GOVERNMENT ACTUARY'S DEPARTMENT

Consultation by Government Actuary's Department

Review of contracted-out rebates for 2012 to 2017

23 August 2010

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Dear Sir or Madam

Consultation on contracted-out rebates for 2012 to 2017

The Government Actuary's Department is pleased to publish a consultation document on the proposed assumptions to inform my advice on the calculation of contracted-out rebates for the period 2012 to 2017.

The contracted-out rebate is set having regard to the cost of providing benefits of equivalent actuarial value to the state second pension that is forgone by workers who are contracted-out. In respect of defined benefit schemes, I am required to report on the changes in factors affecting the appropriate level of the rebate. It has also become established practice for the Government Actuary's Department to advise on the level of the rebate after public consultation on the assumptions that should be used to calculate it.

In our consultation document we put forward possible assumptions for determining the rebate and invite comments on our proposals. Our objective is to collect evidence for appropriate assumptions.

Written responses should reach us no later than 15 November 2010 and be sent to:

Joanne Meusz
Government Actuary's Department,
Finlaison House,
15-17 Furnival Street,
London EC4A 1AB.

Email: rebate.consultation.2010@gad.gov.uk

I look forward to your response.

Yours faithfully

Trevor Llanwarne

Government Actuary

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1 About this consultation

1.1 The Government Actuary is required to review the National Insurance rebates provided to contracted-out pension schemes, at least every five years. The next review is now due and covers the period April 2012 to April 2017. The purpose of the review is to identify changes in the factors affecting the appropriate level of the rebate. The rebate is set having regard to the cost of providing benefits of equivalent actuarial value to the state second pension that is forgone by workers who are contracted-out.

1.2 In order to conduct the review it is important to have a public consultation on the key assumptions underlying the calculation of the rebate. This document is designed to start this process.

1.3 There are two new features that will affect this review:

- it has been legislated that contracting-out will be abolished on a defined contribution basis, expected to be from April 2012, and
- the Government Actuary intends that, rather than make a recommendation for the defined benefit rebate, he will set out three alternative approaches for calculating the rebate, suggesting a rebate value for each. The Secretary of State for Work and Pensions can then set the rebate percentage having considered the Government Actuary's advice.

1.4 The abolition of contracting-out on a defined contribution basis means that the focus of this consultation is on the defined benefit rebate.

1.5 We are consulting on the actuarial assumptions which might be used on three alternative approaches:

- a 'best estimate' basis,
- a 'typical funding' basis, and
- a 'gilts' basis.

1.6 In this consultation document, we put forward possible assumptions for each of the above valuation approaches and invite comments on these proposals. Our objective is to collect evidence for appropriate assumptions under each approach. We will then derive indicative rebate percentages on each basis, so that the Secretary of State can take his decision on the appropriate rebate with a good understanding of the range of possible values which might be adopted.

1.7 This document can be downloaded in pdf format from the GAD website at

http://www.gad.gov.uk/Documents/Pensions%20Policy%20&%20Regulation/Rebate_Consultation/Consultation_by_GAD-Review_of_contracted-out_rebates_2012-2017.pdf

We would appreciate it if responses could be submitted using the form at

http://www.gad.gov.uk/Documents/Pensions%20Policy%20&%20Regulation/Rebate_Consultation/Contracted-out_rebate_consultation_reply_form.doc

1.8 To enquire about this document, please contact:

Joanne Meusz
Government Actuary's Department
Finlaison House
15 – 17 Furnival Street
LONDON EC4A 1AB

Tel: 0207 211 2681

Email: rebate.consultation.2010@gad.gov.uk

1.9 Written responses to this consultation will be accepted by post or email to the above addresses. Please respond by 15 November 2010. A list of consultation questions appears in Appendix A.

1.10 Information provided in response to this consultation, including personal information, may be published or disclosed in accordance with the access to information regimes. These are primarily the Freedom of Information Act 2000 (FOIA), the Data Protection Act 1998 (DPA) and the Environmental Information Regulations 2004.

1.11 If you would like the information that you provide to be treated as confidential, please be aware that, under the FOIA, there is a statutory Code of Practice with which public authorities must comply and which deals with, among other things, obligations of confidence. In view of this it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding.

1.12 We will process any personal data in accordance with the DPA and in the majority of circumstances this will mean that your personal data will not be disclosed to third parties.

1.13 The Government is committed to effective consultation: consultation that is targeted at and easily accessible to those with a clear interest in the policy in question. Effective consultation brings to light valuable information which the Government can use to design effective solutions. Put simply, effective consultation allows the Government to make informed decisions on matters of policy, to improve the delivery of public services, and to improve the accountability of public bodies.

1.14 Where practical this consultation complies with the Government's Code of Practice on Consultation. The Government's seven consultation criteria are listed in Appendix B.

2 Deriving the rebate

Legal basis and additional DWP requirements

2.1 The Government Actuary is required to produce a report to Parliament (in respect of defined benefit schemes) which discusses changes in the factors affecting the cost of providing benefits of an actuarial value equivalent to the benefits forgone by contracted-out staff. The full legal basis is set out in Appendix C.

2.2 The main relevant changes since the previous review may include:

- the profile of members of contracted-out defined benefit schemes is changing as a result of continuing scheme closures to new entrants and new accrual,
- state pension age has been raised for many people, which reduces the amount of state second pension forgone by contracted-out members each year, and means that it is deducted later,
- expectations of workers' longevity continue to rise,
- a new funding regime for defined benefit schemes is now fully in place (deriving from Pensions Act 2004),
- actuarial opinion on appropriate valuation methods continues to develop,
- economic conditions are noticeably different, with possible implications for expected future investment returns and inflation, and
- the Chancellor announced at the June 2010 Budget that the additional state pension will be indexed in future by reference to the Consumer Prices Index, rather than by the Retail Prices Index.

2.3 The Pensions Act 2007 and the Pensions Act 2008 contain a number of further reforms to the state second pension. These affect the state second pension, rather than the benefits forgone by contracted-out staff. As such, these reforms do not affect the appropriate level of the contracted-out rebate.

Question 1
Do you agree that we have correctly identified the main relevant changes in the factors affecting the cost of providing benefits of an actuarial value equivalent to the benefits forgone by staff who are contracted-out on a defined benefit basis? What other factors do you consider relevant?

2.4 Given the abolition of contracting-out on a defined contribution basis, this review is focussed on the rebate for defined benefit schemes, or 'COSRS'[1] in the jargon. See section 7 for further discussion of outstanding defined contribution issues.

[1] A 'COSRS' is a contracted-out salary related scheme – an occupational pension scheme which is contracted out on a salary-related basis, that is by providing benefits which are broadly equivalent to or better that those specified under the reference scheme test.

2.5 In addition to commenting on the changes to the pensions environment, it has become established practice for the Government Actuary to provide advice on the appropriate level of the rebate. Hitherto, the Government Actuary proposed a single rate. At the previous review, the then Secretary of State rejected the Government Actuary's proposal and implemented a lower rebate for defined benefit schemes, citing 'the present fiscal circumstances' and 'the current consideration of pension policy'. At this review, the Government Actuary intends to offer advice on a range of possible approaches to setting the rebate percentage, so that the Secretary of State can make his decision with an understanding of the range of possible approaches and outcomes.

Valuing the benefits

2.6 To derive a rebate we have to identify the benefits in the state second pension scheme which are forgone by contracted-out staff. Effectively, these are calculated in the same way as previously under the State Earnings Related Pension Scheme (SERPS). That is, a percentage of band earnings, payable from state pension age, revalued in deferment in line with average earnings growth and increased in payment in line with prices inflation, and with contingent spouse's benefits of up to 50% of the contributor's pension. The measures of earnings growth and prices inflation are set out in orders.

2.7 The Government Actuary proposes that he advise on a range of three alternative valuation approaches. This will illustrate a range of potential rebate values. While there are many different approaches to valuing pension benefits, we have focussed on three for the purposes of this exercise. These are:

- a 'best estimate' basis,
- a 'typical funding' basis, and
- a 'gilts' basis.

2.8 A prudent basis might replicate the assumptions that insurance companies use to price annuities. However, these are not published. Buy-out terms are also influenced by market forces as well as the expected cost of providing benefits, and have been subject to considerable volatility in recent years.

2.9 We are not seeking to replicate buy-out terms with our 'gilts' basis, but to suggest a basis which a scheme might use itself to minimise its risk of having insufficient funds to pay the specified benefits.

2.10 The features of these three approaches are discussed below. While we have tried to give the three approaches sensible and meaningful names, as above, readers should avoid inferring more into the choice of name than is justified by the explanations given. The three bases can be rationalised as follows:

- The 'best estimate' basis is intended to lead to a rebate which is considered equally likely to deliver benefits which are more or less than the state second pension forgone as a consequence of being contracted-out. This basis should reflect typical investment strategies in funded contracted-out defined benefit pension schemes. Thus, the rebate on the 'best estimate' basis uses estimates of the relevant assumptions which do not include any material margins of prudence, and which are applied in a way which reflects the actual investment strategies adopted by such schemes,

- A 'typical funding' basis should include margins of prudence (relative to the 'best estimate' basis) which are consistent with the regulatory regime imposed by the Pensions Act 2004 and the Pensions Regulator's guidance. Thus, the rebate on the 'typical funding' basis represents the amount which funded defined benefit schemes would typically hold in practice in order to cover benefits of equivalent actuarial value to those forgone as a result of contracting-out (where the actuarial value is measured in the same way as technical provisions are calculated), and
- The 'gilts' basis is intended to lead to a rebate which would allow a contracted-out defined benefit pension scheme to provide benefits equal to those forgone with a high degree of certainty, by investing in gilts. It does not mirror the cost of purchasing annuities from an insurance company, nor include any additional reserves of capital to meet extreme adverse outcomes. Thus, the rebate on the 'gilts' basis represents the amount which funded defined benefit schemes could hold in order to cover benefits of equivalent actuarial value to those forgone as a result of contracting-out, if they adopted a relatively low risk investment strategy based on gilts.

Question 2
Do you agree that we are planning to advise on a sufficient range of bases? Please suggest, with reasons, any additional basis that you think that we should include. In particular, do you consider that extra information would be provided by inclusion of an 'accounting' basis?

2.11 This consultation document suggests assumptions which might be adopted under each of the three approaches, and provides an estimate of the rebate which would emerge on that basis. We are inviting respondents to provide evidence-backed input on the choice of suitable assumptions.

2.12 Based on our suggested assumptions, the derived rebates would be:

- 4.7% to 4.9% on a 'best estimate' basis,
- 6.0% on a 'typical funding' basis, and
- 10.1% on a 'gilts' basis.

2.13 The rebates shown above allow for pension increases in line with CPI. If pension increases had remained in line with RPI these rebates would be 5.1% to 5.4%, 6.7% and 11.3% respectively.

