



# Career Average Revalued Earnings ("CARE") Pension Scheme

Actuarial valuation as at 30 September 2010

Memorandum issued by The Pensions Trust addressed to the sponsoring employers on the proposed assumptions to be adopted in calculating Technical Provisions

October 2010

## Introduction

This paper is designed to describe and record the issues the Trustee is proposing to take into account in determining their funding objective(s), and the method and assumptions to be used in calculating the scheme's Technical Provisions for the actuarial valuations as at 30 September 2010.

Pages 1 to 6 set out the general background on the valuation process.

Pages 7 onwards detail the proposed assumptions to be used for the valuation. They are then followed by a series of reference sheets describing the key issues in selecting any given assumption.

Finally, there are two appendices providing additional details on the challenging area of mortality and a guide on risks.

In this report the term “best estimate” is used on a number of occasions. This is intended to reflect a measure, assumption or judgement that does not incorporate any adjustments to reflect matters such as the desired outcomes (i.e. it provides neither a deliberately optimistic or pessimistic view). The word “prudent” or “prudence” is also used in this report by which it means taking a margin for caution compared to “best estimate”.

## The Pensions Regulator’s Code of Practice

**We recommend that you should revisit the Code of Practice from the Pensions Regulator** (found at [www.thepensionsregulator.gov.uk](http://www.thepensionsregulator.gov.uk)) in advance of considering the issues raised in this document. The particularly relevant sections are:

- A Funding Method (Code of Practice section 72-75)
- Financial and Demographic assumptions (Code of Practice section 76-94)

# Overview of Scheme Funding

## Legislative Background

The current defined benefit funding legislation came into force on 30 December 2005. This sets out the framework for funding defined benefit occupational pension schemes in the UK, together with:

- documents issued by the Pensions Regulator, and
- Guidance Notes adopted, and Standards issued, by the Board for Actuarial Standards.

The following is a re-cap of key elements of the legislation:

- Schemes are subject to a “**Statutory Funding Objective**”, which is that they must have sufficient and appropriate assets to cover their “Technical Provisions”.
- “Technical Provisions” is defined as “the amount required, on an actuarial calculation, to make provision for the scheme’s liabilities”.
- In effect, **schemes must have a funding target of 100% of their Technical Provisions.**
- Assets are taken at their value in the scheme accounts (with a small number of exceptions).
- Where a scheme’s assets are less than the Technical Provisions a “**Recovery Plan**” must be prepared. This must show how contributions from the employers and members are projected to meet the Statutory Funding Objective over a stated period.
- A **Schedule of Contributions** must be prepared setting out the contributions to be paid over the following five years, or over the period of any Recovery Plan if longer.
- In many cases, the assumptions used to calculate Technical Provisions will also be used to calculate the contributions required to cover any future service benefits and any shortfall of assets compared to Technical Provisions. However, this is not a requirement of the legislation. In particular, it is possible to assume a different rate of investment return for the period of a Recovery Plan.
- Trustees must set out their approach to the funding of the scheme in a “**Statement of Funding Principles**”.
- Trustees are required to take actuarial advice on the valuation method and assumptions to be adopted, the Statement of Funding Principles, the Schedule of Contributions, and any Recovery Plan but it is for the trustees to determine the method and assumptions to be used in calculating the Technical Provisions.
- **The valuation and all the associated documents required must be completed within 15 months of the effective date of the valuation.**

## The Pensions Regulator’s Role

### Funding Triggers

The Pensions Regulator continues to take an active role in monitoring the funding plans of pension schemes. They have indicated that they will investigate schemes where the Technical Provisions are set at too low a level or where the recovery period is too long. A description of The Regulator’s approach is given in a document which can be downloaded from their website.

The Regulator uses various “triggers” to identify ‘higher-risk’ cases to investigate further. The triggers relate to the level of Technical Provisions and the length and shape of any recovery plan. The Regulator has made it very clear that the triggers are not and should not be seen as funding targets for pension schemes, and they will in any case spot-check funding in other schemes. However, they give a useful indication of the Regulator’s expectations.

**In relation to the length of the Recovery Plan, the Regulator reminded trustees that they are expected to negotiate robustly when agreeing deficit contributions and should seek to recoup any deficit “as soon as the employer can reasonably afford”, taking into account its business plans.**

Also, while there is not a specific mortality trigger, the Regulator is closely monitoring these assumptions, and is very conscious of the issue of mortality improvements and the risks posed by rising longevity.

### Further guidance

More recently, the Regulator has issued statements to trustees (in October 2008) and employers (in February 2009) as well as a general statement in June 2009 setting out their position in the current financial climate. These can be found on the Regulator’s website but re-iterate their belief in the principles on which the funding regime is based, whilst acknowledging that economic conditions will have reduced the financial strength of many employers.

A key message in the Regulator’s statements is that “*Technical Provisions should not be compromised to make a recovery plan affordable*” but that trustees can be flexible when considering recovery plans and should be realistic about what it is reasonably affordable for the employer. The current economic conditions are likely to have the effect of increasing Technical Provisions (as the Trustees take more prudent assumptions to protect against future downside risk) and increasing the length of Recovery Plans (since employers may be less able to afford contributions, particularly in the short term). The Regulator is therefore expecting an increasing number of schemes to ‘trigger’ further review by having Recovery Plans longer than 10 years, but also acknowledges that many of these will be appropriate (and acceptable) given the circumstances.

Overall the Regulator was keen to point out that “Pension scheme trustees and employers should be assured that the Regulator will continue to apply the flexibilities in the system pragmatically, looking for outcomes in the best interests of the scheme and sponsor.”

## Contribution rule

The legislation requires that in most circumstances trustees have to obtain the employer's agreement to:

- the method and assumptions for calculating the Technical Provisions,
- the Statement of Funding Principles,
- the Schedule of Contributions, and if appropriate,
- the Recovery Plan

However, if the Scheme rules currently give the employer no influence on the contribution rates payable, the legislation only requires the Trustee to consult with the employer and does not need agreement between the parties.

The Scheme’s Trust Deed and Rules implies that the Trustee will need to consult with the employers regarding the above matters.

## Key Aspects of Scheme Funding

### Funding Objectives

As stated above, trustees are required to pursue the “Statutory Funding Objective” of having sufficient assets to meet their Technical Provisions. However, the Trustee may also set secondary objectives when agreeing the funding principles. Please refer to Reference Sheet 1 for details of any secondary funding objective that can be considered, which involves also targeting a level of funding on an alternative set of assumptions.

In an ongoing scheme, the long term cost of benefits is determined by the benefit structure, and actual experience as regards investment returns, salary increases, mortality, etc.

**The funding objective does not determine the long term cost of a scheme, but it does influence the pace of funding.**

The more cautious the method and assumptions underlying a particular funding objective, the faster the pace of funding will tend to be. Therefore, if the Trustee is concerned about the long term ability of an employer to pay the contributions that may be required, it is more likely to want higher contributions paid in the short term in order to provide security for their members.

The ability and willingness of the employer to pay the contributions required (the “employer's covenant”) continues to be a key consideration for the Trustee in setting our method, assumptions and funding principles.

The Trustee has decided that the primary funding objective for each scheme will be to reach 100% of the technical provisions within the period of any agreed recovery plan, unless you wish to adopt a more prudent objective. We will agree any secondary funding objective with you.

### Employer Covenant

The Pensions Regulator has stated that:

***“It is essential for the trustees to form an objective assessment of the employer's financial position and prospects as well as his willingness to continue to fund the scheme's benefits (the employer's covenant). This will inform decisions on both the Technical Provisions and any recovery plan needed.”***

In terms of the Technical Provisions, a strong employer covenant allows trustees (if they wish) to choose assumptions with a smaller margin for prudence compared to the “best estimate” assumptions. A weak employer covenant generally implies that trustees should choose assumptions with a larger margin for prudence.

When looking at a Recovery Plan, the covenant assessment is critical in determining affordability, remembering that any deficit should be paid off as soon as the employer can reasonably afford. If adequate short term funding is not available, the granting of contingent assets to the Scheme may be an effective way for the Trustee to be assured of additional funding if adverse circumstances were to arise. We can provide more information on contingent assets on request.

**It is essential that an objective employer covenant assessment is made and is clearly documented. The Regulator will often ask trustees for evidence of this assessment if a funding valuation triggers further review.**

It is also important to note that assessing the employer's covenant is not a ‘one off’ process as trustees are expected to continue to monitor the employer's willingness and ability to make future contributions so that they can protect their members' interests if warning signs emerge. In their statement issued in June 2009, the Regulator re-iterated the importance of assessing the employer

covenant and monitoring it on a regular basis. They also highlighted a number of questions that the Trustee should be able to answer including:

- What are the employer's legal obligations to fund the scheme?
- What is the effect of the employer's corporate group structure?
- What is the employer's ability to meet ongoing demands as they fall due?
- What is the employer's ability to make up for any adverse experience?
- What would be the scheme's position on insolvency of the sponsor?

Further details can be found on the Regulator's website.

## Choosing Assumptions

The assumptions for calculating a scheme's Technical Provisions can be divided into financial and statistical assumptions and are covered individually below. The key principles in determining assumptions though (most of which feature in the legislative framework), are that the Trustee should consider:

- prudence, and if applicable, appropriate margins;
- a range of values or options for each assumption. When considering these, trustees should ensure they understand the evidence for, and rationale behind, the choices put forward;
- rates of anticipated return on the scheme investments;
- sensitive assumptions, where even small deviations in the experience from the assumed values have a significant impact on the adequacy of the Technical Provisions;
- the current price of UK government securities and the information this provides about the expected return on investments which are low risk in relation to the liabilities;
- relevant economic and financial factors such as price and wage inflation, and the expected returns on, and risks associated with, asset classes other than UK government securities;
- the trustees' investment policy and the extent to which the expected returns on, and the risks associated with, actual investments held should be reflected in assumptions about investment returns;
- factors particular to the employer, or the employer's industry, affecting matters such as pay increases, rate of withdrawal from membership and recruitment, etc;
- the latest available relevant data on likely future mortality rates, recognising the sustained trend of increasing life expectancy in recent years;
- the characteristics of the scheme members (in setting mortality assumptions), such as occupational or geographic factors;
- for schemes open to new members, the implications of those assumptions as to age, sex and number of new joiners for future contributions; and
- the effect that changes to economic conditions might have on the relative levels of funding and solvency.

