Actuary’s Department’s December 2009 projections include, for the first time, allowance for the potential savings to the taxpayer as a result of cost sharing and cost capping, as discussed later in this report. The impact of these measures is to reduce the extent to which projected pension payments are sensitive to changes in life expectancy assumptions. Overall pension costs are, respectively, higher and lower under the higher and lower life expectancy assumptions, but so are the savings to the taxpayer resulting from cost sharing and cost capping. As a result, the increase or decrease in pension payments resulting from higher or lower life expectancy assumptions is less, after including allowance for cost sharing and cost capping, than it would be if cost sharing and cost capping were absent.

Earnings growth

3.12 In defined benefits schemes, earnings growth affects projected pension payments for current and future employees. Historically, earnings in the private and public sectors have increased in real-terms broadly in line with productivity. Productivity increased by an average of 2.1 per cent each year from 1964 to 2008, while real-terms earnings increased by an average of 1.9 per cent a year over the same period.⁸ Projections from the Government Actuary’s Department are based on an assumption of real-terms earnings growth of 2.0 per cent a year derived from an assumed 2.0 per cent annual productivity growth.

Figure 13
The impact of alternative life expectancy assumptions on UK public service pay-as-you-go pension payments as a percentage of Gross Domestic Product

Pension payments as a percentage of projected GDP



Source: National Audit Office analysis of data supplied by the Government Actuary’s Department

8 Based on analysis of Office for National Statistics data on historic retail price inflation, output per worker and average earnings.

3.13 Lower productivity growth causes pension payments to rise in relation to GDP because the consequent reduction to GDP is more than the reduction to pension payments. Projected payments reach 1.77 per cent of GDP in 2059-60 using a lower assumption of 1.75 per cent growth in productivity and real-terms earnings, compared to 1.67 per cent on the principal assumption of 2.0 per cent growth. Projected payments reach 1.58 per cent of GDP in 2059-60 using a higher assumption of 2.25 per cent growth in productivity and real-terms earnings (**Figure 14**).