2.14 The rebate percentages are of earnings between the Lower Earnings Limit and the Upper Accrual Point. At the previous review the Government Actuary proposed a rebate of 5.8%, but the Secretary of State decided to set the level at 5.3%. This was split 1.6% employee and 3.7% employer.

2.15 The rebates derived from these three assumption sets illustrate some possible outcomes of the rebate review. A rebate based on 'best estimate' assumptions is expected to be sufficient on average to cover the cost of providing benefits equivalent to the state second pension forgone by contracted-out workers.

2.16 A rebate based on 'typical funding' assumptions is expected to be more than sufficient on average to cover the cost of providing benefits equivalent to the state second pension forgone by contracted-out workers. On average, it would allow scheme sponsors to cover such benefits without providing additional support in the short term to cover the prudential requirements of the funding regulations.

2.17 A rebate reflecting the 'gilts' basis is expected to be sufficient on average to allow a scheme to adopt a low risk investment strategy and still cover the forgone state benefits without the sponsor having to provide additional financial support.

2.18 The indicative rebate values in paragraph 2.12 above have been derived using assumptions and methodologies which recognise the practice of funded private sector pension schemes. The rebate also applies to members of unfunded public sector schemes (who comprise a material percentage of members in contracted-out schemes). While a different rationale could be advanced for such schemes, we have not considered this further at this stage, since the contracting-out of public sector schemes does not result in cashflow to or from the Government.

2.19 Contracted-out public servants are affected by the level of the rebate which accrues to employees, however, this is a decision taken by the Secretary of State on broader policy grounds without the need for actuarial advice.

Impact on contracted-out workers and schemes

2.20 The rebate is derived having regard to the average contracted-out worker.

2.21 For each individual contracted-out worker, the only direct effect of the review is if the employee portion of the rebate changes. Neither the state second pension nor company pension is affected directly by the rebate review.

2.22 For company schemes, and the sponsoring employers, the direct effect of the review is that the rebate they receive may change. It does not affect the pensions they are committed to provide. However, indirectly, the company scheme is effectively substituting for part of the state pension. That is, part of the company pension can be considered as being a replacement for the state benefits forgone, for which the scheme (and worker) receive the rebate in compensation.

2.23 The attractiveness of contracting-out to employers depends on the balance between the state pension forgone by contracted-out workers, and the rebate received in compensation. While different employers will have different views on the adequacy and attractiveness of the rebate, it is clear that the rebate will be less attractive to employers with a workforce which is older on average than the general contracted-out population, since pensions are generally more expensive to provide for older workers.

2.24 At previous reviews, a margin was included (a loading of 7.5% to the proposed rebate) in order to address issues like this. The proposed rebates were a little higher than otherwise, and this would have been some help to employers with 'expensive' schemes, whatever the reason.

2.25 The rebates derived under the proposed three methodologies do not include any such margin. The approach that we are adopting for this review means that the Secretary of State will be presented with a range of possible rebates and the rationale underlying them (in particular the level of prudence). It is anticipated that, in this context, he can take into account issues such as cost variations between schemes.

Deriving the assumptions

2.26 A number of financial, demographic and other assumptions may be required in order to derive a rebate on any given basis. These are covered in sections 3, 4 and 5.

2.27 We hope that this consultation will help us refine our proposed assumptions for each basis. We intend that by consulting on three different and distinct bases, respondents will be encouraged to provide constructive evidence-based comments.

3 Financial assumptions

3.1 The key financial assumptions that are required are discount rates based on:

- the expected return on appropriate investments after state pension age (SPA) in excess of annual increases on the state benefits forgone,
- the expected return on appropriate investments before state pension age in excess of the revaluation of earnings factors on state benefits forgone (by reference to national average earnings growth), and
- the expected nominal return on appropriate investments before state pension age (used for the year immediately prior to retirement since there is no earnings revaluation of the state benefits forgone in that year).

3.2 Since the nominal rate (third bullet point above) is only used for the year immediately prior to retirement, it is the net rates (first and second bullet points above) which are most important in determining the cost of provision. The nominal discount rates are set based on assumed post-retirement asset allocations.

3.3 When formulating our suggested financial assumptions we have considered the time frame over which they will be applied, current market conditions as at end March 2010 and expectations of long run equilibriums.

Question 3
Our proposed financial assumptions are influenced by market conditions as at end March 2010. Given that the rebates calculated will be applied in the future, do you consider it appropriate for us to update the financial assumptions when we finalise our report?

3.4 Evidence in respect of the financial assumptions is contained in Appendix D.

3.5 When deriving the 'best estimate' assumptions we have considered the typical asset allocation of a funded defined benefit pension scheme. Having regard to the evidence set out in Appendix D, we have assumed the following:

Pre-retirement asset allocation (A differing asset allocation has been assumed dependent on term to SPA)	
Just before SPA	60% gilts (30% index linked, 30% fixed interest) 40% corporate bonds
10 years to SPA	Fully invested in equities 10 years from state pension age, switching to 60% gilts (30% index linked, 30% fixed interest), 40% corporate bonds over the remaining 10 years to state pension age. On average this translates approximately to 50% equities, 30% gilts and 20% corporate bonds over a 10 year term to state pension age.

Over 25 years to SPA	Fully invested in equities 25 years from state pension age, switching from this to 60% gilts (30% index linked, 30% fixed interest), 40% corporate bonds over the last 10 years to state pension age. On average this translates approximately to 80% equities, 12% gilts and 8% corporate bonds over a 25 year term to state pension age

Post-retirement asset allocation	
	60% gilts (30% index linked and 30% fixed interest) and 40% corporate bonds

Question 4
Do you agree with the asset allocation underpinning our calculation of the 'best estimate' discount rates? If not, what alternative asset allocations would you suggest (please provide a rationale and evidence)?

3.6 We have derived the suggested financial assumptions using a 'building block' approach based on:

- Consumer Prices Index (CPI),
- National Average Earnings (NAE),
- Gilt returns,
- Corporate bond returns,
- Equity returns,
- Investment expenses.

3.7 The figures we have used for the above building blocks are set out below. Evidence for these figures is given in Appendix D.

	'Best estimate'	'Typical funding'	'Gilts' basis
CPI (annual)	2.00% pa	n/a	n/a
CPI (multi-year)	2.00% - 2.50% pa (derived from above, see 3.8 - 3.11)	3.20% pa	3.50% pa
RPI (CPI + 0.75%)	2.75% - 3.25% pa	3.95% pa	4.25% pa
NAE (RPI + 1.50%)	4.25% - 4.75% pa	5.45% pa	5.75% pa
Index linked gilt return (RPI + 0.75%)	3.50% - 4.00% pa	n/a	n/a
Fixed interest gilt returns	5.00% pa	5.00% pa	5.00% pa
Corporate bond returns (Fixed interest gilts + 0.75%)	5.75% pa	n/a	n/a
Equity returns	7.40% - 7.90% pa	n/a	n/a
Investment expenses	0.12% pa to 0.15% pa (depending on term to SPA)	implicit in discount rates	0.10% pa

3.8 It can be seen that building blocks for the 'typical funding' and 'gilts' bases are point estimates. Where ranges are shown for the 'best estimate' assumptions, these have been derived from CPI (multi-year) assumptions for which possible different views and therefore a range exists.

3.9 Both economic consensus and the Office for Budget Responsibility's projections support an annual 'best estimate' CPI assumption of 2.0% pa for each year beyond the short-term. The 2.0% pa clearly represents the best estimate of the annual rate of increase (where there is equal likelihood of the actual rate being higher or lower) and we believe that this is an appropriate assumption to make. However, it is important to consider the equivalent cumulative rate over the future long-term. In order to do this, it is necessary to make an assumption about the distribution of future rates. The actual way that the state benefits forgone as a result of contracting-out change in response to inflation must also be taken into account.

3.10 When considering the cumulative rate of inflation over the future long-term, the two key factors are:

- The extent that the distribution of future inflation rates is 'skewed', rather than symmetrical. If the distribution is considered symmetrical, then whether it is considered symmetric on a linear basis or a different basis (for example, a logarithmic scale). We understand that a number of people hold the view that 'shocks to the system' can cause more significant increases to the rate of inflation than decreases, without prejudicing the annual 'best estimate' of 2.0% pa. For example, suppose in year 1 that the rate is 2.0%; in year 2 it doubles; in year 3 it reverts to 2.0%; in year 4 it halves; and in year 5 it reverts again to 2.0%. This would be consistent with a 2.0% pa assumption, but the cumulative rate over 5 years is 11.5% which is equivalent to an annual rate of 2.2%.
- The law and past practice provide for a floor of zero on increases to the benefits forgone as a result of contracting-out (they are not expected to reduce even if inflation falls below zero).

3.11 These factors suggest that it is necessary to set a 'best estimate' CPI assumption that represents the cumulative rate over the future long-term and is equivalent to an annual rate of 2.0% pa year on year. This cumulative rate will then inform the other assumptions. After rounding, 2.0% pa may be the appropriate assumption or it may be necessary to adopt a rate which could be in the range of 2.0% to 2.5% pa. Therefore, we are seeking views as to whether the 'best estimate' CPI assumption should be set at 2.0% pa or a rate in the range 2.0% to 2.5% pa. For illustrative purposes, we have considered 'best estimate' CPI assumptions of 2.0% pa to 2.5% pa in this consultation.

Question 5
Within the range 2.0% pa to 2.5% pa, what do you consider an appropriate 'best estimate' assumption for CPI. Please provide a rationale and evidence to support your view.

Question 6
Do you agree with our estimates of the building blocks for deriving the financial assumptions? If not, please provide alternative assumptions and evidence or a rationale to support these.

3.12 In determining the 'typical funding' discount rate for the periods before and after state pension age, a margin above the 'typical funding' fixed interest gilt return has been assumed. This margin aims to be reflective of the average margin employed by defined benefit pension schemes in setting their nominal discount rates for technical provisions. We have assumed that this margin is 0.35% pa post-retirement and 1.85% pa pre-retirement.

Question 7
Do you agree that taking a margin of 0.35% pa above the nominal gilt yield is appropriate to determine the typical funding post-retirement discount rate? If not, what alternative method and / or margin would you suggest (please provide a rationale and evidence)?

Question 8
Do you agree that taking a margin of 1.85% pa above the nominal gilt yield is appropriate to determine the typical funding pre-retirement discount rate? If not, what alternative method and / or margin would you suggest (please provide a rationale and evidence)?

Net post-retirement discount rate

3.13 The net post-retirement discount rate represents the return on appropriate investments after state pension age in excess of the annual increases on state benefits forgone.