As an actuarial valuation has already been carried out under the current legislative regime, The Pensions Regulator's code of practice (and the legislation) states that any changes in assumptions from the previous valuation must be justified by a change of legal, demographic or economic circumstances.

**These changes may be general or scheme-specific but the Trustee should record the rationale behind each change.**

The issue of sensitivity of Technical Provisions to changes in key assumptions is covered by generic illustrations contained in the Reference Sheets.

The illustrations show the effect of changes in individual assumptions and there is a compounding effect if more than one assumption is changed (so the combined effect may be greater than the sum of the individual effects). If you wish to know the potential effect of a particular combination of changes on the Scheme, we can supply this information on request.

## Scheme Specific Advice

In the following section, you will find the Trustee's decisions regarding assumptions following discussion with the Scheme Actuary. These are based upon the Scheme benefits, the assumptions used in the previous actuarial valuation and the following scheme specific information.

### Employers covenant

As mentioned previously the Trustee's assessment of the employers' covenant is crucial to determining suitable long term strategy, assumptions, and ultimately deciding on appropriate contribution rates. This will vary over time depending on the fortunes of the employers and will also be affected by the overall funding position of the Scheme. It is therefore important that the Trustee forms an updated view on the strength of the employers' covenant, and continues to monitor this both as the valuation discussions progress and in future after the valuation is completed.

For the purpose of the Trustee's decisions, it has been assumed that the employers have a medium strength covenant. If in fact it turns out that the covenant is weaker (or stronger) than this, then we may need to consider more prudent (less prudent) assumptions than those suggested below.

### Investment strategy

The investment strategy of the Scheme is to invest 65% in Equities, 27.5% in Fixed Interest Bonds and 7.5% in Properties.

As the actuarial valuation is a long term planning exercise, designed to support the ultimate funding of the plan, understanding the long term investment strategy (together with the strength of the employers' covenant) is fundamental to setting suitable discount rates. Any anticipated changes in investment strategy may have funding implications.

Information on how discount rates have been set can be found in Reference Sheet 3.

### Valuation Method

The Scheme is open to new entrants and open to future accrual. The Trustee proposes using the Projected Unit Method, with a control period equal to one year.

A feature of this method is that the future service contribution rate produced, expressed as a percentage of earnings, would be expected to remain reasonably stable from year to year provided the age and gender profile of the active members remains broadly unchanged. For a scheme open to new entrants, assuming the flow of new entrants means that the age and gender profile remains broadly unchanged; the Projected Unit method will produce a future service contribution rate which can be expected to remain reasonably stable.

Future service contribution rate calculations will exclude Employers who were expected to cease future accrual with effect from 1 April 2011 and join the DC Scheme for all existing members.

## Suggested Assumptions for Technical Provisions

BACKGROUND ECONOMIC CONDITIONS	Last valuation	This valuation
Gilt Yield	4.8% p.a.	3.9% p.a.
Market Implied Inflation	3.4% p.a.	3.3% p.a.

	Last valuation	Suggested assumption	Key scheme specific considerations and rationale for suggested change
<b>Valuation Method</b>	Projected Unit Credit with a one-year control period	Projected Unit Credit with a one-year control period	See Reference Sheet 10 for further guidance.
<b>Assumptions for Orphan Employer Liabilities</b>	Technical provision assumptions as detailed below	Solvency valuation assumptions as outlined on page 12	Greater consistency between the approaches used for valuing Orphan Employer liabilities for calculation of debt payments and for scheme funding. Debt payment calculations are based on the assumption that the liabilities will be discharged by purchase of annuities i.e. "buy-out basis".
<b>FINANCIAL ASSUMPTIONS</b>			
<b>Retail Price Inflation</b>	2.9% p.a.	3.0% p.a.	See Reference Sheet 2 for further guidance.
<b>Consumer Price Inflation</b>	N/A	2.6% p.a.	See Reference Sheet 2 for further guidance.
<b>Pre retirement discount rate</b>	6.1% p.a.	6.5% p.a. (assumes medium covenant i.e. 65% prudence and current investment strategy)	Investment strategy and employers covenant as set out above together with changes in market conditions. The previous valuation adopted the 70% prudence equity return. See Reference Sheet 3 for further guidance.
<b>Post retirement discount rate</b>	5.3% p.a.	4.3% p.a.	Investment strategy and employers covenant as set out above together with changes in market conditions. See Reference Sheet 3 for further guidance.
<b>Earnings growth</b>	4.4% p.a.	4.5% p.a.	Consistent with previous valuation assumption allowing for change in inflation. See Reference Sheet 4 for further guidance.
<b>Pension revaluation in deferment/Revaluation of Earnings for service accrued pre 1 April 2011</b>	2.9% p.a.	3.0% p.a.	See Reference Sheet 5 for further guidance. Based on the Retail Price Index.

	Last valuation	Suggested assumption	Key scheme specific considerations and rationale for suggested change
<b>Pension revaluation in deferment/Revaluation of Earnings for service accrued post 1 April 2011</b>	2.9% p.a.	3.0% p.a.	See Reference Sheet 5 for further guidance. Based on the Retail Price Index.
<b>Pension increases in retirement</b>	Pre 6 April 1988 GMP (nil) = 0% p.a. Post 5 April 1988 GMP (LPI 3%) = 2.9% p.a. Excess over GMP (LPI 5%) = 2.9% p.a. Excess over GMP (LPI 2.5%) = 2.25% p.a.	Pre 6 April 1988 GMP (nil) = 0% p.a. Post 5 April 1988 GMP (LPI 3%) = 2.2% p.a. Excess over GMP (LPI 5%) = 2.6% p.a. Excess over GMP (LPI 2.5%) = 2.1% p.a.	Changes are consistent with suggested update to inflation assumption and statistical distribution. Changes also reflect the change in the index on which pension increases are based from Retail Price Index to Consumer Price Index.  See Reference Sheet 5 for further guidance.
<b>Expenses</b>	Allowance in the future service contribution rate as a percentage of earnings per annum.	Allowance in the future service contribution rate as a percentage of earnings per annum	The Scheme is open to new entrants.  See Reference Sheet 8 for further guidance.
<b>Recovery Plan</b>	Not applicable as the Scheme was in surplus at the last valuation.	Allowance for additional returns above the rates underlying the Technical Provisions for 10 years after inception date of any new recovery plan, reverting to a prudent return thereafter.	See Reference Sheet 3 for further guidance.
<b>DEMOGRAPHIC ASSUMPTIONS</b>			
<b>Mortality</b>	Non-Pensioners: PxA92C2027MC; Pensioners: PxA92C2015MC	SAPS S1 All Pensioners (Amounts), Year of Birth, CMI_2009, long term improvement rates of 1.5% pa for males and 1.25% pa for females.	Changes reflect more recent research into national pension scheme mortality (base table) and the latest projection methodology (future improvements).  See Reference Sheet 6 for further guidance.
<b>Withdrawal rates</b>	Sample rates: Age 30: 15.0% Age 40: 10.0% Age 50: 0% Age 60: 0%	Sample rates: Age 30: 15.4% Age 40: 12.0% Age 50: 9.5% Age 60: 5.6%	Change reflects latest investigation.  See Reference Sheet 7 for further guidance.
<b>Commutation allowance</b>	No Allowance	No Allowance	Unchanged since the last valuation.  See Reference Sheet 8 for further guidance.
	<b>Last valuation</b>	<b>Suggested assumption</b>	<b>Key scheme specific considerations and rationale</b>

			<b>for suggested change</b>
<b>Early Retirement allowance</b>	No Allowance, all members are assumed to retire at their Normal Retirement Age, 65.	No Allowance, all members are assumed to retire at their Normal Retirement Age, 65.	Unchanged since the last valuation. <i>See Reference Sheet 9 for further guidance.</i>
<b>Ill-health Early Retirement allowance</b>	Sample rates (per 1,000 lives): Age 30: 0.2 (males); 0.2 (females) Age 40: 0.5 (males); 0.8 (females) Age 50: 2.8 (males); 3.6 (females) Age 60: 2.4 (males); 2.0 (females)	Sample rates (per 1,000 lives): Age 30: 0.1 (unisex) Age 40: 0.3 (unisex) Age 50: 1.8 (unisex) Age 60: 9.5 (unisex)	Change reflects latest investigation. <i>See Reference Sheet 9 for further guidance.</i>
<b>Family statistics</b>	90% married at retirement or earlier death; Males three years older than their wives	75% married at retirement or earlier death; Males three years older than their wives	Change reflects latest investigation. <i>See Reference Sheet 9 for further guidance.</i>

## Additional guidance on mortality

### Base table

A key initial decision on the mortality assumptions is the appropriate standard table to use as a starting point. The SAPS tables that are now available are based on more recent, and more relevant, data than either the “92 series” tables or the “00 series” tables which you may have seen in the past. We therefore believe it is appropriate to use these standard tables as a starting point. Further details can be found in Appendix 1 on mortality research.

**The Trustee has decided to use the SAPS Standard tables as the standard table to use for the mortality assumptions, projected from 2003 (the central year of the data on which they are based) to the valuation date in a manner consistent with the ‘future improvements’ discussed below.**

### Allowance for future mortality improvements

The next strand to the mortality assumptions is the rate of future improvements in mortality rates (leading to increased life expectancy). This is a very subjective area of assumption setting and a range of projections are available.

It is important to note that there could still be wide variations in future mortality improvement levels and this will continue to be a material source of risk from a Scheme funding perspective. As part of the initial valuation results, the Scheme Actuary will illustrate the impact of varying the levels of improvement.