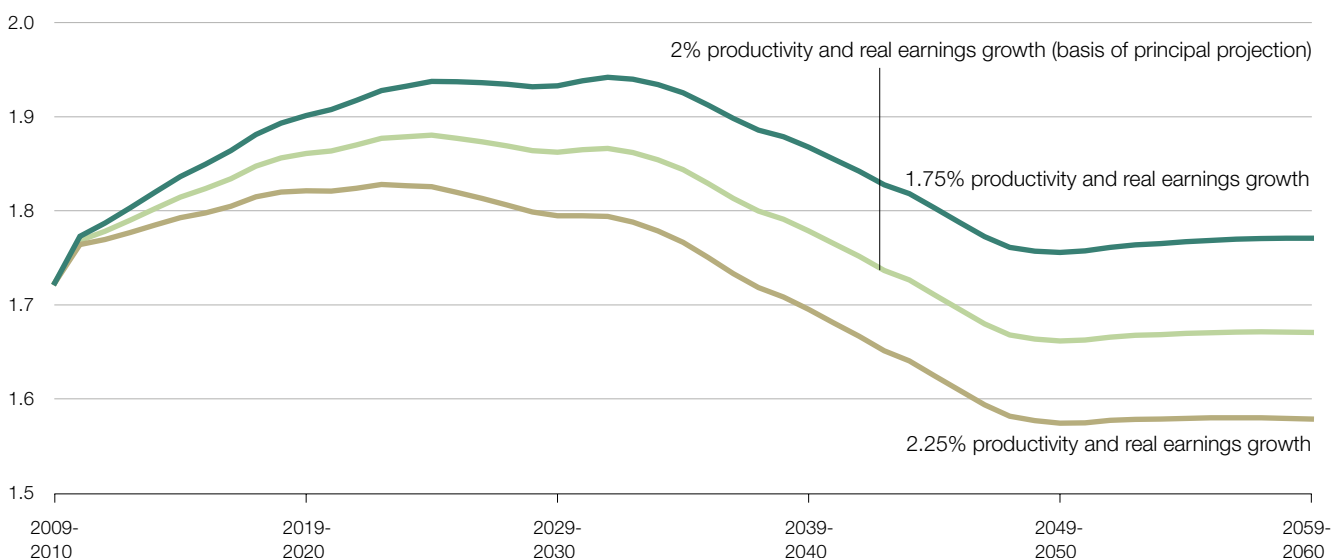
Workforce size

3.14 The projections are based on the assumption that overall employment, in aggregate across all relevant pension schemes, will remain at March 2008 levels. The Treasury told us that, while it is reasonable to expect provision of some services to grow in future periods, there may also be reductions in others. Without knowing what future policy will be, the Treasury position is that there is no clear rationale for assuming how the expected growth in some public services will affect the size of the workforce. The Treasury takes the view that such a 'constant policy' approach is in line with international best practice for long term projections so, after considering the possibility, it did not ask the Government Actuary's Department to prepare projections to illustrate the impact of alternative assumptions about the future size of the public service workforce.

Figure 14

The impact of alternative productivity and earnings growth assumptions on UK public service pay-as-you-go pension payments

Pension payments as a percentage of projected Gross Domestic Product



Source: National Audit Office analysis of data supplied by the Government Actuary's Department

3.15 In our view, analysis of the impact of different workforce growth (or contraction) assumptions is needed in order to understand the potential impact on public service pension costs. It is clear that larger numbers of older people will add to demand on services, but less clear where a reduction in demand might occur. Zero employment growth, were it to be reflected across the whole public sector and if the earlier Treasury assumption about total UK workforce growth holds true, would mean a substantial relative reduction of public service employment. It would fall to 16.3 per cent of all employment by 2059-60 from 19.5 per cent in early 2008 and from the latest 2009 figure of 21.1 per cent.⁹ A constant public service workforce runs counter to recent trends, with the number of employees in the four largest UK public service pay-as-you-go pension schemes rising by 21 per cent in the period 1999-2000 to 2008-09, although short term expectations are of a reducing workforce. Given these uncertainties, we consider there is a need for analyses to test the sensitivity of projections to changes in the constant workforce assumption.

Cost sharing and cost capping

3.16 Recent changes to UK public service pay-as-you-go pension schemes include cost sharing and cost capping, the principle of which is that certain increases in scheme costs are shared in future between employers and employees. Sharing is equal up to the level of an employer contribution rate cap, with any further increases falling entirely on employees. Cost sharing and cost capping have been incorporated into the rules of the civil service, NHS and teachers' schemes. Any increased costs that fall to employees would result in increased employee contributions, reduced pensions for future service, or a combination of both. The weighting between increased contributions and reduced pensions would be decided at the time, and evidence of a typical outcome has not yet emerged.

3.17 The inclusion in pension payments projections of an allowance for potential savings to the taxpayer as a result of cost sharing and cost capping is the most significant change compared to previous projections. The assumption is that two-thirds of employees' share of increased future pension costs is taken as reduced future pensions, and one-third as increased employee contributions. Our second report will examine this area in detail.

9 <http://www.statistics.gov.uk>.

Appendix One

Methodology

Method	Use in the report
Analysing published resource accounts from the four largest pay-as-you-go public service pension schemes	Analysis of payments and contributions over the last ten years presented in Part 2
Analysing unpublished material and calculations from the Treasury and the Government Actuary's Department	Presentation of projections over the next fifty years in Part 3
Analysing unpublished data from the four largest pay-as-you-go public service pension schemes	Pensions analysis presented in Appendix 4 and additional material required for Part 2
Using actuarial expertise from PricewaterhouseCoopers	Advice on sources of information and context, although final responsibility for the content of the report rests wholly with the National Audit Office
Using RPI rates published by the Office for National Statistics to adjust prior year cash amounts to 2008-09 prices ¹⁰	Adjustment to consistent real-terms amounts throughout the report
Adjusting pension projections prepared by the Government Actuary's Department, in constant price terms, to alternative presentations in constant earnings terms and as a proportion of GDP, on the basis of assumptions and estimates prepared by the Treasury and Government Actuary's Department	Presentation of projections over the next fifty years in Part 3
Interviews with staff from the Treasury and the Government Actuary's Department	Obtaining unpublished material and clarifying our understanding of it

¹⁰ <http://www.statistics.gov.uk>.