3.14 After allowing for the assumed asset allocation set out in 3.5 and deducting investment expenses, the assumed 'best estimate' gross return is 4.73% pa to 4.88% pa, calculated:

$$(30\% \times 3.50\% + 30\% \times 5.00\% + 40\% \times 5.75\%) - 0.12\% = 4.73\%$$
to
$$(30\% \times 4.00\% + 30\% \times 5.00\% + 40\% \times 5.75\%) - 0.12\% = 4.88\%$$

3.15 Allowing for the 'best estimate' CPI increase of 2.00% pa to 2.50% pa gives a net return of 2.68% pa to 2.32% pa, calculated:

$$(1+ 4.73\%) / (1+2.00\%) - 1 = 2.68\%$$
to
$$(1+ 4.88\%) / (1+2.50\%) - 1 = 2.32\%$$

3.16 For the 'typical funding' basis, allowing for a margin of 0.35% above gilt return, as set out in 3.12, results in a nominal post-retirement return equal to 5.35% pa.

3.17 Allowing for the 'typical funding' CPI assumption of 3.20% pa, gives a net post-retirement discount rate of 2.08% pa.

3.18 Investment expenses are implicit in the above 'typical funding' nominal rate.

3.19 For the 'gilts' basis, the return on appropriate investments after state pension age is determined by reference to the gilt yields, after allowing for investment expenses of 0.1% pa. This results in a nominal return equal to 4.90% pa.

3.20 Allowing for the 'gilts' basis CPI assumption of 3.5% pa (based on gilts break-even inflation) gives a proposed net post-retirement discount rate of 1.35% pa.

Question 9
Do you agree that the 'gilts' basis post-retirement discount rate should be determined with reference to the assumed fixed interest gilt return?

Net pre-retirement discount rate

3.21 The net pre-retirement discount rate represents the return on appropriate investments before state pension age in excess of the revaluation of earnings factors on benefits forgone (by reference to NAE).

3.22 The 'best estimate' rates are expressed as a single rate which applies for the whole period to state pension age. However, they are calculated based on an asset allocation which varies by term to state pension age.

3.23 Based on the assumed asset allocation set out in 3.5 and deducting investment expenses, the assumed gross 'best estimate' returns are:

Just before SPA

[30% x 3.50% + 30% x 5.00% + 40% x 5.75%] – 0.12% = 4.73%

to

[30% x 4.00% + 30% x 5.00% + 40% x 5.75%] – 0.12% = 4.88%

10 years before SPA

[50% x 7.40% + 30% x 4.25% + 20% x 5.75%] – 0.14% = 5.99%

to

[50% x 7.90% + 30% x 4.50% + 20% x 5.75%] – 0.14% = 6.31%

Over 25 years to SPA

[80% x 7.40% + 12% x 4.25% + 8% x 5.75%] – 0.15% = 6.74%

to

[80% x 7.90% + 12% x 4.50% + 8% x 5.75%] – 0.15% = 7.17%

3.24 Allowing for the 'best estimate' NAE assumption of 4.25% pa to 4.75% pa gives net 'best estimate' assumptions of 0.46% pa to 0.12% pa for those currently just before state pension age, increasing to 1.66% pa to 1.49% pa for those currently 10 years to state pension age further increasing to 2.39% pa to 2.31% pa over the term to state pension age for those currently 25 or more years from state pension age.

Question 10
Do you agree with our term-dependent approach to setting the pre-retirement discount rate? If not, what would you suggest (please provide a rationale and evidence)?

3.25 For the 'typical funding' basis, allowing for a margin of 1.85% above gilts, as set out in 3.12, results in a nominal pre-retirement return equal to 6.85% pa.

3.26 Allowing for NAE increases of 5.45% pa results in a proposed net 'typical funding' pre-retirement discount rate of 1.33% pa.

3.27 For the 'gilts' basis, the return on appropriate investments before state pension age is 5.0% pa (the assumed fixed interest gilt yield). Deducting investment expenses of 0.1% pa, and allowing for NAE increases of 5.75% pa, results in a proposed net 'gilts' basis pre-retirement discount rate of -0.8% pa.

Question 11
Are you content with the way that the 'gilts' basis pre-retirement discount rate is determined with reference to the fixed interest gilt yield?

4 Demographic assumptions

4.1 Five specific sets of demographic assumptions are potentially needed in order to calculate the rebate:

- mortality for members of contracted-out pension arrangements, both before and after state pension age (although longevity after state pension age is much more significant than mortality before SPA),
- mortality for surviving spouses of members of contracted-out pension arrangements,
- proportions of members of contracted-out pension arrangements who are either married or have a civil partner at death,
- probability of 'remarriage' for surviving spouses (since inherited benefits cease on remarriage), and
- age differences between members of contracted-out pension arrangements and their partners.

4.2 State pension arrangements (as they affect future accrual) make little distinction between the benefits payable to widows, widowers and surviving civil partners. 'Spouse', 'marriage' and 'remarriage' should be construed accordingly in the following discussion.

4.3 We suggest that 'best estimate' assumptions for proportions married and spouses' age differences can also be used in the 'typical funding' basis and 'gilts' basis without causing difficulties of validity or interpretation. These are not particularly sensitive assumptions and adequate margins of prudence may be reflected in the mortality and financial assumptions.

4.4 We consider it appropriate that the mortality assumptions should distinguish between a 'best estimate' basis and 'typical funding' basis.

Mortality

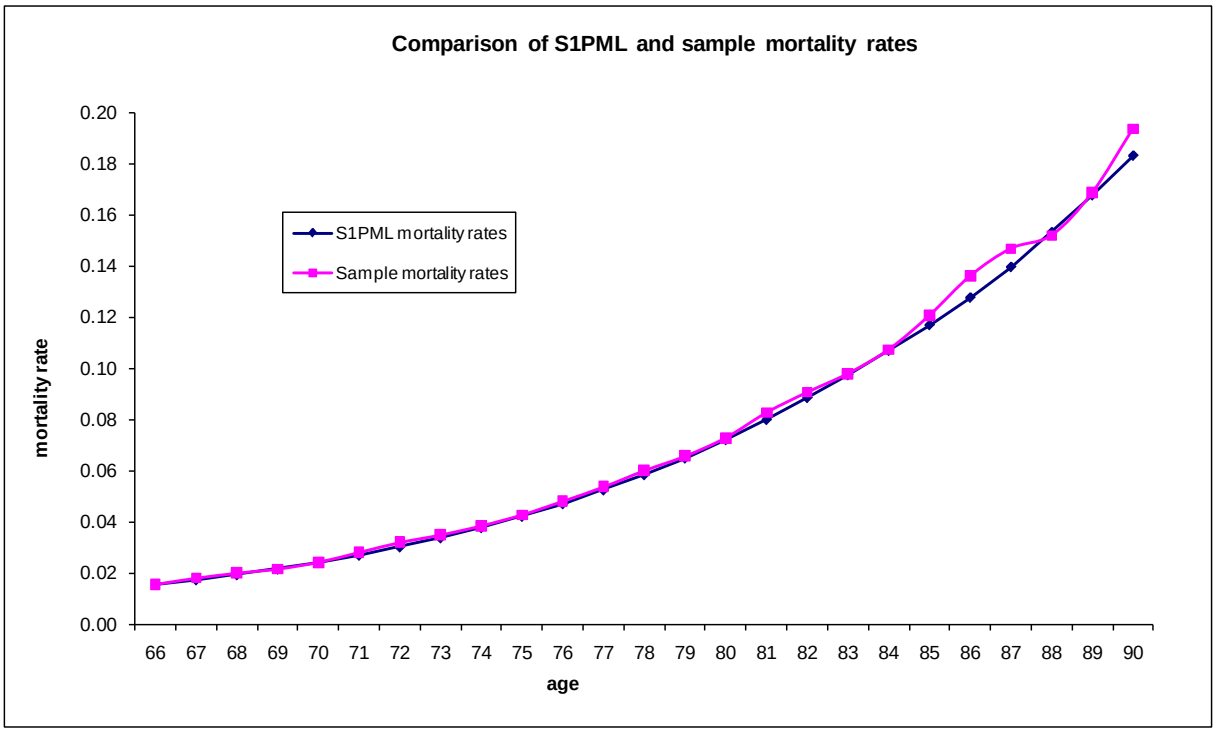
4.5 We have developed 'best estimate' mortality assumptions based on the experience of the contracted-out workforce. These are:

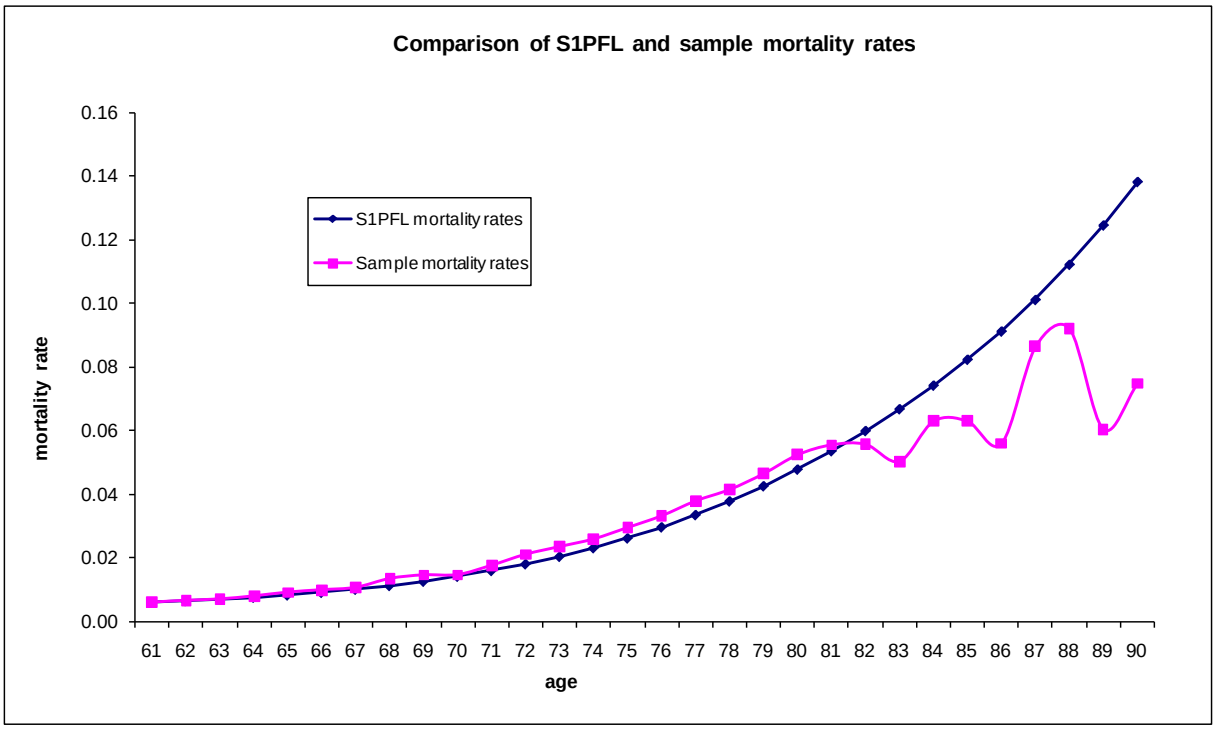
	Base table[2]
Male mortality	S1PML
Female mortality	S1PFL
Mortality of spouses of men	S1DFL
Mortality of spouses of women	S1PML

Note that there is no table S1DML produced for widowers.