**The Trustee has decided to use the latest projection methodology for future improvements being the CMI projections with long term improvement rates of 1.5% p.a. for males and 1.25% p.a. for females.** Further information is given in Reference Sheet 6.

### Comparison of life expectancies under the 2007 assumptions and the 2010 proposed assumptions

	Sex (M/F) and current age	Assumption in 2007 valuation	Proposed assumption in 2010 valuation
Base Table		92 series	SAPS “Standard”
Projection rate method		Calendar Year (2027 for non-pensioners, 2015 for pensioners)	Year of birth
Projection rates		Medium Cohort	CMI [2009]
Long term improvement rate		n/a	1.5% pa for males, 1.25% pa for females
Total life expectancy in years at age 65	M 45	87.4	89.5
	F 45	90.2	91.0
	M 65 pensioner	86.6	87.2
	F 65 pensioner	89.4	89.0

Using the proposed mortality assumptions for the 2010 valuation would increase liabilities by approximately 2% to 3% depending on the liability profile of a particular scheme, relative to the 2007 assumptions.

## Valuations for Other Purposes

As well as the ongoing valuation for each scheme, the Scheme Actuary will also carry out PPF and solvency valuations:

### Pension Protection Fund (or Section 179) valuation

The Scheme Actuary will prepare a valuation and certification on the PPF. The assumptions and method underlying the PPF valuation calculations are set down in PPF guidance.

### Solvency valuation

The Scheme Actuary will estimate the financial position of the Scheme on an annuity buy-out basis, i.e. assuming the Scheme terminated on the valuation date and the Trustee attempted to secure members' benefits via annuity purchase. This calculation is important as it gives a guide as to the amount of buy-out debt and, in addition, forms the basis of any debt on employer calculations required on cessation of participation.

The approach to the derivation of the proposed key solvency valuation assumptions is outlined in the table below:

<b>Rate of interest</b>	
Pre-retirement	Annualised FTSE Actuaries' Government Securities 20 Year Fixed Interest Index minus 0.5%
Post retirement	Annualised FTSE Actuaries' Government Securities 20 Year Fixed Interest Index
<b>Inflation:</b>	Bank of England 15 year spot rate
<b>Pension revaluation in deferment/Revaluation of earnings:</b>	
RPI	Inflation
PPF compensation cap	(Minimum of 5% and inflation) plus 1.5%
<b>Pension increases in payment:</b>	
In line with RPI	Inflation
In line with RPI up to 2.5% p.a.	(Minimum of 2.5% and inflation) less 0.1%
In line with RPI up to 3% p.a.	(Minimum of 3.0% and inflation) less 0.1%
In line with RPI up to 5% p.a.	(Minimum of 5.0% and inflation) less 0.1%
<b>Mortality</b>	
Pre retirement	None
Post retirement	PNMA00 (males) and PNFA00 (females) (year of birth) tables. Medium cohort projections with a 1% p.a. underpin allowance for future mortality improvements.
<b>Dependants' pensions</b>	At retirement, 90% of male members and 80% of female members are assumed to have a dependant of the opposite sex, with males being 3 years older than females. After retirement, the proportion is derived based on 90% (or 80%) proportion at retirement and the mortality assumption, with no allowance for any new dependants after retirement.
<b>Allowance for expenses</b>	None

Noticeably, the discount rates are significantly lower those used in the calculation of the Technical Provisions. This is primarily because an insurer will take significantly reduced risks in its investment portfolio and will aim to build margins into the basis to cover against a range of adverse contingencies.

In the Scheme Actuary's opinion, as a package, these assumptions are a reasonable approximation to insurance company pricing.

## Conclusion

It is now appropriate that we discuss the contents of this report and agree the assumptions on which the Scheme Actuary carries out his calculation of the Technical Provisions.

# REFERENCE SHEET 1

## Secondary Funding Objectives

The following targets could be used to set additional (or secondary) funding objectives for a pension scheme, over and above the 'Statutory Funding Objective'.

### "Buy Out" solvency target

This involves targeting a certain level of solvency on a wind-up basis which involves estimating the cost of buying out benefits with an insurance company. A 100% target is a very secure approach from the perspective of members and trustees, but is not always financially possible from the employer's perspective. Even if it is not set as the funding target, the buy-out funding level will be disclosed in the valuation report.

Traditionally trustee bodies and employers have often thought of a buy-out related funding objective as impractically expensive. However increasingly sponsors are aware of the risks inherent in defined benefit arrangements and may be more willing to consider such a target, particularly if targeted over a reasonable period of time. This might be particularly the case for more mature schemes closed to new entrants.

### Employer Accounting target

This involves aiming for the assets of the fund to be adequate to cover accrued liabilities on the FRS17 basis. It should be noted that depending on the levels of longer dated corporate bond yields (which are used for valuing FRS17 liabilities) relative to gilt yields, this target can at certain times be considered too weak from a Pensions Regulator perspective.

### PPF target

This involves aiming for the assets of the fund to be adequate to cover PPF liabilities in order to mitigate PPF levies

### Cash Equivalent Transfer Value target

This involves aiming for the assets of the fund to be adequate to pay full cash equivalent transfer values in respect of all members.

## REFERENCE SHEET 2

### Retail Price Inflation

One view is that the 'market's' expectations of long term inflation can be measured by the difference between the yields on long dated index-linked and fixed interest gilts. At 30 September 2010, the annualised real yield (over 5 years) on index-linked gilts (assuming an average of 2.5% p.a. inflation) was 0.52% pa, whilst the annualised yield on long-dated (over 15 years) fixed interest gilts was 3.89% pa. On this basis the long-term rate of inflation implicit in the pricing of these asset classes was approximately **3.3% pa**.

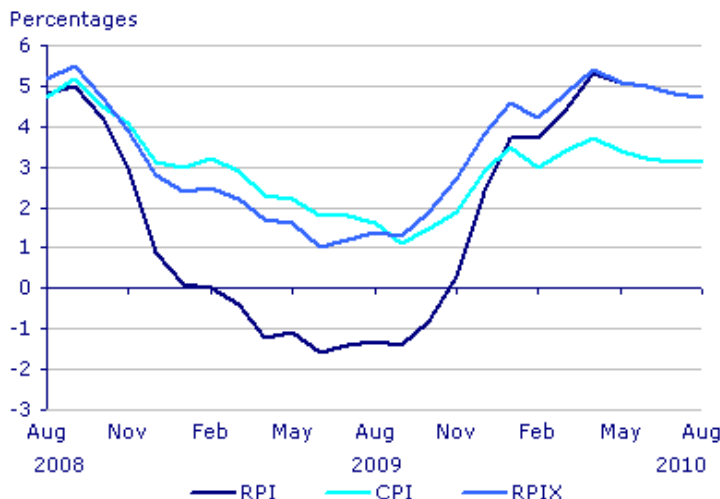
The following table illustrates the movement in this measure of inflation since the 2007 valuations:

Date	Market implied inflation
<b>30 September 2007</b>	<b>3.45%</b>
31 March 2008	3.75%
30 September 2008	3.70%
31 March 2009	3.15%
30 September 2009	3.31%
31 March 2010	3.80%
<b>30 September 2010</b>	<b>3.35%</b>

It can be seen the 'market' expectation of long-term inflation is broadly the same between 30 September 2007 (the date of the last valuation for this cohort of schemes) and 30 September 2010.

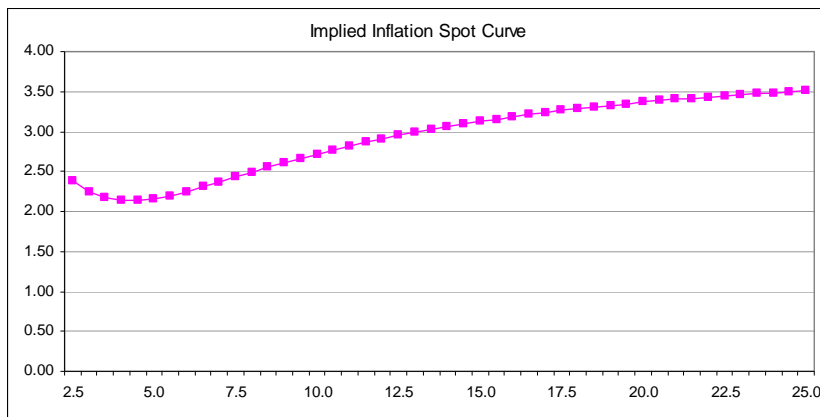
There is a general acceptance that this measure is being distorted by supply and demand issues for index-linked stock versus fixed interest gilts and hence this measure overstates long term inflationary expectations, but the degree of distortion is subjective.

A further indicator is the Bank of England's target inflation rate. The Bank of England currently targets CPI (Consumer Price Index) inflation at 2.0% pa. Pension benefits are however currently based on RPI and recent figures (August 2010) show that RPI inflation was at 4.7% and CPI inflation at 3.1%. However the gap between CPI and RPI is open to debate as different methodologies are used to construct these indices. Indeed over recent years, the gap has varied widely.



It should be borne in mind that if the Bank of England identifies pressures for higher or lower inflation rates, then their action will be aimed at keeping the CPI rate on target, rather than RPI.

Another source of inflation information is the implied inflation spot curve published by the Bank of England, which is shown below as at 30 September 2010.



The above graph shows expectations of inflation (vertical axis) over time (years on the horizontal axis). It indicates that over the next 5 years the market expects inflation to average out at 2.2% per annum, whilst over 20 years average inflation is expected to be 3.4%. Given the long term nature of the pension schemes, it is the longer term projections of inflation that are most relevant.

Given the uncertainty on the pace of emergence from recession and the impact of significant global economic stimulus by Central Banks, the outlook for future RPI inflation is uncertain and there is arguably a need for more prudence.