Appendix Two

Pension schemes covered by the Treasury's projections

1 The Treasury advised us that its spending projections for UK public service pay-as-you-go pension schemes cover the following.

The largest four schemes

Armed Forces Pension Scheme (covering the United Kingdom)

Principal Civil Service Pension Scheme (for England, Scotland, Wales and some employees in Northern Ireland)

NHS Pension Scheme (for England and Wales)

Teachers' Pension Scheme (for England and Wales)

Other schemes related to the largest four

Principal Civil Service Pension Scheme (Northern Ireland)

NHS Superannuation Scheme (Scotland)

Health and Personal Social Services Northern Ireland Superannuation Scheme

Scottish Teachers' Superannuation Scheme

Northern Ireland Teachers' Superannuation Scheme

Other larger schemes

Police Pension Scheme

Firefighters' Pension Scheme

Other smaller schemes

Department for International Development Overseas Superannuation Scheme

Judicial Pensions Scheme

Research Councils' Pension Schemes

United Kingdom Atomic Energy Authority Pension Schemes

Source: HM Treasury

2 The Treasury told us that, in addition to the schemes mentioned on the previous page, 'the cashflow projections cover dozens of smaller schemes and many established to cover only one senior appointment'. The Government Actuary's Department estimates that the liability in respect of these schemes is less than one quarter of one per cent of the total. The basis for this estimate is the Treasury note *The cost of public service pensions 2002-03*, available in the House of Commons Library. Given the size of these schemes relative to the total liability, the estimate is not regularly reviewed. Neither the Treasury nor the Government Actuary's Department could provide us with a complete list of the smaller schemes covered by the projections.

3 The Treasury's projections of all UK public service pay-as-you-go pension schemes deal with many schemes in an approximate manner without carrying out separate projections. The Government Actuary's Department, on behalf of the Treasury, prepares the overall projection in the following sequence.

- Projections of the five largest five schemes, covering the police as well as the armed forces, civil service, NHS, and teachers, uplifted as necessary to cover the whole of the UK.
- A UK projection for the firefighters, which, on the basis of statistics compiled by the Chartered Institute of Public Finance and Accountancy, is assumed to be 21 per cent of the projection for the police.
- A projection for other UK public service pay-as-you-go pension schemes, assumed to be 1.9 per cent of the aggregate cash flows from the civil service, NHS, and teachers' schemes, based on the ratios of scheme liabilities reported at 31 March 2006.

Appendix Three

The main features of the four largest UK public service pay-as-you-go pension schemes

Scheme	Date employee joined the scheme ¹	Normal pension age	Pension basis	Pension accrual rate ²	Lump sum on retirement	Employee contribution rate (%)
Armed forces	Before April 2005	55	Final salary	1/69th changing to 1/91st for years service in excess of 22 ³	3 x annual pension	Nil
	April 2005	55	Final salary	1/70th	3 x annual pension	Nil
Civil service	Before October 2002	60	Final salary	1/80th	3 x annual pension ⁵	1.5
	October 2002	60	Final salary	1/60th	Optional in exchange for reduced pension	3.5
	July 2007	65	Career average salary	2.3 (equal to 1/43rd)	Optional in exchange for reduced pension	3.5
NHS	Before April 2008	60	Final salary ⁴	1/80th	3 x annual pension ⁵	5 to 8.5, dependent on pay range
	April 2008	65	Final salary	1/60th	Optional in exchange for reduced pension	5 to 8.5, dependent on pay range
Teachers	Before January 2007	60	Final salary	1/80th	3 x annual pension ⁵	6.4
	January 2007	65	Final salary	1/60th	Optional in exchange for reduced pension	6.4