[2] The base tables are available on the Institute and Faculty of Actuaries' website: http://www.actuaries.org.uk/research-and-resources/pages/s1-series-tables

4.6 In order to determine the 'best estimate' assumptions, we compared mortality rates derived from experience data representing a 1% sample of the National Insurance Fund over the period 2000/01 to 2007/08 to standard mortality tables. The graphs below show that the data were a good fit to the tables listed above. The experience of women over 80 is erratic and based on limited data.





4.7 Since the previous review, these SAPS tables have become established in general use. These tables are based on the experience of defined benefit pension schemes, so it is perhaps unsurprising that they show a good fit with the National Insurance Fund contracted-out experience.

4.8 The state second pension forgone is accrued up to the Upper Accrual Point only. Any amounts effect (the higher longevity exhibited by those receiving higher incomes) for contracted-out workers is limited by this cap on band earnings.

4.9 Given the limited data available on civil partners, we intend to apply the same spouse's mortality assumptions to bereaved civil partners. As such, the mortality tables for spouses set out above are being applied to a population which includes a small proportion of surviving civil partners, as well as widows or widowers.

Question 12
Do you agree that it is appropriate for the mortality assumptions to be framed in terms of the suggested SAPS lives tables? If not, please suggest an alternative with a rationale and evidence.

4.10 We propose to allow for future improvements in line with the 2008-based UK principal population projections as produced by the Office for National Statistics demography unit. While the Office for National Statistics does not express an opinion on the likelihood that this projection will be borne out in practice, GAD believes that it can reasonably be adopted as a best-estimate assumption.

Question 13
Do you feel that mortality improvements in line with the 2008-based UK principal population projections are suitable? If not, please suggest an alternative with a rationale and evidence.

4.11 In relation to scheme funding, the Pensions Regulator's guidance highlights the importance of a prudent approach to setting mortality assumptions for both the base table and future improvements.

4.12 The Pensions Regulator's report, 'Scheme Funding: an analysis of recovery plans' dated November 2009, indicates that over the three years covered by the report, scheme funding valuations showed a significant shift towards the use of 00 series tables, with a notable number of schemes using the S1 series tables for 2007/2008 valuations.

4.13 The report also showed that half of the 2007/2008 valuations applied either an age rating or percentage adjustment to the base tables.

4.14 A year of use approach to projecting future improvements was used almost exclusively for 2007/2008 valuations.

4.15 Over the three year period covered by the report, there was a shift towards applying the long cohort adjustment (32% in 2007/08). For 2007/2008 62% of valuations also applied an underpin to their mortality improvement rates.

4.16 We suggest that a 'typical funding' basis might incorporate a two year age deduction from the base mortality tables, to provide a margin of prudence.

Question 14
For the 'typical funding' mortality assumption, the margin of prudence is a somewhat arbitrary assumption and we welcome comments on actual practice and our proposed two year offset.

4.17 We also propose to adopt a two year offset for the 'gilts' basis.

Question 15
Do you feel that the information provided to the Secretary of State by the 'gilts' basis could be improved if different mortality assumptions (to the 'typical funding' basis) were used? If so, please suggest alternative assumptions with a rationale and evidence.

4.18 These various possible mortality tables are compared using life expectancies in Appendix E.

Proportions married (including civil partnership)

4.19 We suggest that the proportions married assumptions should be based on the 2006-based projections as prepared by the Office for National Statistics for England and Wales. We consider these projections to be 'best estimate'.

4.20 Sample proportions married at death for 2014 are given in the following table:

Age	Men	Women
60	70%	67%
65	73%	67%
70	75%	62%
75	73%	52%
80	68%	39%

Question 16
Do you consider our proportions married assumptions appropriate for all three bases?

Probability of remarriage

4.21 At previous reviews, assumptions were made in regard to the remarriage of surviving spouses (including civil partners). If the same assumption were applied at this review, it would reduce the value of the benefits by less than 1%, which we consider is not material in this context. We therefore propose to omit this assumption.

Question 17
Do you agree with our proposal to omit any remarriage assumption?

Age differences

4.22 We suggest that spousal age differences should be assumed to be broadly in line with the experience of the population of Great Britain as revealed by the 2001 census, which is the latest available.

4.23 Sample age differences are set out in the following table:

Age	Men	Women
60	spouse 3 years younger	spouse 2 years older
65	spouse 3 years younger	spouse 2 years older
70	spouse 4 years younger	spouse 2 years older
75	spouse 4 years younger	spouse 1 year older
80	spouse 4 years younger	spouse same age

4.24 The census data concerns opposite sex relationships only, given its date. Of course, civil partners are on average the same age as each other (though the elder is more likely to die first on average).

4.25 We suggest that the use of average spousal age differences based on the 2001 census remains satisfactory, with the passage of time and inclusion of a small proportion of civil partners and workers in Northern Ireland not causing a material issue.

Question 18
Are you content for the proposed age difference assumptions to be adopted for all three bases? If not, please suggest alternatives with a rationale and evidence.

5 Other assumptions

Expenses – administrative

5.1 For defined benefit schemes, we are concerned with the marginal cost of contracting-out. The National Insurance rebate should allow for any specific expenses involved. It would not be unreasonable to assume that these expenses are close to nil for a defined benefit scheme. Alternatively, it could be argued that there are some minor expenses incurred solely as a result of contracting-out which should be loaded onto the rebate.

5.2 At the last review, an expense allowance of 0.2% of band earnings was made. We have retained this assumption.

Question 19
Do you agree that a 0.2% addition to the rebate is an appropriate allowance for administrative expenses? If not, please suggest an alternative with evidence.

Weights

5.3 The reduction in the National Insurance contributions for members of contracted-out defined benefit schemes will continue to be a single percentage of band earnings, independent of sex and age. It is necessary, therefore, to weight the derived individual age and sex related rebates to obtain an appropriate average rebate.

5.4 These weightings are based on sample data from the National Insurance Fund. The trends in data are projected over the period the new rebate will apply.

5.5 The following table shows the derived weights and those adopted at the previous review:

	Men		Women	
Age Group	**2007-12**	**2012-17**	**2007-12**	**2012-17**
20-24	1.89%	0.83%	1.13%	1.09%
25-29	4.87%	3.49%	4.41%	5.03%
30-34	4.52%	4.88%	5.02%	5.88%
35-39	7.29%	5.60%	7.72%	6.04%
40-44	7.93%	7.05%	9.90%	7.71%
45-49	7.88%	8.57%	10.71%	9.89%
50-54	5.64%	8.32%	8.81%	9.37%
55-59	3.55%	5.95%	6.60%	6.09%
60-64	1.70%	2.59%	0.43%	1.62%
Total	**45.27%**	**47.28%**	**54.73%**	**52.72%**

Question 20
Do you have any comments about the approach to deriving the weights or the weights themselves?

6 Summary of proposed approaches and derived rebates

6.1 This section summarises the proposed assumptions for each approach together with the rebate that would result if the assumptions were adopted.

6.2 The assumptions used to calculate the recommended defined benefit rebate at the previous review are set out in Appendix F.

Best estimate

6.3 Using the assumptions summarised below, we derive a rebate on the 'best estimate' basis of 4.7% to 4.9%.

Financial	
Pre-retirement discount rate (net of earnings growth)	0.46% pa to 0.12% pa just before SPA 1.66% pa to 1.49% pa 10 years to SPA 2.39% pa to 2.31% pa >25 yrs to SPA
Post-retirement discount rate (net of pension increases)	2.68% pa to 2.32% pa
Gross pre-retirement discount rate	4.88% pa to 4.73% pa

Demographic	
Mortality	Based on the standard S1 tables, allowing for mortality improvements in line with the 2008-based ONS principal projections of population mortality improvements
Proportions 'married'	In line with the 2006-based national projections
Rates of remarriage	None
Marital age differences	In line with the 2001 national census data

Other	
Weights	Derived by GAD from National Insurance sample data
Administrative expenses	0.2% pa of band earnings
Investment expenses	The discount rates above are net of investment expenses of between 0.12% pa and 0.15% pa

Question 21
When viewed as a whole do you feel that the 'best estimate' basis is in line with the definition set out in section 2.10? If not, please explain, and provide an alternative with evidence and rationale.

Typical funding

6.4 Using the assumptions summarised below, we derive a rebate on the 'typical funding' basis of 6.0%.

Financial	
Pre-retirement discount rate (net of earnings growth)	1.33% pa
Post-retirement discount rate (net of pension increases)	2.08% pa
Gross pre-retirement discount rate	5.35% pa

Demographic	
Mortality	Based on the standard S1 tables, allowing for mortality improvements in line with the 2008-based ONS principal projections of population mortality improvements. Rates are offset by two years of age.
Proportions 'married'	In line with the 2006-based national projections
Rates of remarriage	None
Marital age differences	In line with the 2001 national census data

Other	
Weights	Derived by GAD from National Insurance sample data
Administrative expenses	0.2% pa of band earnings
Investment expenses	The discount rates above are based on GAD's analysis of typical discount rates used in practice, net of investment expenses.

Question 22
When viewed as a whole do you feel that the 'typical funding' basis is in line with the definition set out in section 2.10? If not, please explain, and provide an alternative with evidence and a rationale.

Gilts

6.5 Using the assumptions summarised below, we derive a rebate on the 'gilts' basis of 10.1%. This is substantially higher than the other two bases because of the low yields available on gilts relative to assumed returns on other asset classes.

Financial	
Pre-retirement discount rate (net of earnings growth)	-0.8% pa
Post-retirement discount rate (net of pension increases)	1.35% pa
Gross pre-retirement discount rate	4.90% pa

Demographic	
Mortality	Based on the standard S1 tables, allowing for mortality improvements in line with the 2008-based ONS principal projections of population mortality improvements. Rates are offset by two years of age.
Proportions 'married'	In line with the 2006-based national projections
Rates of remarriage	None
Marital age differences	In line with the 2001 national census data

Other	
Weights	Derived by GAD from National Insurance sample data
Administrative expenses	0.2% pa of band earnings
Investment expenses	The discount rates above are net of investment expenses of 0.10 % pa.

Question 23
When viewed as a whole do you feel that the 'gilts' basis is in line with the definition set out in section 2.10? If not, please explain, and provide an alternative with evidence and a rationale.