In the valuations done in 2007 and 2008, the difference between the market implied inflation rate and the assumed RPI increase assumption was 0.5%, whereas for 2009 it was 0.4%. The feedback from The Pensions Regulator received previously is that the 0.5% reduction assumption used is at the optimistic end of the Regulator's inflation spectrum and the Regulator would like to see the inflation rate assumption set at a less optimistic level.

Taking into account the above factors, the RPI increase assumption should be in the range 3.0% pa to 3.3% pa, and suggest that a reasonable point in this range is **3.0% pa** (market implied inflation less 0.3% per annum) at 30 September 2010. This is a different assumption from the rate of 2.9% pa adopted in the 2007 valuations but the change is justified as described above.

Adopting a higher rate of inflation will tend to increase the assessed value of the liability. To illustrate the impact of changes in this assumption in isolation, the value of £1 per annum pension for a 65 year old male including spouse's pensions will increase by approximately 1% if the inflation assumption increases by 0.1% per annum.

**The Government has changed the index it uses to calculate the statutory order that specifies the minimum level of pension increases and leaving service revaluation in private sector defined benefit pension schemes. The legislation on this does not specify a particular measure of inflation however it is now being calculated by reference to Consumer Price Index (CPI) rather than Retail Price Index (RPI) which had been used in previous years. This has raised questions as to future benefit levels and what assumptions should be made in placing a value on these benefits. The effect of this change depends on Scheme's rules and whether they make reference to the statutory order or to Retail Price Index specifically. The Trustee has reviewed the Trust Deed and Rules and determined that CPI will apply for increases to pensions in payment and RPI will be retained for revaluation pre retirement.**

CPI has been published since 1989 and over that period CPI inflation has averaged 2.7% per annum and RPI inflation 3.4% per annum, a difference of 0.7% per annum. However more recent experience has included a period where CPI exceeded RPI.

Both the CPI and the RPI reflect the prices of a basket of items. The constituents of the CPI "basket" are similar to the RPI with the exception of housing costs where the CPI currently excludes council tax, mortgage interest payments, house depreciations, buildings insurance, ground rent and other house purchase costs. All these costs are included in the RPI.

The other very significant difference between the CPI and RPI is in the method of calculation of the index. This would in the Treasury's view explain approximately 0.5% per annum of the long term historic difference, with the balance being the constituent differences.

It's not certain that, over the long term, increases in housing costs will exceed those of other good. Taking into account prudence and the difference in calculation method we suggest an assumption for CPI would be RPI less 0.4% i.e. **2.6% pa.**

***Key points to consider in setting inflation assumption:***

- ***Implied 'market' rate for RPI***
- ***Prudence***
- ***Bank of England CPI target***
- ***Current statement of funding principles***

## REFERENCE SHEET 3

### The Rate of Return on Investments (or Discount Rate)

If the approach is to reflect a low investment risk strategy, an appropriate discount rate would be based on fixed interest gilt returns. Investment risk here is defined as the risk of default. At 30 September 2010 the annualised yield on long term (over 15 years) fixed interest gilts was **3.9% pa**.

If a scheme is expected to continue, the employer is committed and able to fund it, and the investment policy is to include investment in higher expected returning asset classes such as equities, property, hedge funds and corporate bonds then the Trustee considers it reasonable to allow for an investment return in excess of gilts for an appropriate proportion of the liabilities of the scheme. The actual allowance made should be consistent with the investment policy adopted.

In framing the advice, it is interpreted that this strategy is as broadly equivalent to one in which return seeking assets, such as equities and property, are backing non-retired members' benefits and bond (Gilts and corporate bonds) type investments are backing retired members.

#### Pre retirement investment returns

If it is reasonable for on-going valuation purposes to allow for some measure of equity (and other asset classes) out-performance over gilts, although such out-performance is not guaranteed, the level of out-performance to be allowed for is necessarily subjective. Clearly, a greater assumed out-performance reduces the degree of prudence in the basis.

The current best estimate view of the long term return from equities is 8.4% per annum, which is 5.4% higher than the proposed inflation assumption of 3.0%.

The latest survey of major investment institutions by JLT Actuaries & Consultants Ltd (as at 31 March 2010) resulted in average estimated equity returns over the next 10-year period of 8.5%, although opinions ranged from 6.6% to 13.1% for UK equity returns.

The proposed best estimate equity return assumption is therefore not inconsistent with the market.

Once the best estimate return is established, the Trustee considers what degree of prudence it wants to allow for in the investment return assumptions. To help the Trustee in understanding the degree of prudence underlying various assumptions, the following probability distribution of achieving specific real returns from equities, property and a fund of hedge funds over a 10-year horizon in normal market conditions has been produced by the Scheme Actuary. This uses the projection methodology currently adopted for their asset liability modelling.

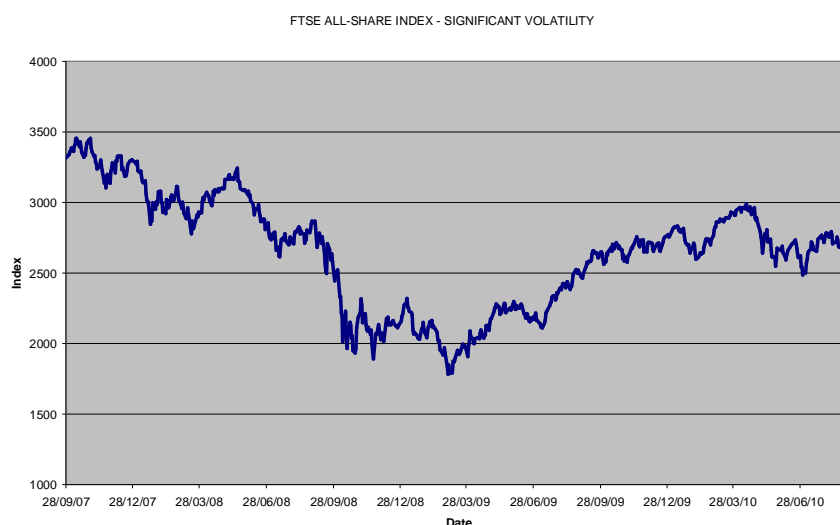
Probability of achieving return	Real return over 10 year period (%)		
	Equities	Property	Fund of Hedge Funds
50%	5.4%	4.5%	4.6%
60%	4.4%	3.8%	3.4%
70%	3.1%	3.1%	1.9%
80%	1.8%	2.3%	0.1%
90%	0.0%	1.1%	-2.5%

Other econometric models would produce different distributions. The probabilities are based on projections of expected returns and other economic assumptions such as inflation. If the actual relationships turn out to be different than projected in the future, then the probabilities of the returns being achieved will be different.

As use of the Fund of Hedge Funds is currently restricted to a very small number of schemes combining these portfolios in an illustrative combination of 80% equities and 20% property results in the following distribution of returns:

Probability of achieving return	Real return over 10 year period (%)
50%	5.4%
60%	4.5%
70%	3.5%
80%	2.4%
90%	0.9%

In addition we are currently in the middle of a recession and whilst there is some optimism that the worst may be over, there is no consensus on the scale or timing of any further recovery. Accordingly there is significant short term uncertainty. The following chart illustrates the significant recent volatility of the FTSE All-Share Index below. Other global equity markets have exhibited similar patterns.



The general policy underlying the assumptions adopted by the Trustee for CARE valuations in recent years was to adopt the 70% prudence equity return assumptions, which would be equivalent to a **6.5% pa** assumed return based on the above notional portfolio table and an inflation assumption of 3.0% pa. This level of return is at the slightly more optimistic end of the spectrum adopted by most UK pension schemes. The Scheme no longer has an objective of funding for a surplus and offering bonuses.

The Pension Regulator's analysis of Recovery Plans (dated November 2009) stated that the average pre-retirement discount rate used in the period 22 September 2007 to 21 September 2008 was 6.5% for valuations representing a 3.1% real discount rate. The Regulator's universe of schemes will encompass a broad range of covenant strengths, and the schemes will have a wide range of investment strategies. In addition, the constituents will be mainly corporates rather than organisations in the Third Sector.

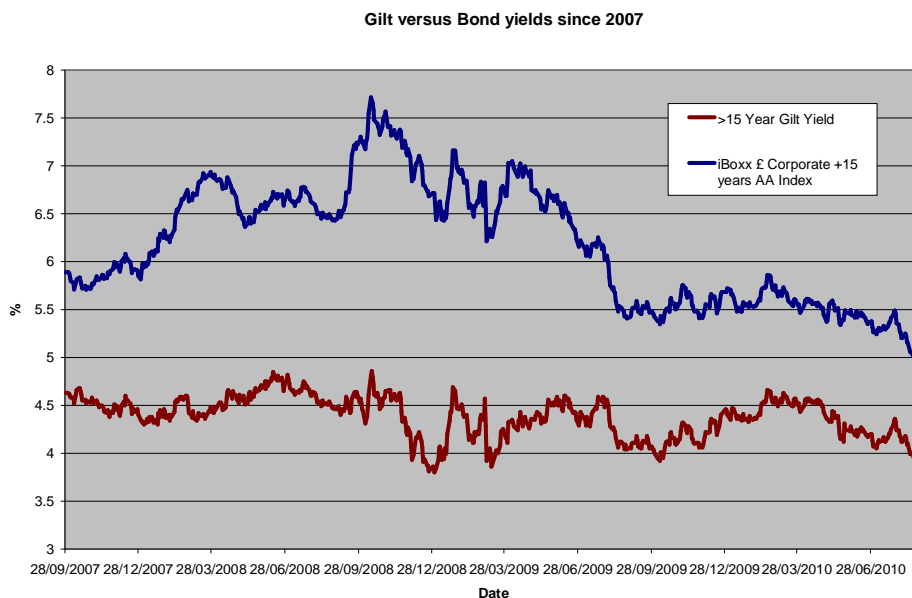
The Trustee has decided on the following degree of prudence it wants to adopt in its assumptions.