Source: National Audit Office

NOTES

- Public service pension schemes have been subject to various changes over recent years, applicable to new joiners from the date shown.
- The pension accrual is the proportion of final or average salary, multiplied by the number of years service, which determines an employee's annual pension entitlement.
- The accrual rate for officers joining before April 2005 is 1/56th of final salary for the first 16 years of service, then 1/90th for subsequent years.
- Pensions for General Practitioners in the NHS scheme are based on career average salaries.
- Existing staff in the civil service, NHS and teachers' schemes have the option to increase their lump sum in exchange for a reduced pension.

Appendix Four

The distribution of pensions paid from the four largest UK public service pay-as-you-go schemes

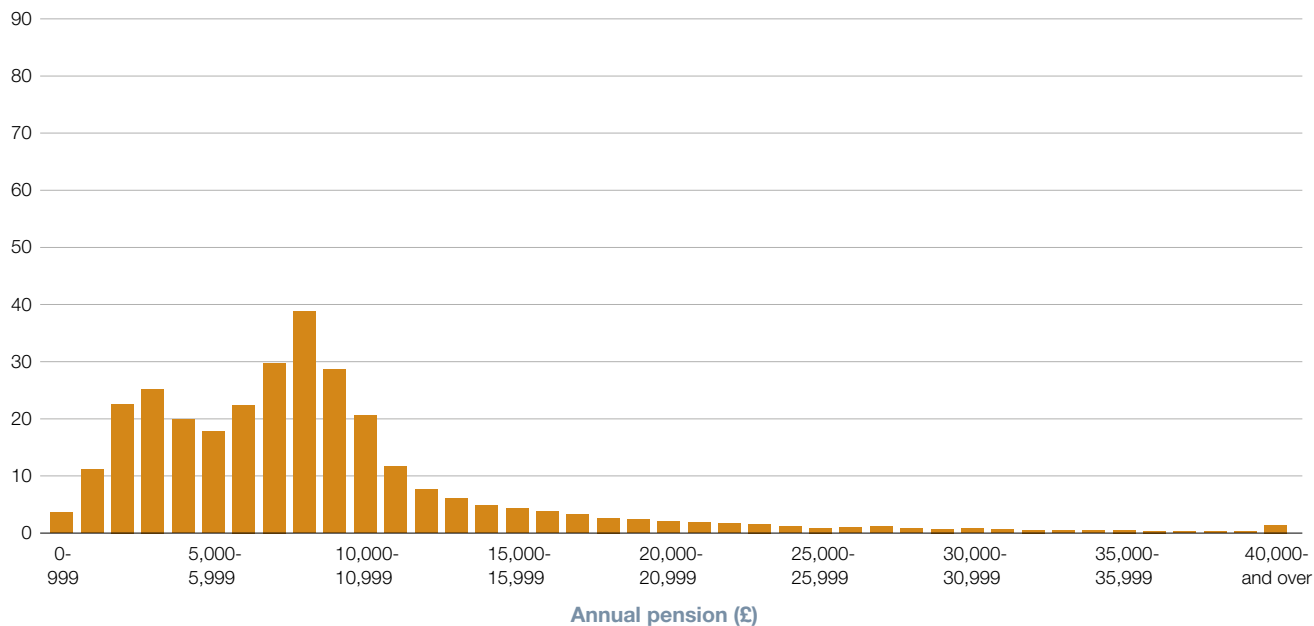
1 The graphs overleaf show the distribution of pensions paid by the four largest UK public service pay-as-you-go pension schemes. The civil service and NHS schemes have the greatest concentration of pensions below £5,000. The teachers' scheme shows that smaller pensions are predominantly linked to short service, but equivalent data were not available to examine this linkage for other schemes. The NHS scheme has the largest number of pensions over £40,000.