7 Defined contribution schemes

7.1 Section 15(1) of the Pensions Act 2007 provides that contracting-out on a defined contribution basis (via Contracted-out Money Purchase Schemes (COMPS) and Appropriate Personal Pensions (APPs)) will be abolished from a date appointed by the Secretary of State. The abolition date has not yet been set in legislation, though it is intended to be 6 April 2012.

7.2 Legal advice is that even if an order is laid confirming the abolition date, the Government Actuary's statutory obligation to provide a report recommending rebate percentages would still be in force. The obligation will remain until the primary legislation (Pension Schemes Act 1993 sections 42B and 45A) is repealed, which will not happen before the report for the current review is due.

7.3 Therefore, the Government Actuary must produce a report recommending the percentage rebates for COMPS and APPs, even though these rebates are not expected to come into force.

7.4 We intend to take a pragmatic approach and choose assumptions following the consultation that are reasonable in the circumstances and which are informed by the responses received in respect of defined benefit schemes. We will then produce the derived rebate percentages as efficiently as possible and report accordingly. We intend to provide defined contribution rebate rates on one set of assumptions only.

7.5 As the defined contribution rebate rates are not expected to come into force we are not consulting fully on the assumptions that should underlie them. However, should you wish to make any comments then please do.

7.6 The assumptions underlying the rebate rate calculations for COMPS and APPs at the previous review are set out in Appendix G.

7.7 If for any reason the decision to abolish defined contribution contracting-out were reversed, we have strongly recommended that the Department for Work and Pensions take further advice from us before implementing any new rebate percentages.

Question 24
Do you have any comments on our proposed approach to defined contribution schemes?

Appendix A - List of consultation questions

Question 1
Do you agree that we have correctly identified the main relevant changes in the factors affecting the cost of providing benefits of an actuarial value equivalent to the benefits forgone by staff who are contracted-out on a defined benefit basis? What other factors do you consider relevant?

Question 2
Do you agree that we are planning to advise on a sufficient range of bases? Please suggest, with reasons, any additional basis that you think we should include. In particular, do you consider that extra information would be provided by inclusion of an 'accounting' basis?

Question 3
Our proposed financial assumptions are influenced by market conditions as at end March 2010. Given that the rebates calculated will be applied in the future, do you consider it appropriate for us to update the financial assumptions when we finalise our report?

Question 4
Do you agree with the asset allocation underpinning our calculation of the 'best estimate' discount rates? If not, what alternative asset allocations would you suggest (please provide a rationale and evidence)?

Question 5
Within the range 2.0% pa to 2.5% pa, what do you consider an appropriate 'best estimate' assumption for CPI. Please provide a rationale and evidence to support your view.

Question 6
Do you agree with our estimates of the building blocks for deriving the financial assumptions? If not, please provide alternative assumptions and evidence or a rationale to support these.

Question 7
Do you agree that taking a margin of 0.35% pa above the nominal gilt yield is appropriate to determine the 'typical funding' post-retirement discount rate? If not, what alternative method and / or margin would you suggest (please provide a rationale and evidence)?

Question 8
Do you agree that taking a margin of 1.85% pa above the nominal gilt yield is appropriate to determine the 'typical funding' pre-retirement discount rate? If not, what alternative method and / or margin would you suggest (please provide a rationale and evidence)?

Question 9
Do you agree that the 'gilts' basis post-retirement discount rate should be determined with reference to the assumed fixed interest gilt return?

Question 10
Do you agree with our term-dependent approach to setting the pre-retirement discount rate? If not, what would you suggest (please provide a rationale and evidence)?

Question 11
Are you content with the way that the 'gilts' basis pre-retirement discount rate is determined with reference to the fixed interest gilt yield?

Question 12
Do you agree that it is appropriate for the mortality assumptions to be framed in terms of the suggested SAPS lives tables? If not, please suggest an alternative with a rationale and evidence.

Question 13
Do you feel that mortality improvements in line with the 2008-based UK principal population projections are suitable? If not, please suggest an alternative with a rationale and evidence.

Question 14
For the 'typical funding' mortality assumption, the margin of prudence is a somewhat arbitrary assumption and we welcome comments on actual practice and our proposed two year offset.

Question 15
Do you feel that the information provided to the Secretary of State by the 'gilts' basis could be improved if different mortality assumptions (to the 'typical funding' basis) were used? If so, please suggest alternative assumptions with a rationale and evidence.

Question 16
Do you consider our proportions married assumptions appropriate for all three bases?

Question 17
Do you agree with or proposal to omit any remarriage assumption?

Question 18
Are you content for the proposed age difference assumptions to be adopted for all three bases? If not, please suggest alternatives with a rationale and evidence.

Question 19
Do you agree that a 0.2% addition to the rebate is an appropriate allowance for administrative expenses? If not, please suggest an alternative with evidence.

Question 20
Do you have any comments about the approach to deriving the weights or the weights themselves?

Question 21
When viewed as a whole do you feel that the 'best estimate' basis is in line with the definition set out in section 2.10? If not, please explain, and provide an alternative with evidence and rationale

Question 22
When viewed as a whole do you feel that the 'typical funding' basis is in line with the definition set out in section 2.10? If not, please explain, and provide an alternative with evidence and rationale.

Question 23
When viewed as a whole do you feel that the 'gilts' basis is in line with the definition set out in section 2.10? If not, please explain, and provide an alternative with evidence and a rationale.

Question 24
Do you have any comments on our proposed approach to defined contribution schemes?

Question 25
Do you have any other comments on this review of the contracted-out rebates for 2012 to 2017?

If you would like the information that you provide to be treated as confidential, please be aware that, under the Freedom of Information Act 2000, there is a statutory Code of Practice with which public authorities must comply and which deals with, among other things, obligations of confidence. In view of this it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding.

Appendix B - The Government's consultation criteria

Criterion one – When to consult
Formal consultation should take place at a stage when there is scope to influence the policy outcome.

Criterion two – Duration of consultation exercises
Consultations should normally last for at least 12 weeks with consideration given to longer timescales where feasible and sensible.

Criterion three – Clarity and scope of impact
Consultation documents should be clear about the consultation process, what is being proposed, the scope to influence and expected costs and benefits of the proposals.

Criterion four – Accessibility of consultation exercises
Consultation exercises should be designed to be accessible to, and clearly targeted at, those people the exercise is intended to reach.

Criterion five – The burden of consultation
Keeping the burden of consultation to a minimum is essential if consultations are to be effective and if consultees' buy-in to the process is to be obtained.

Criterion six – Responsive of consultation exercises
Consultation responses should be analysed carefully and clear feedback should be provided to participants following consultation.

Criterion seven – Capacity to consult
Officials running consultations should seek guidance in how to run an effective consultation exercise and share what they have learned from the experience.

HM Government Code of Practice on Consultation can be downloaded from
http://www.berr.gov.uk/files/file47158.pdf

Appendix C - Legal background

State second pension and contracting-out

C.1 The state second pension is set out in the Social Security Contributions and Benefits Act 1992 (SSCBA 1992). The Category A pension (paid to the contributor) is described from s44. The Category B pension (inherited by the spouse of the contributor) is described from s48A. The amounts of the state second pension (and the effect of contracting-out) are set out in Schedule 4A in respect of accrual after 2002/03 and before the 'flat rate introduction year'. Accrual from the 'flat rate introduction year' is set out in Schedule 4B. The 'flat rate introduction year' has not been prescribed yet, but it is intended that it will be 2012/13.

C.2 The amount of the state second pension forgone by members of contracted-out defined benefit schemes is defined identically in both Schedule 4A and 4B, so no difficulty arises in this regard from the uncertainty around the definition of the 'flat rate introduction year'.

C.3 For defined contribution schemes, only Schedule 4A provides definitions of contracted-out benefits, since the 'flat rate introduction year' is expected to be synchronised with the abolition of defined contribution contracting-out.

National Insurance rebates

C.4 The Pension Schemes Act 1993 (PSA 1993), sections 40 to 49 inclusive, makes provision for members of pension schemes who are contracted-out of the state second pension (and the sponsoring employers of those schemes) to pay reduced rates of National Insurance contributions and/or to have their pension schemes receive corresponding payments from HM Revenue & Customs (HMRC).

C.5 PSA 1993 s42 requires a review to be carried out by the Government Actuary, at intervals of not more than five years, of the National Insurance rebates for members of defined benefit schemes (Contracted-Out Salary-Related Schemes or COSRS). The review should report on any changes in the factors affecting the cost of providing benefits of an actuarial value equivalent to that of the state pension benefits which are given up by or in respect of members of these schemes. The legislation does not require the Government Actuary to recommend percentage rebates, though in practice the Department for Work and Pensions (DWP) commission GAD to provide advice on the level of rebate values (and there is no legislative bar preventing this).

C.6 Separate requirements exist for members of Contracted-Out Money Purchase Schemes (COMPS) under PSA 1993 s42B. COMPS are occupational defined contribution schemes. Rebates are age-related for members of COMPS. The Government Actuary must report on the percentage age-related rebates required to reflect the cost of providing benefits of an actuarial value equivalent to that of the state pension benefits which are given up by or in respect of members of COMPS.

C.7 PSA 1993 s45A specifies age related rebates for Appropriate Personal Pensions (APPs). These rebates are paid by HMRC direct to the schemes. The Government Actuary must report on the age-related rebates required to reflect the cost of providing benefits of an actuarial value equivalent to that of the state pension benefits which are given up by or in respect of members of APPs.

C.8 The same sections of PSA 1993 require any order by the Secretary of State for Work and Pensions to vary the rate of reduction in National Insurance contributions or rebates, to which the Government Actuary's reports would relate, to be made at least one complete tax year before they come into force and within 5 years of the previous order. Hence for new rebates to apply from 6 April 2012, the relevant orders and the Government Actuary's reports must be laid before Parliament by 1 March 2011, since the previous order was laid on 1 March 2006.

Changes since the previous review

C.9 For people in contracted-out employment, section 10(3)(b) of the Pensions Act 2007 (PA 2007) provides that the state second pension will move to accrual on two bands (previously there were three bands) from 2010/11.

C.10 Section 15(1) of PA 2007 provides that contracting-out on a defined contribution basis (via COMPS and APPs) will be abolished from a date appointed by the Secretary of State. The abolition date has not yet been set, but is expected to be April 2012, at the same time as the Band 1 accrual of the state second pension moves to a flat rate.

C.11 Section 13 of PA 2007 provides that state pension age will rise from 65 to 68 over the period 2024 to 2046.

C.12 At the June 2010 budget, the Chancellor announced that state second pension will be increased in payment in line with the Consumer Prices Index rather than the Retail Prices Index.

Reduced state pension

C.13 The effect of contracting-out on a member's state second pension is set out in the Social Security Contributions and Benefits Act 1992 (SSCBA 1992) Schedules 4A and 4B.