Employer covenant	Probability of achieving return	Real return over 10 year period (%)	Discount rate
STRONG	60%	4.5%	7.5%
MEDIUM	65%	4.0%	7.0%
WEAK	70% (minimum)	3.5%	6.5%

## Post retirement investment returns

As far as the post retirement interest rate is concerned, the Trustee invests in non-Gilt type investments such as corporate bonds in respect of current and future pensioners. Indeed the Fixed Interest Fund currently comprises of broadly 40% Gilts and 60% corporate bonds.

The following graph is a comparison of corporate bond yields versus gilt yields since the 2007 valuations:



As can be seen, the yield gap of corporate bonds over Gilts is declining and moving toward longer term averages of the order of 0.7%.

For the 2007 valuation an additional investment return of 0.5% per annum over that of Gilts was adopted for future pensioners and current pensioners.

For the 2010 valuations it appropriate to allow for 60% of the excess of the long term corporate bond yields over Gilt yields (assumed to be 0.7%) and this results in a post-retirement interest rate assumption of **4.3%** pa at 30 September 2010 (i.e. 3.9% plus 0.4%) for both future pensioners and current pensioners.

To illustrate the sensitivity of a change in these assumptions:

- a 0.1% per annum increase to the pre-retirement interest rate, with other assumptions remaining unchanged, reduces the assessed value of retirement benefits for a male age 45, retiring at age 65, by approximately 2%. Decreasing the pre-retirement interest rate increases liabilities by 2%. The effect is larger for younger ages and smaller for older ages.

A 0.1% per annum increase to the post retirement interest rate reduces the assessed value of a LPI retirement pension of a 65 year old by 1%.

## Departures from the standard approach for setting discount rates

The Pensions Trust now operates a mechanism for individual Defined Benefit Schemes to adopt their own scheme specific investment strategy. This can result in an equity (including property) / bond split that is more or less conservative than that implied by the above mechanism. The following adjustments are proposed to reflect this:

- if the actual strategy is more equity orientated than the assumed split, the Trustee can either take further advance credit for equity out-performance in the valuation or instead choose to recognise any further out-performance only as and when it occurs (through emergence of surplus at future valuations). The latter approach will be adopted.

- if the actual strategy is more bond orientated than the assumed split then there is an increased risk that the assumed 100% equity based investment returns pre retirement described earlier will not be achieved in practice. Therefore the Trustee has decided to adopt the following adjustments:
  - the post retirement interest rate is calculated as above. For strategies where this is not achievable (e.g. index-linked gilts held), this will lead to an adjustment to the post retirement interest rate.
  - the pre-retirement interest rate is calculated by looking at the specific mix of residual assets after deducting assets backing pensioner liabilities.

## Deficit spreading contributions

If the valuation discloses a deficit a Recovery Plan is put in place and additional contributions are paid to clear the deficit.

Historically when calculating deficit contributions the investment return assumption used in calculating the value of the deficit contributions has been the investment return assumptions used to calculate the liabilities. As these assumptions have a prudence margin built into them then this increases the contribution requirement from the employer and results in more contributions being paid into the scheme.

The Regulator has made it clear that it is permissible when calculating the contribution requirement to instead use best estimate investment return assumptions, which would lower the contribution requirement from the employer.

The Trustee has decided on the following approach regarding the allowance of any out-performance on the assets when calculating the deficit spreading contributions. Out-performance will only be allowed for on equity and property assets (i.e. the notional portfolio) as follows:

Employer covenant	Underlying asset return for deficit contributions
STRONG / 60% prudence	Return underlying a 50% prudence for the first 12 years after the inception date of the new recovery plan, reverting to a return underlying a 60% prudence thereafter.
MEDIUM / 65% prudence	Return underlying a 55% prudence for the first 12 years after the inception date of the new recovery plan, reverting to a return underlying a 65% prudence thereafter.
WEAK / 70% prudence	Return underlying a 60% prudence for the first 12 years after the inception date of the new recovery plan, reverting to a return underlying a 70% prudence thereafter.

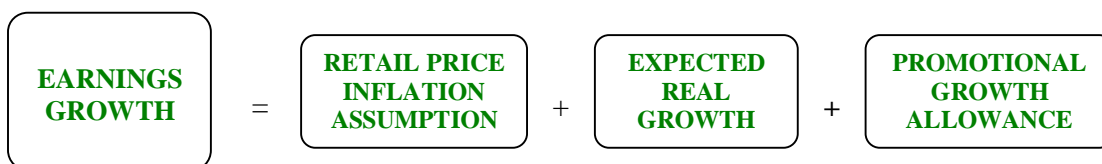
### **Key points to consider in setting discount rate assumptions:**

- Long term investment strategy
- Expected long term asset returns
- Likely volatility of returns
- Strength of employer covenant
- Prudence
- Current statement of funding principles

## REFERENCE SHEET 4

### Earnings Increases

Earnings increases assumption is not a key factor for CARE benefits. Nevertheless it will have an impact for future service contribution rate where the control period on the Projected Unit Method is more than one year and in the case of benefits based on prospective service. In the long-term we expect across the board earnings increases to reflect retail price inflation, plus an addition for productivity growth. It is therefore normal to frame the earnings increase assumption in these terms.



Just how much of an addition to the RPI assumption is appropriate will depend on general economic considerations, industry sector considerations, and employer specific considerations. It is certainly appropriate for trustees to discuss with the employer the employer's expectations for "real" earnings growth. In addition to standard annual pay increases, this assumption will also include implicit allowance for promotional salary increases. We will seek for input from the employer on likely promotional increases over the course of an average member's career.

Past actuarial valuations and company accounting figures also provide the Trustee with an indication as to an appropriate assumption for the difference between salary growth and RPI (while remembering the need for prudence in their new assumption). The 2007 valuations assumed general earnings increases of 1.5% in excess of inflation, i.e. at 4.4% nominal. This compares with recent increases in national average earnings as follows:

Annual increase in National Average earnings % pa												
Year	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	7.6	3.8	4.6	4.5	4.4	4.4	3.2	4.2	4.1	4.3	4.5	4.2
2005	4.3	5.8	4.3	4.3	3.8	3.7	4.4	3.7	3.4	2.9	3.2	4.3
2006	3.2	5.4	4.5	3.5	4.4	5.0	3.9	3.8	4.1	4.0	3.9	3.9
2007	4.8	5.5	3.5	3.1	3.6	3.2	3.6	4.2	4.1	3.5	4.5	3.9
2008	3.8	4.0	4.6	3.5	3.1	3.4	3.5	3.2	3.2	3.5	2.5	3.1
2009	-0.7	-2.0	1.4	3.5	2.2	1.9	1.0	1.3	1.1	1.9	1.2	0.8
2010	-0.4	5.0	7.8	0.5	1.5	1.8						

Average January 2007 – June 2010: 2.8% pa, Average January 2009 – June 2010: 1.7% pa

It is noticeable that the average earnings increase is significantly lower in the last 18 months compared to the last 42 months reflecting lower pay awards being made during the recessionary period. However, over the long term it is proposed to adopt an earnings growth rate of 1.5% per annum in excess of inflation (4.5% nominal if 3.0% inflation is used), but the Trustee may consider permitting short terms deviations from this based on feedback from the employer.

To illustrate the sensitivity of this assumption, then assuming a 45 year old active member remains in service until retirement at age 65, each extra 0.1% per annum salary escalation assumed will increase the assessed value of the retirement pension for final salary benefits by 2%. The impact is larger for younger members and smaller for older members.

**Key points to consider in setting earnings growth assumption:**

- Retail Price Inflation assumption
- Company input
- Current statement of funding principles
- Previous assumptions for 'real' growth
- Prudence

## REFERENCE SHEET 5

### Revaluation of earnings and pension increases

#### Rate of revaluation of earnings

The Scheme currently increases earnings in each scheme year in line with Retail Price Index therefore the proposed assumption for revaluation of earnings is 3.0% pa. This is a different assumption from the rates adopted in the 2007 valuations (2.9%), but the change is justified due to the change in inflation assumption.

In respect of service accrued post 1 April 2011 there is a planned change to limit revaluation of earnings in each scheme year to the lower of Retail Price Index and 5%. Even if Retail Price Index averages less than 5% pa overall, it is possible that there will be some years when it exceeds 5%. So "5% LPI" increases could actually be equivalent to something less than full inflation proofing, and hence a lower assumed rate of pension increases could be justified. The proposed assumption for revaluation of earnings post 1 April 2011 is 3.0% pa for prudence.

#### Pension increases

Different tranches of scheme pension will usually be subject to one of the following provisions for increases in payment:

- No increases
- Increases at a fixed rate specified in the scheme rules
- Increases in line with RPI increases
- Increases in line with the lesser of inflation or 5% pa (i.e. "5% LPI")
- As above with a cap of 3% pa (i.e. "3% LPI") or 2.5% pa (i.e. "2.5% LPI")
- Discretionary increases

The assumptions for pension increases under the first three headings are self-evident but the assumptions for any LPI variations require slightly more consideration. Even if the relevant inflation measure (now CPI) averages less than 5% pa overall, it is possible that there will be some years when it exceeds 5%. So "5% LPI" increases could actually be equivalent to something less than full inflation proofing, and hence a lower assumed rate of pension increases could be justified. The argument for an LPI pension increase assumption being less than the full associated inflation assumption is correspondingly stronger for "3% LPI" and "2.5% LPI".