2 In order to make results more meaningful, the graphs show only full pensions to retired pensioners, not pensions to their surviving dependents, which are reduced to varying extents. In contrast, the average pensions in Part 2 combine pensions to pensioners and surviving dependents in order to give a complete picture of cost.

The distribution of pensions paid from the four largest UK public service pay-as-you-go schemes

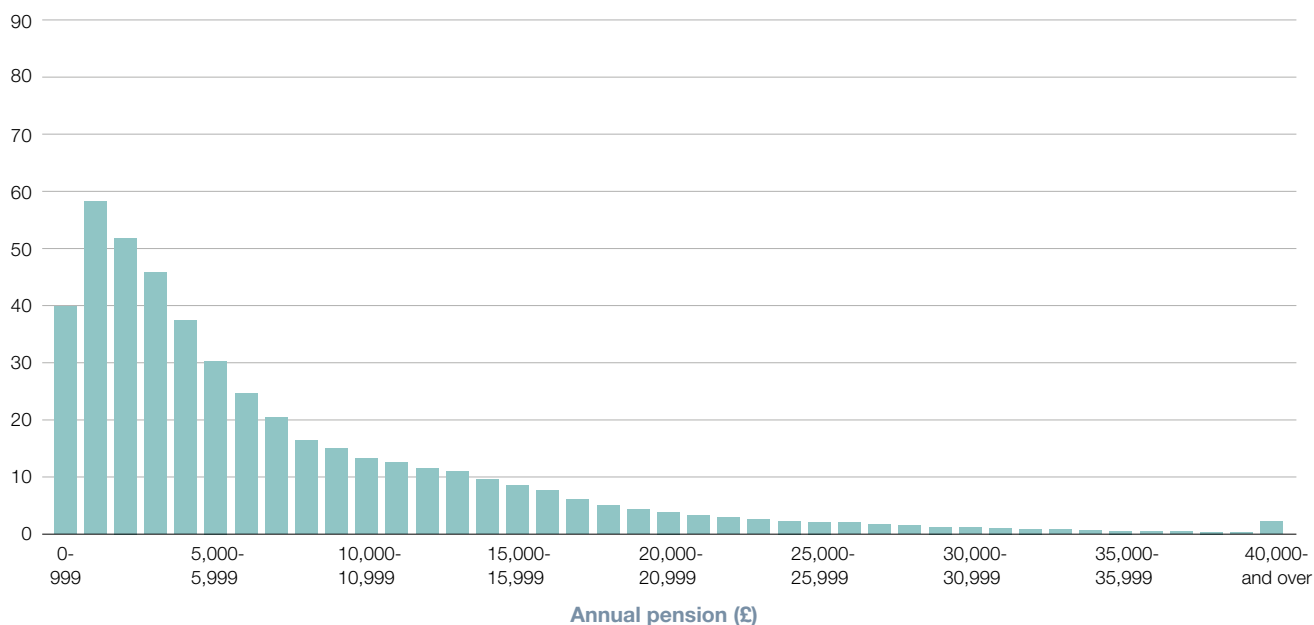
Armed forces pension scheme

Number of pensioners (thousands)