C.14 For defined benefit schemes, members give up a percentage of their earnings between the Qualifying Earnings Factor (that is, the Lower Earnings Limit expressed as an annual amount) and the Upper Accrual Point (expressed as an annual amount).

C.15 The percentage is 20 divided by the number of 'relevant years' in the member's 'working life'. 'Working life' (defined in SSCBA 1992 schedule 3 paragraph 5(8)) is the period between the tax year the member attains the age of 16, and the tax year immediately before attaining state pension age. 'Relevant years' (defined in SSCBA 1992 s44(7)) are restricted to 1978/79 and later.

C.16 The benefits forgone would otherwise have been payable at state pension age.

C.17 From the 'flat rate introduction year' the state second pension itself is amended. For a few members (older and higher earning) the state second pension is reduced to below the level of the contracted-out deduction. Therefore, in these cases the contracted-out deduction is restricted.

Inherited benefits (simplified summary)

C.18 Where both the contributor and the spouse (including civil partners) are over state pension age at the date of the contributor's death then the spouse generally becomes entitled to a pension equal to half of the contributor's accrued state second pension (though in some cases inheritance is capped at a maximum value).

C.19 If the spouse is under state pension age then the inherited pension is not paid until state pension age unless there are dependent children. If the spouse is between 45 and 55 and there are no dependent children then the inherited pension is reduced, as well as being delayed until state pension age. If the spouse is under 45 and there are no dependent children then the inherited pension is eliminated.

Reduced National Insurance Contributions

C.20 The Pension Schemes Act 1993 s41(1), (1A) and (1B) provide that the Class 1 National Insurance contributions payable in respect of the member of a contracted-out defined benefit scheme should be reduced by a percentage of their earnings between the Lower Earnings Limit and the Upper Accrual Point.

Defined contribution schemes

C.21 For the time being, contracted-out occupational money purchase schemes have the same State Pension reduction as defined benefit schemes. Members of appropriate personal pension schemes generally forgo their entire entitlement to state second pension.

C.22 The National Insurance rebates for defined contribution schemes are age related, and may differ between COMPS and APPs.

Appendix D - Evidence to support the financial assumptions

'Typical funding' basis considerations

D.1 The Pension Regulator's report 'Scheme funding: an analysis of recovery plans', dated November 2009, provides an overview of the first triennial cycle of the new scheme funding regime for defined benefit and hybrid pension schemes. The triennial cycle is analysed in 3 tranches over the period from September 2005 to September 2008.

D.2 The report states:

"The discount rate can be broadly described by the following equation:

discount rate = risk free rate + risk premium

A proxy such as a government bond yield is typically used for the risk free rate, and a spread (i.e. a risk premium) over the risk free rate is assumed, typically based on:

- *The time horizon of the liabilities*
- *The potential for additional investment return; and*
- *A prudence adjustment, based on the employer's covenant"*

D.3 The table below sets out the spread over the gilt yield of the weighted average discount rate data for those schemes that adopt different discount rates pre and post retirement.

	Tranche 1	**Tranche 2**	**Tranche 3**
Excess of pre retirement discount rate over gilt yield[3]	2.0% pa	1.6% pa	1.9% pa
Excess of post retirement discount rate over gilt yield[3]	0.3% pa	0.2% pa	0.6% pa

Source: tPR and GAD

D.4 The report notes that:

"there has been an increase in the discount rate spread over UK gilt yields. This trend may be because schemes are adopting an increased risk premium when setting discount rates. This increase…in tranche 3 implies all else being equal, a slightly greater reliance on investment outperformance to meet scheme liabilities."

Furthermore, the report refers to this 'investment outperformance' as corresponding to the increase in corporate bond spread over gilts and states that:

"anecdotal evidence from case work by the regulator suggests that some schemes are using corporate bond yields at least in part as a basis for setting the discount rate".

[3] Where 'pre and post retirement discount rates' are before deduction of an inflation assumption, and gilt yield is measured as the yield on the over 15 year UK gilt index

D.5 Anecdotally, we understand that schemes historically have typically deducted 0.25% pa from the break-even inflation rate to allow for an inflation risk premium. Although we do not have evidence, we believe that in the current environment the inflation risk premia assumed in typical funding bases will have risen.

Pension scheme asset allocation

D.6 The NAPF 2009 Annual Survey provides statistics on defined benefit pension schemes with assets to the value of approximately £400 billion. Notably, page 29 sets out the asset allocation of the defined benefit schemes covered by the survey. Approximately 34% of assets are shown as government and corporate bonds, of which around 15% are shown as the latter. This suggests that around 44% of the 'bond' assets held by the pension schemes covered by the survey were corporate bonds.

D.7 In respect of the split of assets between the UK and Overseas, the NAPF 2009 survey shows that the split of equities held was approximately 50:50. The vast majority of government bonds held were UK gilts.

D.8 The 2009 Purple Book published by the Pensions Regulator covers almost all pension schemes in the PPF eligible UK defined benefit scheme universe. Section 7.6 shows that:

- broadly speaking, for those schemes with around 90% non pensioner and 10% pensioner liabilities, their asset allocation is in the region of: 60% equities and property, 30% gilts and fixed interest and 10% other.
- broadly speaking, for those schemes with around 50% non pensioner and 50% pensioner members, their asset allocation is circa: 45% equities, 5% property, 38% gilts and fixed interest and 12% other.

Section 7.3 shows that the weighted average allocation of 'bond' assets to government bonds was 29%, to index-linked bonds was 32.6% and to corporate bonds was 38.3%.

Consumer Prices Index (CPI) and Retail Prices Index (RPI)

D.9 The CPI and RPI measures of inflation differ in both their construction methods and in the items which are included. The formula for CPI uses a geometric mean to combine prices within each category. This gives a lower mean than the arithmetic method that is used for RPI. The Office for National Statistics (2003)[4] calculated that this formula effect meant that RPIX was about 0.5% greater than CPI for historic data, with an additional difference of 0.2% pa due to differences in items included.

[4] Office for National Statistics (2003) "The New Inflation Target: the Statistical Perspective"

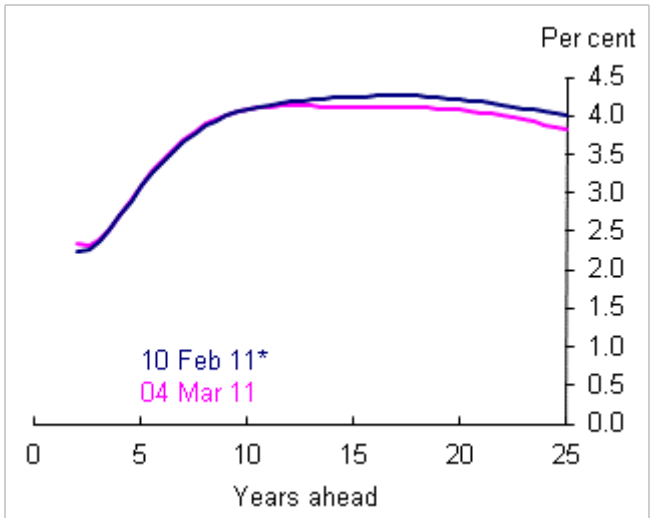
D.10 Since 1992, when inflation targeting began, RPI has been 0.7% pa greater than CPI[5]. HM Treasury have often used a difference of 0.75% pa for their budget projections, for example HM Treasury (2007)[6], and this is also consistent with the views of King (2007)[7] who said the Bank of England expected an average long run gap of about 0.7% / 0.8% pa.

D.11 The Office for Budget Responsibility's expectations of the gap between CPI and RPI in the short-term are much higher at 1.0% -1.5%. This is likely to be due to expectations that rises in interest rates will push up RPI relative to CPI (as unlike CPI, RPI includes mortgage interest payments).

D.12 Over the period 1900 to 2000 Dimson, Marsh and Staunton (2002)[8] found that the geometric average inflation has been 4.1% pa in the UK and 3.2% pa in the US. However, the average inflation rate is very dependent on the period chosen. Since October 1992, when the UK adopted an inflation targeting regime, inflation has been lower. Between October 1992 and March 2010 the geometric average of RPI inflation has been 2.7% pa[9].

D.13 An alternative method of estimating future inflation is to look at the inflation required so that the return on index linked bonds is the same as that on nominal bonds.

UK instantaneous implied inflation forward curve



Source: Bank of England

[5] The difference in geometric means between October 1992 and March 2010 using Office for National Statistics data
[6] HM Treasury (2007) "Budget 2007"
[7] King, Mervyn (2007) "Inflation report press conference – 16 May 2007"
[8] Dimson, Marsh and Stauton (2002) "Triumph of optimists, 101 years of global investment returns"
[9] Calculated using data from the Office for National Statistics

D.14 However such breakeven rates may also contain risk premia and these must be removed to calculate the expected inflation. Generally, it is considered that the risk premium for nominal bonds is positive which is consistent with investors demanding an additional expected return to compensate them for the risk that their real return is eroded by periods of high inflation. The inflation risk premium is difficult to estimate and may vary by term and through time. A good summary of studies investigating the size of the inflation risk premium can be found in Hördahl (2008)[10], which has been quoted below.

"The available empirical evidence on the properties of inflation risk premia is somewhat mixed. Studies that cover very long sample periods and that do not include information from index-linked bonds to help pin down the dynamics of real yields often report sizeable inflation risk premia. For example, using a structural economic model, Buraschi and Jiltsov (2005) find that the 10-year US inflation risk premium averaged 70 basis points from 1960.[11] They also find that the inflation premium was highly time-varying, and that by the end of their sample it had fallen to relatively low levels. Ang et al (2008) estimate a term structure model in which inflation exhibits regime switching using US inflation and nominal yield data, and report a large and time-varying inflation risk premium (on average, around 115 basis points for the five-year maturity over their 1952–2004 sample).

In papers that focus on more recent periods and in those that utilise information embedded in index-linked bonds, inflation risk premium estimates tend to be relatively small, although still mostly positive. Durham (2006) estimates a no-arbitrage model using US Treasury inflation-indexed bond data and finds that the 10-year inflation premium hovered around a slightly positive mean from 2003 onwards.[12] D'Amico et al (2008) apply a similar model to data from 1990 onwards, and report a moderate-sized positive 10-year inflation premium (around 50 basis points on average) that is relatively stable. However, they also find that their results are sensitive to the choice of date from which index-linked bond data are included.