To determine the appropriate allowance below inflation, a statistical model for the distribution of future inflation returns is used. In the context of a 2.6% pa CPI inflation increase assumption, the model implies the following assumptions:

- LPI increases (5% cap) – 2.6%
- LPI increases (3% cap) – 2.2%
- LPI increases (2.5% cap) – 2.1%

***Key points to consider in setting assumptions for revaluation or pension increases:***

***- Scheme benefits***

***- Prudence***

***- Relevant inflation assumption***

***- Current statement of funding principles***

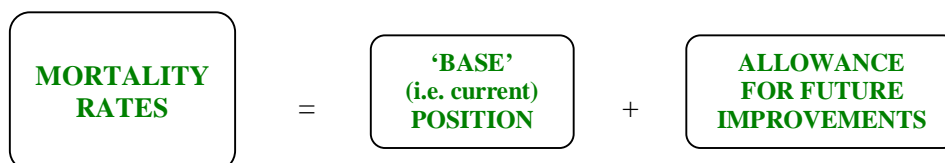
## REFERENCE SHEET 6

### Mortality

The most important demographic assumption over recent years has been mortality, and the current outlook for mortality is complex with huge amounts of research continuing to take place. In the attaching Appendix 1 you will find summarised recent research findings and other developments, with particular emphasis on the recently published Self Administered Pension Schemes (“SAPS”) tables. The Pensions Regulator has also published guidance for trustees entitled ‘Mortality assumptions: Good practice when choosing assumptions for defined benefit pension schemes’. This can be found via their website at:

<http://www.thepensionsregulator.gov.uk/guidance/guidance-mortality-assumptions.aspx>

When considering mortality rates it is considered best practice to break the assumption down into two separate parts:



The ‘base’ position can clearly be tailored to reflect the nature of the scheme and its membership profile, while the allowance for future improvements will be inherently more generic.

The Scheme Actuary last prepared an in-depth report on mortality assumptions in November 2008 for the 2008 valuations. This was considered by the Trustee (December 2008) and the Trustee decided to adopt the following general approach for the 2009 valuations after considering the Scheme Actuary’s advice:

#### Base mortality tables

- Pre retirement mortality - the new SAPS tables
- Post retirement mortality – the new SAPS tables

#### Future improvement rates

- Long Cohort assumptions with a 1% underpin
- Projections based on Year of Birth

The BASE tables adopted for the 2009 valuations is considered to remain appropriate for use in the 2010 valuations and a reminder of the rationale for these tables is included in Appendix 1. More scheme specific research can be carried out if required using externally agencies.

However, with regard to future improvements in mortality rates, the introduction of the recent CMI (‘Continuous Mortality Investigation Bureau’) mortality projections has called into question the use of the Long Cohort approach for future improvements. There is no doubt that using Long Cohort is considered prudent, but the Scheme Actuary has advised that the Trustee could still satisfy prudence requirements by adopting a form of the CMI mortality projections. More detail on these new projections is given below.

## Background on CMI Mortality Projections

The CMI has stressed the uncertainty surrounding projections of future mortality, commenting:

*“cohort effects illustrate the difficulties of projecting mortality as no-one can confidently predict whether or not they will continue into the future. In the light of this uncertainty, the CMI is saying that actuaries – and other professionals using mortality projections – must consider a range of scenarios.”*

In 2007, they released a library of mortality projections, the draft of which was accompanied by a statement from the Institute and Faculty of Actuaries:

*“All relevant recent experience confirms that mortality rates for the retired population in the UK have continued to fall rapidly, with no real signs of slowing...some projections which have been in common use may no longer be considered reasonable assumptions, even if they have been included within the library.*

*“In particular we are concerned that such an approach may not be appropriate if the underlying projection is not itself reasonable. The Interim Cohort projections, issued by the CMI in 2002, were only intended as a short-term stop-gap and assumed a fall in the rate of mortality improvement from the level experienced up to their publication. High rates of improvement have continued since that time, so that the Short Cohort and Medium Cohort projections in particular now imply a rapid tail-off in future rates of improvement in mortality and show a very different pattern from recent data published by the CMI and ONS. The extent to which the pace of improvements in mortality might be sustained in future is a matter on which there is, rightly, a range of views, both within The Actuarial Profession and in the wider community of demographers and other experts.”*

## A New Projection Model

The CMI were similarly concerned about the continuing widespread use of the (increasingly out of date) ‘interim cohort’ mortality projections, but acknowledged there was not an obvious superior alternative. They therefore set up a working party to create a new projection model, the prototype of which was released in July 2009.

This new projection model has been designed to:

- reflect the latest experience on trends in mortality
- be relatively straightforward to understand and describe
- allow users the flexibility to modify projections to suit their own views and purpose; and
- have the facility to be regularly updated over time to reflect emerging experience

This model was finalised in November 2009 and the Scheme Actuary expects that it will become the new ‘standard’ for setting future mortality improvement assumptions in pension schemes.

## Use of the new model

The first release of the new projection model is known as “CMI\_2009” and uses the latest England and Wales population mortality data available at the time from the Office of National Statistics. It incorporates rates of mortality improvement from 1991 to 2006 based on this data. (These ‘actual’ rates stop at 2006 to avoid them being unduly affected by any distortions at the ‘edge’ of the data.)

These rates can automatically be picked up from the date of your BASE table so that improvements are allowed for appropriately (e.g. if you were using the SAPS tables, then ‘actual’ improvements are allowed for from September 2002 to 2006, with projections then applying thereafter). The projection model then allows for the rates of mortality improvement appropriate for 2006 to trend to your chosen long term rate of improvement over time.

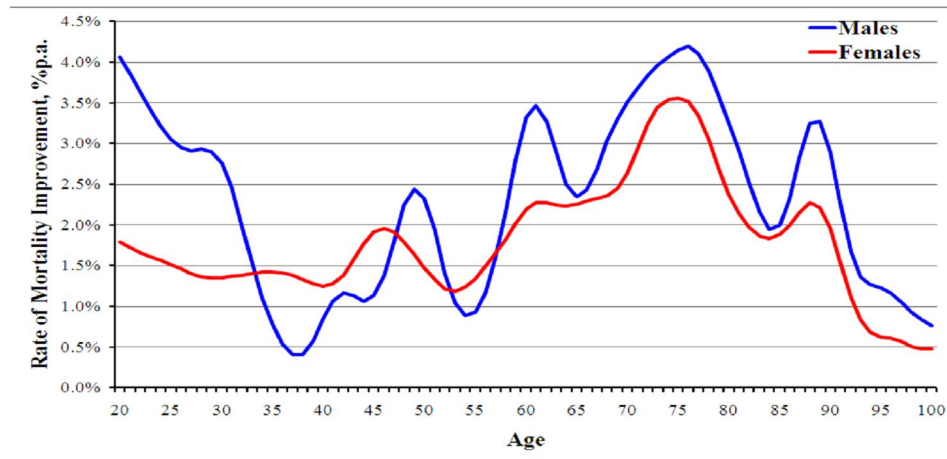
The model has both ‘core’ and ‘advanced’ versions, with the core model only requiring two parameters to be set by the Trustee, the rest of the model being populated with default values. Further refinement is then possible through the ‘advanced’ version of the model. For the core model, users need to define the long term rate of mortality improvement, and can also specify an additional level of improvement at all ages (as a level of prudence). The rates of mortality improvement then

trend from the 2006 values to the long term figure over a given period (20 years for members aged 60-80).

### Current Rates of Improvement

The current rates of improvement allowed for under the 'core' version of the CMI Projection Model have been calculated using population data for England and Wales obtained from the Office for National Statistics from 1961 to 2008. This data has been smoothed using a statistical model and is different at different ages.

The initial rates of mortality improvement for 2006 are as shown below:



(source: CMI User Guide for Projections Model)

This shows that there are clear variations, even among current pensioners of similar ages. For those of you familiar with the 'cohort effect', we have seen the generation born between 1925 and 1945 have consistently had much better survival rates than their predecessors. This much healthier group of people passing through the population could explain the larger 'hump' in the graph above. However, one would not necessarily expect these higher rates to be sustained (as once the improvement has fed through, it is hard to make a further large improvement the following year).

### Long Term Future Rates of Improvement

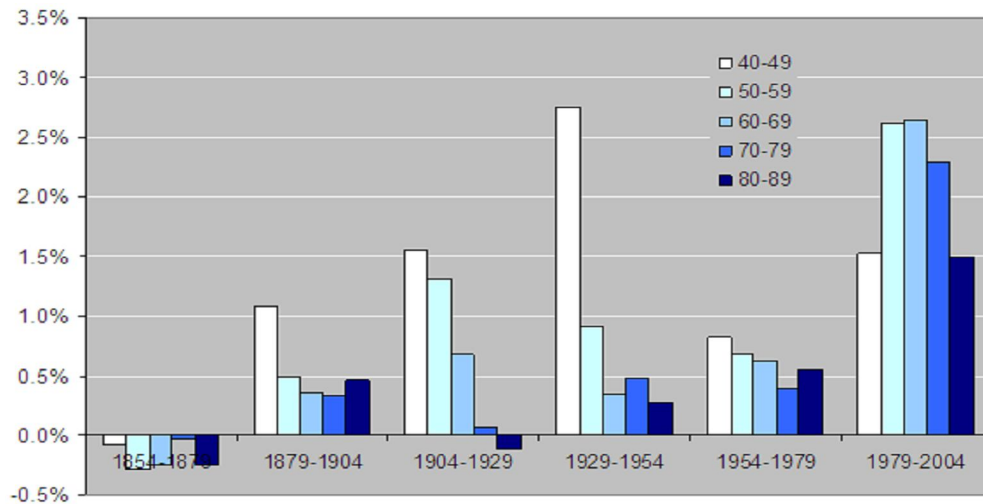
Whilst it is useful to have up to date information on rates of improvement in mortality, this information does not necessarily give us a sensible guide to a long term trend.

For example, if we had very high rates of mortality among a particular age group a few years ago, then current high rates of improvement in mortality rates may simply be bringing them into line with other ages. If this is the case, we would not have grounds to anticipate that this age group would continue to have high improvement rates in future.

In order to set a suitable long term rate of improvement, we could try and look at the sources of potential future improvement (e.g. medical advances, smoking trends etc.) but these are very hard to predict. It is therefore simpler to look at the past to give us an indication of likely future improvements, albeit noting that the causes of past and future changes in mortality rates are likely to be very different.