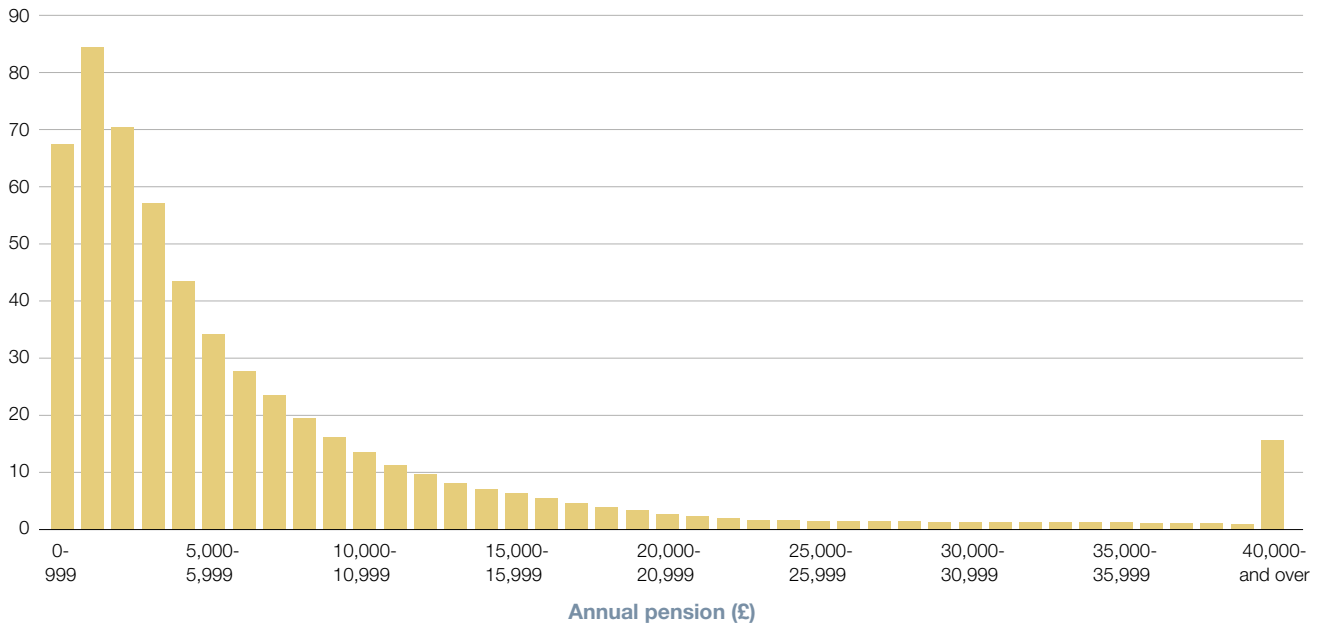
Civil service pension scheme

Number of pensioners (thousands)