The available empirical evidence relating to euro area data is more limited. In fact, apart from the papers on which this article is based, there appears to be only one study focusing on the euro area.[13] García and Werner (2008) apply a term structure model similar to that used by D'Amico et al (2008) on euro real and nominal yields, supplemented with survey data on inflation expectations. Their estimates suggest that the inflation premium at the five-year horizon has averaged around 25 basis points since the introduction of the euro, and that it has fluctuated only mildly over time. Hence, their results seem to be in line with those of Durham

[10] Hördahl (2008)[10] "The inflation risk premium in the term structure of interest rates", BIS Quarterly Review September 2008

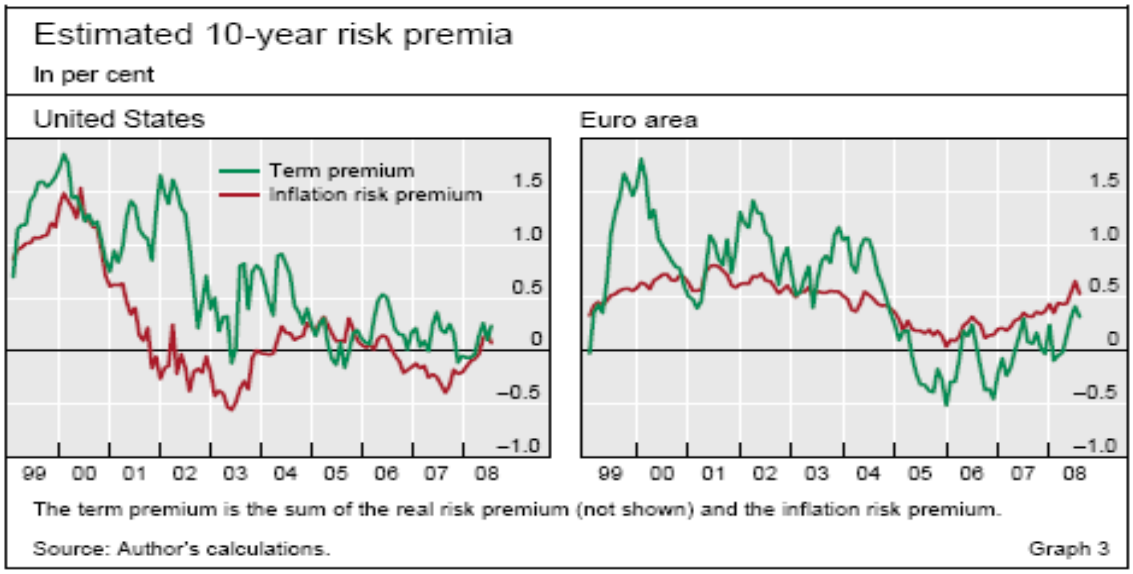
[11] All quantitative risk premium estimates mentioned are in terms of (annualised) yield, rather than for example holding period returns.

[12] Prior to 2003, Durham (2006) obtains a 10-year inflation premium that was mostly negative. This is probably due to sizeable liquidity premia in this part of the sample period, which would have tended to raise the index-linked bond yield and therefore produce negative inflation premia to fit the resulting low level of break-even inflation rates.

[13] Prior to 2003, Durham (2006) obtains a 10-year inflation premium that was mostly negative. This is probably due to sizeable liquidity premia in this part of the sample period, which would have tended to raise the index-linked bond yield and therefore produce negative inflation premia to fit the resulting low level of break-even inflation rates.

(2006) and D'Amico et al (2008), which point to a relatively modest, but positive, long-term inflation risk premium in recent years."

D.15 Hördahl (2008) estimates the inflation risk premium using a dynamic term structure model based on an explicit structural macroeconomic model. Using this model he estimated that in 2008 the inflation risk premium on 10-year bonds in the Euro area was about 0.5% pa but that it was lower in the US (about 0.1% pa), as illustrated by the graphs[14] below:



Source: Hördahl (2008)

D.16 There is reason to believe that the changed economic environment since this report was completed may have led to an increase in the inflation risk premium.

D.17 PricewaterhouseCoopers (2007)[15] reviewed investment return projection rates for the FSA, and suggested an appropriate assumption of 2.75% pa for RPI assuming that the inflation targeting regime by the Bank of England continued. In coming to this conclusion they considered both the breakeven inflation (which was then about 3.15% pa) as well as the Bank of England's target.

D.18 The forward breakeven inflation rate[16] between 5 and 40 years time is 4.25% pa.

D.19 At first sight it may appear that the perspective of investors which leads to such a breakeven inflation rate is incompatible with the perspective of economic forecasters who believe that the 2.0% pa Bank of England target for CPI provides an appropriate best estimate for future inflation. However, this is not necessarily the case as the following argument demonstrates.

[14] Hördahl (2008) "The inflation risk premium in the term structure of interest rates", BIS Quarterly Review September 2008
[15] PricewaterhouseCoopers (2007) "Review of FSA Projection Rates"
[16] Calculated using the Bank of England nominal gilt forward curves from 25 March 2010 and extrapolating beyond the 25 years that these are available for, by assuming that the forward rate is constant.

- Beyond the immediate term, the best estimate of CPI inflation in any one year is 2.0%, in line with the Bank of England target and independent forecasts.
- In practice there will inevitably be variation around the target level (that is, there is a distribution of possible outturns each year).
- The Monetary Policy Committee mandate implies that the outturn for CPI in any year is equally likely to be above or below 2.0%.
- However, the magnitude of possible deviations from the target level may be greater on the upside than the downside, as has been demonstrated by past 'inflation shocks'. Hence the distribution of annual inflation may be positively skewed and so may have an average greater than 2.0%. Whilst there is unlikely to be consensus on the shape of this forward-looking distribution, a reasonable assessment of the distribution might be in the range of 2.0% to 2.5%.
- Long-term investors are naturally concerned about the average outcome for inflation over the term of their investment and not just year by year. Hence they are interested in the multi-year distribution for inflation and not just the single-year distribution. This is complicated by the fact that there is likely to be some positive serial correlation in annual inflation figures as a future inflation shock may take more than one year to eliminate. Combined with any skew in the single-year distribution, this means that the median annualised inflation figure from the multi-year distribution may exceed the median inflation figure from the single-year distribution. For example we have analysed the impact of compounding one reasonable single-year distribution with a median of 2.0% and mean of 2.5% and found the resulting multi-year distribution over 10 or 20 years to have both a median and a mean of around 2.5%.
- Hence the 'best estimate' CPI assumption relevant to investors and consistent with the Bank of England target may be in the range 2.0% pa to 2.5% pa.
- Most estimates of the long-term 'wedge' between CPI and RPI are around 0.75% pa. Hence a consistent best estimate RPI assumption would be in the range 2.75% pa to 3.25% pa.
- Because of a considerable degree of uncertainty around future inflation and the desire for inflation protection from many long-term investors such as pension funds, it is reasonable in current circumstances for market pricing of gilts to reflect an 'inflation risk premium' of up to 1.5% pa.
- Hence gilt RPI-based 'breakeven inflation' of up to 4.25% pa could be considered consistent with economic forecasts in line with the Bank of England CPI target of 2.0% pa.

National Average Earnings (NAE)

D.20 There is evidence to suggest that earnings increase faster than prices over the long term. However, in the short term there can be large fluctuations which may be driven by business cycle fluctuations.

D.21 Since 1970 wages have increased by 1.7% pa more than prices[17]; however the rate of real earnings growth appears to have fallen in recent years and has averaged 1.1% pa since the introduction of inflation targeting in 1992.

D.22 PricewaterhouseCoopers (2007)[18] carried out statistical analysis and recommended a 1.5% pa real earnings growth was used for the projection of investment illustrations. However, they also noted a number of uncertainties surrounding this and estimated the plausible range of real earnings growth to be around 1.0% to 2.0% pa.

Gilt returns

D.23 The expected return on fixed interest gilts bought in 5 years' time will be equal to the yield on gilts at that point in time. The market consistent expectation of this is the forward rate on gilts in 5 years' time for the term of the gilt bought. Considering 35 year gilts, the forward nominal rate between 5 and 40 years' time on fixed interest gilts is about 5.0% pa[19].

D.24 Similarly, the expected return on index-linked gilts bought in 5 years time will be equal to the yield on gilts at that point in time. Again, the market consistent expectation of this is the forward rate on gilts in 5 years time for the term of the gilt bought. Considering 35 year gilts, the forward real rate between 5 and 40 years time on index linked gilts is about 0.75% pa[20].

Corporate bond returns

D.25 Corporate bonds are exposed to the risk of default and so the expected return is lower than their 'promised' gross redemption yield. Part of the spread between government and corporate bonds is due to the expected loss due to default, part reflects a risk premium for the uncertainty in return and the residual is a non-credit related premium (for example, to compensate for lower liquidity). Dimson, Marsh and Staunton (2002)[21] found that the geometric mean return of US high grade corporate bonds between 1900 and 2000 was 2.11% pa which was 0.48% pa higher than government bonds. They then went on to comment:

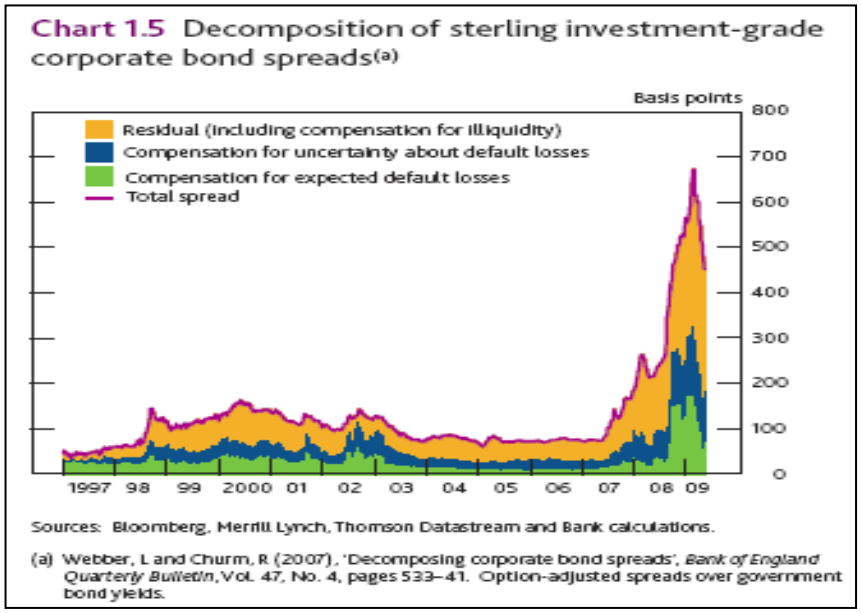
"High-grade corporates typically trade on redemption yields about one percentage point higher than on government bonds. This suggests that about half the 'promised' yield differential fails to materialize because of defaults, downgrades, and early calls, while around half represents the achieved risk premium."