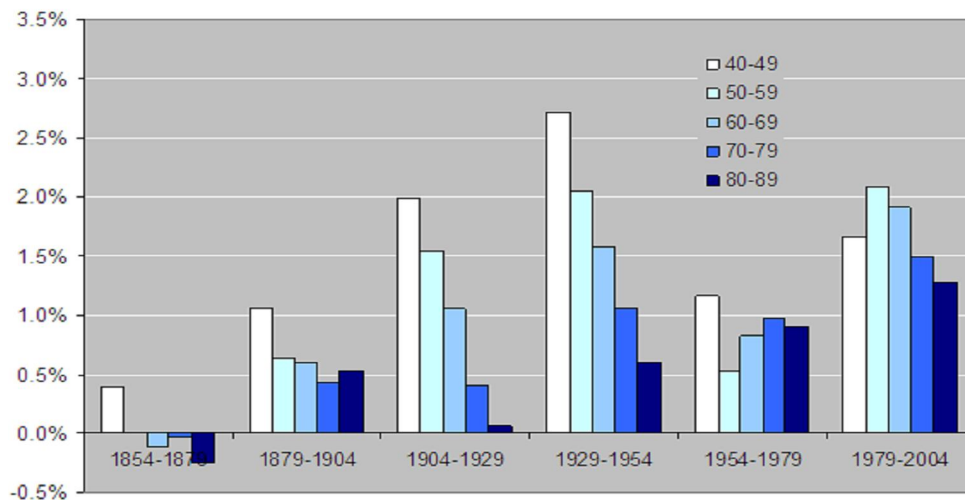
Looking at changes in the average annual rate of improvement in England and Wales over the past 150 years (in 25 year bands), gives the following information.

For males the results are as follow:



(Source: CMI Working Paper 39)

And for females, the average annual rates of mortality improvement are shown in this second graph:



(Source: CMI Working Paper 39)

Focusing on the last three bars in each group (individuals over 60), we see that improvements over the most recent twenty five years have been much higher than any previous period. Interestingly, we also note that the change in male experience has been much more pronounced (after two periods of much lower increases). However, as mentioned previously, one may expect a much higher rate to follow a very low rate (and vice versa).

Over the last 150 years, the average rate of mortality improvement (for all ages 40-89) has been 0.8% for males and 1.0% for females. It is recommended that a long-term improvement rate of no less than 1% as a prudent long term rate of mortality improvement is adopted.

- Population projections produced by the Office for National Statistics use a 1% underpin for their central projections and produce high and low variants using 2% and 0% respectively.
- The PPF is using long cohort adjusted projections with a 1.5% pa underpin for males and 1.0% pa underpin for females for its own valuation.

The following table provides an illustration of life expectancy using the mortality tables from the 2007 and 2009 valuations as well as illustrating a move to the proposed CMI projections approach for the 2010 valuations:

**Comparison of life expectancies under various mortality assumptions**

	Sex (M/F) and current age	Assumption in 2007 valuations	Assumption in 2009 valuations	Proposed CMI Projection Approach for 2010 valuations
Base Table		92 series	SAPS "Standard"	SAPS "Standard"
Projection rate method		Calendar Year (2027 for non-pensioners, 2015 for pensioners)	Year of birth	Year of birth
Projection rates		Medium Cohort	Long Cohort	CMI [2009]
Improvement Underpin		n/a	1%	n/a
Long term improvement rate		n/a	n/a	1.5% pa for males, 1.25% pa for females
Total life expectancy in years at age 65	M 45	87.4	89.5	89.5
	F 45	90.2	92.1	91.0
	M 65 pensioner	86.6	87.4	87.2
	F 65 pensioner	89.4	90.1	89.0

Adopting the CMI projections above for the 2010 valuation would reduce liabilities by about 2% to 3% depending on the liability profile of a particular scheme, relative to the 2009 assumptions. The Trustee has decided to adopt mortality assumptions in line with the SAPS "Standard" table, with a year of birth projection method and with CMI 2009 long term improvement rates of 1.5% pa for males and 1.25% pa for females as above.

<b>Key points to consider in setting mortality assumptions:</b>	
- Latest research	- Guidance from Pensions Regulator
- Advice from Scheme Actuary	- Profile of Scheme membership
- Prudent allowance for future improvements	- Current statement of funding principles

## REFERENCE SHEET 7

### Withdrawals and New Entrants

#### Withdrawals

The assumed rates of withdrawal from active service affect both the future service contribution rate and the Technical Provisions for active members. Most pension schemes are too small to analyse withdrawal rates in detail.

For schemes with CARE benefits, the withdrawal assumption is not a key factor in the calculation of the past service liabilities. However, it can be an important assumption for the calculation of the future service contribution rate if the control period used for the Projected Unit Method is more than one year.

At the 2007 and 2009 valuations, withdrawal rates illustrated by the following table were adopted.

Age	2007 (%)	2009 (%)
25	20.0	17.0
30	15.0	15.4
35	12.5	13.4
40	10.0	12.0
45	5.0	11.4
50	-	9.5
55	-	7.6
60	-	5.6

The withdrawal table was changed for the 2009 cohort of valuations based on an investigation we carried out in that year. The Trustee has decided to adopt the new withdrawal table for the 2010 valuations.

***Key points to consider in setting a withdrawal assumption:***

- *Age and liability profile of active members*
- *Employer plans*
- *Current statement of funding principles*
- *Previous assumptions*
- *Prudence*

#### New Entrants

Typically no explicit allowance is made for new entrants when setting funding assumptions.

If a pension scheme is still open to new entrants then this will have an impact on the development of the average age of active members and the total pensionable salary. However, provided that the standard contribution rate is paid for these new members and the new entrants are not significantly older than the current average, this would not typically have an adverse effect on funding.

## REFERENCE SHEET 8

### Cash Commutation and Scheme Expenses

#### Cash Commutation

The option of taking a lump sum on retirement is currently widely taken by members in practice, and current cash commutation rates are at a level where this results in surplus arising. Allowing for cash commutation in the valuation therefore recognises some of this profit in advance.

If commutation rates are changed to be (more) cost neutral, some of this profit will not in fact emerge. Such a change may occur as a result of the Trustee wanting to improve the terms for members or as a result of pressure from members, Regulators or the media.

However, the Trustee recognises that changing cash commutation rates now will increase pension amounts paid to members and, for those schemes that currently allow for cash commutation in the valuation, removing the allowance for cash commutation completely from the valuation will increase the cash contributions to the scheme for the employers.

Hence the Trustee's approach for the 2007 and 2008 valuations was, if a scheme was currently allowing for cash commutation, then it would retain the current commutation rates whilst a scheme had a deficit on the Technical Provisions basis and retain allowance in the valuation basis for members taking 3/80ths cash based on these current rates. If the funding level subsequently exceeded say 105% on the Technical Provisions basis, then the Trustee would wish to adopt cost neutral commutation rates, which would depress the funding level back to 100% (the precise rate of over-funding required will vary from scheme to scheme – 105% is a typical rate).

For the 2009 valuations the approach was changed for schemes that have a history of allowing for commutation in the assumptions. The commutation allowance, whilst producing similar valuation "gains" to the above approach was presented differently, in particular, 90% of members were assumed to commute pension for cash at maximum limits ('25% of value' rather than 3/80ths) on revised, increased commutation rates. Such an approach allows the Trustee to increase commutation rates in the future without impacting the funding requirements. The Trustee has decided to adopt this approach for the 2010 valuations.

However, the standard assumption for the 2010 valuations is that no allowance for cash commutation be taken into account for those schemes that have previously not allowed for it.

#### ***Key points to consider in setting cash commutation assumption:***

- ***Current cash commutation rates***                      - ***Value of equivalent scheme benefits***
- ***Likely changes to future commutation rates*** - ***Prudence***
- ***Proportion of pension exchanged for cash*** - ***Current statement of funding principles***

#### Scheme Expenses

Scheme expenses can be categorised broadly as follows:

- Investment management fees
- Administrative expenses
- Pension protection fund and other regulatory levies

It is assumed that investment management fees will be met directly from the assets of the scheme. In effect, therefore, the assumed rate of investment return is the rate net of investment management fees.

It is assumed that administrative expenses and regulatory levies are met by the employer by an equivalent addition to contribution payments as follows:

- for schemes still open and taking new entrants, expenses are expressed as a percentage of earnings.
- for schemes closed to new entrants expressing expenses as a percentage of (declining) total earnings will typically lead to increased % rates from valuation to valuation. An alternative mechanism, and my proposal, is to express expenses as a fixed or increasing amount per annum in £ terms. This can improve the transparency of the sources of cost and this is considered the standard approach.
- it will be necessary to include PPF premiums as an expense allowance. We will estimate future PPF premiums by assuming the same level as the levy paid for the 2010/11 period.

***Key points to consider in setting expenses assumption:***

***- Employer input***

***- Prudence***

***- Current statement of funding principles***

## REFERENCE SHEET 9

### Early Retirement and Family Statistics

#### Early Retirements

##### *Normal health*

The majority of the schemes to be valued either used to have or still do have a flexible early retirement window. This means that active members can elect to retire at any time between the ages of say 60 and 65 on an unreduced pension, at least for part of their pension. The most prudent assumption is that all active members will retire at age 60, since this will overstate the liability for any members who continue in service beyond this age.

For those schemes which have a flexible early retirement window, deferred pensioners have a pension age of 60 for service during the window. The Trustee has generally decided that, as in 2007, deferred pensioners who left service during the flexible window will retire at age 60. Those retiring after the window closed will be assumed to retire at age 65, with an appropriate late retirement factor on benefits accrued during the window.

The Trustee proposes retaining the same assumptions as used for the last valuation for the preliminary calculations but will review the actual early retirement experience.

### III-Health

The assumed rates of ill health retirement affect both the future service contribution rate and the Technical Provisions. Generally speaking, a high level of assumed ill-health retirements is more prudent than a lower rate (since on ill-health retirement the pension is paid without reduction and can include an element of prospective service). At the 2007 and 2009 valuations, ill-health retirement rates illustrated by the following table were adopted.