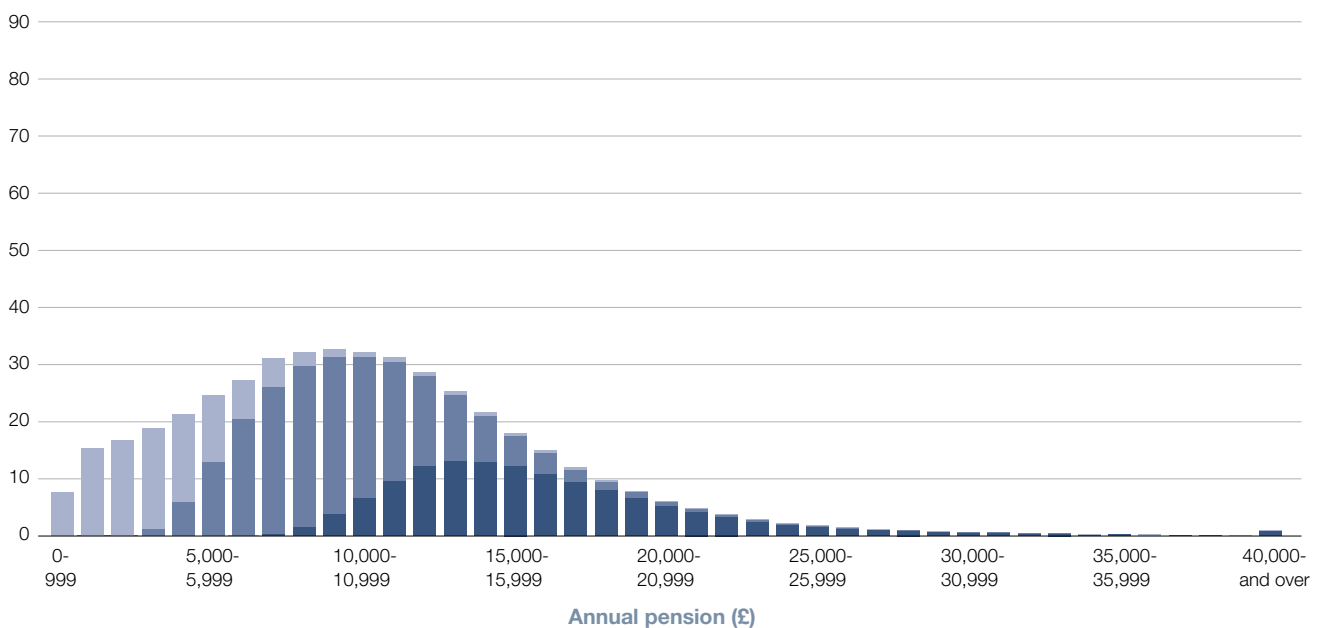
NHS pension scheme

Number of pensioners (thousands)



Teachers' pension scheme

Number of pensioners (thousands)



- Based on over 30 years qualifying service
- Based on 15 to 30 years pensionable service
- Based on up to 15 years pensionable service

Source: National Audit Office analysis of data provided by the pension scheme managers

Appendix Five

Liability calculations for resource accounts

1 Financial statements that cover pension schemes include a measure of the ongoing obligation to pay pensions into the future expressed as a single figure in today's money. This 'present value' pension liability is, in principle, the estimated amount of money that would need to be set aside now to provide for the pension payments when they arise, which may be up to seventy years in the future. The liability reflects entitlements earned to date so, unlike projections presented in Part 3 of this report, does not include payments relating to future service. The liability is not a sum of money that would ever have to be paid at one time. It is, rather, a representation of a series of future payments as a single figure. It is a measure of the rights to pensions that public service employees have already earned.

2 The latest figures for present value liabilities, as reported in the 2008-09 resource accounts of the four largest UK public service pay-as-you-go pension schemes featured in Part 2, are set out below.

Pension scheme	Reported liability as at 31 March 2009 (£bn)
Armed Forces	91.0
Civil Service	115.7
NHS	199.5
Teachers	168.6
Total	574.8

Source: Pension scheme resource accounts

3 The four schemes account for most of the liabilities of all UK public service pay-as-you-go pension schemes, for which payment projections are presented in Part 3. At 31 March 2008, the latest date for which aggregate figures across all UK public service pay-as-you-go pension schemes are available, the four schemes reported combined liabilities representing 79 per cent of the total for all such schemes.¹¹

¹¹ The Treasury published total liability figures as at March 2008, in the *Long-term public finance report of 9 December 2009*. The Treasury does not yet have the equivalent figures available for March 2009.

4 The pension liability is normally less than the total of projected future payments because money set aside now is expected to benefit from income and capital growth. The annual rate by which a future payment is reduced to give its present value is the 'discount rate'. Changes in real-terms discount rates have large impacts on the value of liabilities. Financial reporting standards require pension liabilities disclosed in companies' statutory accounts and public service schemes' resource accounts to use a discount rate equal to the return on high quality corporate bonds of appropriate term and currency. This is normally taken to mean at least AA-rated bonds.

5 Projected pension payments and their representation as a single present value liability both depend on a range of assumptions, but the liability calculation depends additionally on the discount rate assumption. Changes in the discount rate lead to large fluctuations in the size of pension liabilities, but have no effect on projected pension payments. For example, the discount rate increased by 0.7 per cent in the year to 31 March 2009 for the four largest schemes. There were no other changes that year to key financial assumptions underlying liabilities, but the discount rate change alone reduced the total liability across all four schemes by approximately £73 billion.

6 In addition to the effect of the discount rate assumption, pension liabilities change each year for other reasons. The overall change in liabilities from one year to the next, which could be an increase or a decrease, results from the combination of all effects, including any change in the discount rate. Other factors changing liabilities each year include the following.