[17] This is the difference in the geometric averages of RPI and the UK earnings index between January 1970 and February 2010.
[18] PricewaterhouseCoopers (2007): "Review of FSA Projection Rate"
[19] This has been calculated using the Bank of England nominal gilt forward rate curves from 25 March 2010 and extrapolating beyond the 25 years that these are available for by assuming that the forward rate is constant.
[20] This has been calculated by using Bank of England nominal gilt forward rate curves from 25 March 2010 and extrapolating beyond the 25 years that these are available for by assuming that the forward rate is constant.
[21] Dimson, Marsh and Staunton (2002) "Triumph of the optimists, 101 years of global investment returns"

D.26 PricewaterhouseCoopers (2007)[22] used two methods to estimate the expected return on corporate bonds. Their first based on the credit default swap market estimated an expected return of 0.75% pa above government bonds for bonds rated higher than BBB. Their second method was to use the principles underlying CAPM and multiplied an empirical debt beta by their equity risk premium of 3% - 4% pa to produce expected additional returns in the range of 0.3% - 0.8% pa, on top of which there was the possibility of a liquidity premium.

D.27 Historical expected defaults and recovery rates can be found in documents issued by ratings agencies such as Standard and Poor's (2010)[23] and Moody's (2010)[24]. These can then be used to estimate future expected losses and hence expected returns on corporate bonds.

D.28 The Bank of England use a structural credit risk model calibrated to historical default frequencies to separate the credit spread into its constituent parts. This model was the result of studies by Churm and Panigirtzoglou (2005)[25] and Bank of England (2007)[26]. This model uses option pricing methodology in a similar way to the model by Merton (1974)[27] to value the payoff to equity and bond holders. The results from this model are illustrated in the following Bank of England (2009) graph.



[22] PricewaterhouseCoopers (2007) "Review of FSA Projection Rates"
[23] Standard and poor's (2010) "Default, Transition and Recover: 2009 Global Corporate Default Study and Ratings Transitions"
[24] Moody's (2010) "Corporate Default and Recovery Rate 1920 – 2009"
[25] Churm and Panigirtzoglou (2005) "Decomposing credit spreads" Bank of England Working Paper no. 253
[26] Bank of England (2009) "Financial Stability Report June 2009"
[27] Merton (1974) "On the pricing of corporate debt: the risk structure of interest rates"

D.29 In setting the expected corporate bond return assumptions it is important to also consider current corporate bond spreads which were 1.3% for AA bonds as at 30 April 2010[28].

Equity Returns

D.30 The table below shows the return on equities, bonds and bills, together with the rate of inflation and GDP (where readily available) over 1900 to 2000 and 1900 to 2009:

		UK		US		World	
		Real	Nominal	Real	Nominal	Real	Nominal
Returns % pa 1900 - 2000	Equities	5.8	10.1	6.7	10.1	5.8	9.2
	Bonds	1.3	5.4	1.6	4.8	1.2	4.4
	Bills	1.0	5.1	0.9	4.1	0.9	4.1(2)
	Inflation		4.1		3.2		3.2(2)

		UK		US		World	
		Real	Nominal	Real	Nominal	Real	Nominal
Returns % pa 1900 - 2009	Equities	5.3	9.4	6.2	9.3	5.4	8.6
	Bonds	1.3	5.3	1.9	5.0	1.7	4.7
	Bills	1.0	5.0	0.9	3.9	0.9	3.9
	Inflation		3.9(1)		2.9(1)		3.0(1)
	GDP			2.1 p/capita			

D.31 The table below shows the excess return on equities over each of bonds, bills, GDP and inflation (where readily available), from 1900 to 2000 and 1900 to 2009:

		UK	US	World
Excess of Equity Return(1) 1900-2000	Over bonds	4.4	5.0	4.6
	Over bills	4.8	5.8	4.9
	Over inflation	5.8	6.7	5.8

[28] The option adjusted spread on BofA Merrill Lynch AA Sterling Corporate Index (UR20) was 131bps at at 30/04/2010

		UK	US	World
Excess of Equity Return(1) 1900-2009	Over bonds	3.9	4.2	3.7
	Over bills	4.2	5.2	4.4
	Over inflation	5.3	6.2	5.4

Sources:
Dimson, Marsh and Staunton: "Triumph of the Optimists: 101 Years of Global Investment Returns", Princeton University Press
Dimson, Marsh, Staunton and Wilmot: "Credit Suisse Global Investment Returns Yearbook 2010"
(1) calculated by GAD using information from the above sources
(2) US data

D.32 The Equity Risk Premium (ERP) is the excess of the expected return over the 'risk free' rate.

D.33 When assessing the 'risk-free' rate, the option of using the return on bonds or bills needs to be considered. Dimson, Marsh and Staunton (2002)[29] state "of these two only treasury bills can be considered risk free."

D.34 The historic information above shows that UK and US equities have both returned 5.4% pa above their respective country treasury bills, whereas 'world' equities have returned 4.7% pa over 'world' treasury bills.

D.35 The 'world' estimate is suggested by PricewaterhouseCoopers (2003)[30] as the most appropriate measure when providing an estimate of prospective ERP for UK retail investors.

D.36 The historical returns may not give a good estimate of the current ERP required by investors and this causes much debate about what the prospective ERP really is. Many (such as Globob and Bishop (1997)[31], Siegel (1999)[32], Cornell (1999)[33], Dimson, Marsh and Staunton (2002), Brigham, Eugene and Ehrhardt (2002)[34]) suggest that future returns are likely to be lower than in the past.

D.37 The two main reasons for this are summarised by PricewaterhouseCoopers (2003):

"(a) Many markets will simply have performed better than investors expected in the past. Observed returns will be larger than those investors actually required to justify them investing in equities. This is the case for the US in particular, which in the 20th century experienced a sustained period of political stability and economic growth.

(b) The ERP will have fallen over the historical period as equity markets became more diversified and efficient while investors' confidence in the future grew. The result of this would be a significant re-rating of equities upward, which is unlikely to be repeated in future."

[29] Dimson, Marsh and Staunton (2002) "Triumph of the optimists, 101 years of global investment returns"
[30] PricewaterhouseCoopers (2003) "Rates of Return for FSA prescribed projections"
[31] Globob and Bishop (1997) "What long-run returns can investors expect from the stock market?"
[32] Seigel (1999) "The Shrinking Equity Risk Premium"
[33] Cornell (1999) "The Equity Risk Premium"
[34] Brigham, Eugene and Ehrhadt (2002) "Financial Management"

D.38 We have summarised estimates of the prospective ERP in the table below from a number of studies.

	Dimson, Marsh and Staunton (2002)	Carhart and Winkelmann (2003)[35]	PWC (2007)[36]	Graham and Harvey (2009)[37]	Fama and French (2002)[38]	Siegel (1999)
Prospective ERP Estimate	2.5% to 4% over cash	3%* over US treasury bonds	3% to 4% over bonds	3.46%* over US treasury bonds	2.55% to 4.32% over 6 month commercial paper	Less than 1.5% to 2.5% over bonds

* US ERP estimate only

D.39 In generating the total equity return assumption we have used expectations of a gradual return to a higher interest rate environment to derive an appropriate return on cash.

Investment expenses

D.40 If no allowance is made for active management outperformance in assumed asset class returns then it is consistent to consider passive investment management fees when setting investment expenses assumptions.

D.41 The fees in the passive investment management space are very competitive and therefore there is usually little observed difference between the various managers. The typical fees are summarised in the table below:

Asset Class	Annual Passive Management Fee
UK Equities	0.05% to 0.1%* pa
Overseas Equities	0.13% to 0.22%* pa
UK Gilts (FI or IL)	0.03% to 0.1%* pa
UK Corporate Bonds	0.08% to 0.15%* pa

* depending on size of funds under management

D.42 It should be noted that the Pensions Regulator scheme funding analysis dated November 2009 reports on additions over the risk free rate that are net of expenses.

[35] Carhart and Winkelmann (2003) "The Equity Risk Premium, Modern Investment Management"
[36] PricewaterhouseCoopers (2007) "Review of FSA Projection Rates"
[37] Graham and Harvey (2009) "The Equity Risk Premium amid a Global Financial Crisis"
[38] Fama and French (2002) ""The Equity Premium"

Appendix E - Comparison of life expectancies on alternative bases

The tables below show life expectancy at age 65 on some relevant mortality bases:

Life expectancy at age 65

Men	**65 in 2010**	**65 in 2030**
'Best estimate' basis SAPS + ONS principal projections	21.8	23.9
'Typical funding' basis / 'gilts' basis SAPS -2 yrs + ONS principal projections	23.6	25.7
Previous review 85% population + previous ONS principal projections	21.5	23.3
PPF S179 basis (PCMA00 mc floor 1.25%)	22.6	25.1
Industry median From tPR report (note that this uses a 2008 baseline)	22.0	23.6

Women	**65 in 2010**	**65 in 2030**
'Best estimate' basis SAPS + ONS principal projections	24.7	26.7
'Typical funding' basis / 'gilts' basis SAPS -2 yrs + ONS principal projections	26.6	28.6
Previous review 85% population + previous ONS principal projections	24.0	25.7
PPF S179 basis (PCFA00 mc fl 1.00%)	24.7	26.6
Industry median From tPR report (note 2008 baseline)	not quoted	

Appendix F – Defined benefit assumptions at previous review

Mortality
85% of the projected mortality used for the UK 2004-based principal population projections. The same proportion of population mortality was assumed for widows and widowers.

Proportions 'married'
In line with the 2003-based projections

Rates of 'remarriage'
In line with the 2003-based projections

'Marital' age differences
In line with the 2001 census data

Administration expenses
0.2% of band earnings

Investment expenses
Implicit in the financial assumptions

Weights (membership profile)
Derived from data analysed by the Department for Work and Pensions

Contingency margin
7.5% of the calculated rebate

Financial assumptions	
Pre-retirement net real discount rate over earnings	1% pa for those at the oldest ages, rising to 2.0% pa for those aged 50 and rising further to 2.5% pa for those aged 35 or less
Post-retirement net real discount rate over inflation	2.00% pa
Nominal discount rate for year before SPA	5.00% pa

Appendix G – Defined contribution assumptions at previous review

Summary of assumptions for COMPS

Economic Assumptions

As for COSRS

Demographic Assumptions

No allowance for mortality before SPA.

PMA92/PFA92 with medium cohort improvements for mortality above SPA.

100% proportion married at SPA.

Age difference with spouse as for COSRS

Expenses Assumptions

0.2% addition as for COSRS.

7.5% loading on the annuity factor to reflect the allowance made in the annuity pricing bases for administration, commission and the cost of capital.

Other

The rebate is the higher of that calculated for men and women rather than the weighted average of the two. This is due to the requirement to pay the same rebate to men and women even where their SPA is different.

Summary of assumptions for APPs

Economic Assumptions

As for COSRS

Demographic Assumptions

As for COMPS

Expenses Assumptions

1.0% reduction in the pre-retirement rate of return.

7.5% loading on the annuity factor to reflect the allowance made in the annuity pricing bases for administration, commission and the cost of capital.

Other

The rebate is the higher of that calculated for men and women rather than the weighted average of the two. This is due to the requirement to pay the same rebate to men and women even where their SPA is different.