- Current employees earn further pension rights each year, increasing liabilities by amounts designed to measure the increased value of employees' pensions.
- Pension payments from the schemes each year decrease outstanding liabilities by amounts exactly equal to the payments.
- An 'interest cost' increases liabilities every year, without changing expected pension payments, because each year's pensions, other than those made in the year, are one year closer to payment than in the previous year's accounts. Any money set aside for them now would therefore benefit next year from one year's less income and capital growth. The interest cost for the four largest schemes was £32 billion in 2008-09.
- Liabilities can increase or decrease each year if what happens in the year differs from what would have been expected based on assumptions made at the start of the year.
- Changes in assumptions other than the discount rate, for example assumptions about life expectancy, can increase or decrease liabilities.

7 Reported liabilities are not a direct representation of the individual pension schemes' shares of projected pension payments for past service presented in Part 3 for three main reasons. First, the projections include estimates of pensions to be earned by future service while the liabilities cover only pensions already earned. Second, the projections stop at 2059-60 whereas the different calculation process used for liabilities has no such cut-off. Third, the common set of assumptions for projecting pension payments, set by the Treasury after obtaining advice from the Government Actuary's Department, differ in some areas from the key assumptions used for estimating individual scheme liabilities, as set out on the opposite page.¹²

- The earnings growth assumption of 1.5 per cent in real terms for calculating scheme liabilities in resource accounts compares with 2.0 per cent for projecting pension payments, discussed in Part 3. The earnings growth assumption for resource accounts is in line with assumptions for the valuations used to set contribution rates, and is well within the range used by private sector schemes in their financial accounts. The assumption used for projections is equal to the productivity growth assumption used across the whole of the Treasury's *Long-term public finance report* of December 2009. The higher assumption, if applied to individual scheme calculations, would increase liabilities. The lower assumption, if used for projections, would decrease payments expressed in constant prices but increase them when expressed in constant earnings or as a proportion of Gross Domestic Product.
- Life expectancies used for determining liabilities vary across the pension schemes. The single set of life expectancies used for projections falls within the range of life expectancies across the schemes so is broadly consistent.

8 Public service pension liabilities are calculated at regular intervals as part of the process of determining contribution rates in addition to the calculations used for resource accounts. The underlying assumptions used for determining contributions, in particular the discount rate, differ from those underlying calculations of resource account liabilities. Our second report will cover this process in more detail as it will be significant in determining the future impact of cost sharing and cost capping.

¹² Other scheme specific assumptions include rates of early retirement, ill-health retirement, withdrawal from service and, in addition to the underlying allowance for earnings growth, scales to allow for incremental and promotional pay rises.

Financial assumptions	For the liabilities of the four schemes			Equivalent assumptions for the projections
Discount rate	6.0 per cent annually	3.2 per cent above price inflation		Not applicable
Earnings growth	4.3 per cent annually	1.5 per cent above price inflation		2.0 per cent above price inflation
Price inflation	2.75 per cent annually			Not applicable ¹
Cost sharing and cost capping	Not applicable			Included

	Life expectancy for a person who reaches age 60	For the liabilities of the four schemes (covering normal retirements but excluding ill health retirements)			Equivalent assumptions for the projections (covering all retirements)
		NHS, teachers and officers in the armed forces	Civil service	Non-officer ranks in the armed forces	
Currently aged 60	Males	88.6	87.9	86.5	87.3
	Females	91.8	89.9	89.7	90.1
Currently aged 40	Males	90.2	89.9	88.3	89.4
	Females	93.3	91.8	91.4	92.1

Source: Government Actuary's Department

NOTE

The price inflation assumption does not have a material impact on projections prepared by the Government Actuary's Department because they are presented in constant price terms before being adjusted, where necessary, to constant earnings terms or as a proportion of projected Gross Domestic Product.

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