Age	2007 (per 1000 lives)		2009 (per 1000 lives)
	Males	Females	Unisex
30	0.2	0.2	0.1
35	0.3	0.4	0.2
40	0.5	0.8	0.3
45	1.2	1.8	0.8
50	2.8	3.6	1.8
55	5.8	10.0	3.0
60	24.0	20.0	9.5

The ill-health retirement table was changed for the 2009 cohort of valuations based on an investigation carried out in that year. The Trustee has decided to adopt the new ill-health retirement table for the 2010 valuations. As for the 2009 valuations the change in table, when considered in isolation, for a typical scheme is expected to reduce past service liabilities by 2-3%.

Allowance has been made in the 2007 and earlier valuations for accrued ill-health plus 2.5% of future benefit accrual for prospective ill-health benefits on the future service contribution rate. This was agreed to be an appropriate allowance for ill-health, given that the CARE Scheme is quite immature and full allowance either in the past service liability or as an addition to the future service contribution rate would have a disproportionate effect on the results calculated.

Since the 2007 valuation the Scheme has continued to grow and mature and although the Scheme is still relatively immature it is now felt that the impact of allowing for prospective ill health would not cause distortion in the results. As such we propose that full allowance for prospective ill health is made and spread evenly over a member's past and future pensionable service.

#### **Key points to consider in setting early retirement assumptions:**

- Assumptions at previous valuations,
- Current statement of funding principles
- Funding implications of over/underestimating experience
- Past experience
- Prudence

### Family Statistics

In the 2007 valuations it was assumed that 90% of members were married at retirement or earlier death and males were three years older than their spouse. Following an investigation the data supported a lower percentage for the proportion married. For the 2009 valuations it was assumed that 75% of members were married at retirement or earlier death. The Trustee has decided that this revised percentage is adopted for the 2010 valuations.

#### **Key considerations in setting family statistics assumptions:**

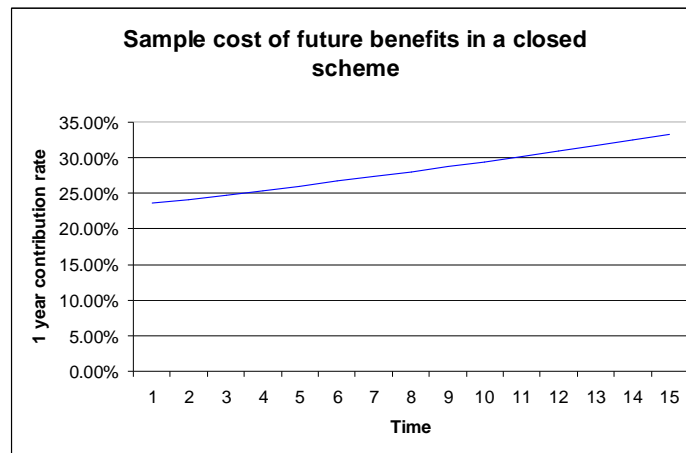
- Assumptions used at previous valuation
- Current statement of funding principles
- Materiality level

# REFERENCE SHEET 10

## Funding Methods

Sections 72-75 of the Pensions Regulator's Code of Practice on funding says trustees should choose one of four 'accrued benefit' valuation methods, as described below. However, the starting point for choosing a method for this valuation is likely to be the method adopted at the previous valuation. This is likely to have been the Projected Unit method with a suitable 'control period'.

A feature of the Projected Unit method with a control period of one year is that the future service contribution rate produced, expressed as a percentage of earnings, would be expected to remain reasonably stable from year to year provided the age and gender profile of the active members remains broadly unchanged. This method should therefore give a relatively stable future contribution rate for a scheme that has a steady flow of new entrants. However, if there is not a steady flow of new entrants, the contribution rate will tend to rise year on year as the average age of the membership rises.



Where valuations are carried out using a control period longer than one year, the method generates a level future service contribution rate over that period. This produces a higher initial rate than the one year Projected Unit method but reduces the impact of the inevitable increases that occur as the active population ages - 'overpayments' in the early years are balanced by 'underpayments' nearer retirement when the cost of benefits is higher.

By using a control period based on the term to retirement of your youngest active member then you can determine a stable rate that could (if experience matches expectations) be maintained through to this member's retirement and meet the cost of all future benefits in the scheme. Alternatively, as a compromise between these two approaches, it is possible to allow for an element of aging in your chosen control period. For example, using a three year control period would anticipate the aging of the current membership up to the next valuation date.

A more detailed overview of the four potential methods is set out overleaf.

### **Projected Unit Method (or Projected Unit Credit Method)**

The actuarial liability of active members both at the valuation date and at the end of the “Control Period” is calculated taking into account all types of decrement. In such calculations pensionable pay is projected from the relevant date up to the assumed date of retirement, date of leaving service or date of death as appropriate. The “Control Period” is the period over which the future service contribution rate has been calculated to remain constant, assuming that the funding level at the beginning and end of the period is 100 per cent. The Control Period, which is normally one year or more, should be specified.

### **Current Unit Method**

The actuarial liability for active members is calculated taking into account all types of decrement. In calculating the actuarial liability as at the valuation date, pensionable pay is not projected. In calculating it as at the end of the Control Period, pensionable pay is projected to that date. In such calculations, allowance is made for increases in the benefits between the relevant date and the assumed date of retirement, date of leaving service or date of death as appropriate. The increases to be included are those applicable to preserved pensions as required by legislation or by the rules. The Control Period, which is normally one year or more, should be specified.

### **Partly Projected Unit Method**

The actuarial liability of active members is calculated as for the Current Unit Method except that, where pensionable pay is not projected in that method, some but not full allowance is made in the Partly Projected Unit Method.

### **Defined Accrued Benefit Method**

The actuarial liability for active members both at the valuation date and at the end of the Control Period is calculated on the assumption that the scheme will be discontinued on those dates. As with the other methods, the actuarial liability is normally assessed using actuarial assumptions consistent with long term funding. It is assumed that members will be entitled to the discontinuance benefits which are defined in the rules of the scheme before reduction of benefits under the application of any priority rules in a fund with a shortfall in assets. Additionally (but not alternatively) calculations may be made which assumed that members will receive higher discontinuance benefits, by exercise of discretion, and both the actuarial liability and the future service contribution rate would then be calculated by reference to those higher benefits. The funding level, however, will always be certified by reference to the discontinuance benefits defined in the rules.

# APPENDIX 1 - MORTALITY

## Background

The topic of mortality continues to attract significant attention both from the Pensions Regulator and the media, and is a source of much uncertainty. This appendix attempts to explain some of the terminology behind mortality assumptions and provides further background information on the standard tables and recent research.

For all but the largest schemes, mortality experience is inherently volatile (due to random variations) and is unlikely to match that of standard tables (which are based on a different population). We may well recommend applying an adjustment to the standard mortality table to reflect the geographic/occupation/industry effects which we consider are likely to be relevant for each scheme, but variations in actual experience will 'feed through' over time, generating gains or losses at each valuation.

Common adjustments to the standard tables include applying multipliers to the assumed mortality rates (a multiplier over 100% reflecting an increased probability of death), or making an adjustment to the member's age (where a positive age adjustment would be used to allow for lower than 'standard' life expectancy), although there are a number of other possibilities.

Whatever the ultimate assumption, unless the Trustee has insured against longevity risks members living longer than anticipated will cause a drain on the scheme, whilst an 'early' death is likely to release a surplus into the scheme.

## The Continuous Mortality Investigation ("CMI") 92 Series Mortality Tables

The "92 series" mortality tables are based on the experience of life office annuitants (ie insurer data) between 1991-94 and include projections to allow for longevity improvements over time. These projections continue to be in common use although an adjustment to them to allow for the cohort effect (see below) was introduced in 2002.

The projections include an allowance for longevity to improve over time and so you are able to adopt a 'birth year' or 'calendar year' approach in allowing for future improvements. Most schemes now favour the 'birth year' approach which explicitly allows for different levels of future improvements for each member depending on when they were born.

### Calendar year or year of birth?

If we are using a calendar year table based on projected experience for 2009 (say), we are applying the expected experience in that year to the population as a whole and making no further allowance for longevity improvements beyond that date. To the extent that further improvements actually occur, the cost of the scheme benefits will be higher than allowed for, and (all else being equal) contributions would have to be increased. If we use a future calendar year, such as 2020, we would expect to overstate life expectancy prior to that date, but understate it in future years (as there is no allowance for further improvements).

Using a year of birth approach means that different death rates are applied to each individual, based on their year of birth and allowing for projected improvements in longevity over time. It therefore allows for younger members to benefit from further improvements in mortality (which are expected to continue), without applying these to older members. This is theoretically more accurate than a calendar year approach, but is more complex to apply and the difference in liabilities may not be material depending on the profile of scheme membership.

### The "cohort" effect

The level of improvement included in the standard 92 series projections was not as high as the level of improvement that has been seen for the generation born between 1925 and 1945. As a result, the standard projections failed to reflect the step forward in life expectancy made by this 'cohort' (which is then expected to feed through to later generations).

Three possible adjustments to the projections were therefore released in 2002 as an interim measure to try and correct for this phenomenon:

- The “short cohort” adjustments allow for the greater than anticipated improvements in longevity that have already been seen among the generation born between 1925 and 1945, but do not allow for these extra improvements to continue beyond 2010.
- If we incorporate the “medium cohort” adjustments we are allowing for the additional improvements that have already been seen from this generation and making an allowance for these to continue, tailing off in 2020.
- A “long cohort” adjustment is also possible which makes yet further allowance for additional improvements, continuing to 2040.

## The CMI “00 Series” Mortality Tables

This series of mortality tables was published in September 2005, and were formally signed off by the relevant Board of the Institute/Faculty of Actuaries during 2006. The tables most relevant are based on the experience of life office pensioners 1999-2002.

A 2004 report from the CMI highlighted the underlying mortality trends shown by 1999-2002 experience:

- “The mortality experience of life office pensioners, which traditionally has been the most important experience for pension schemes, has continued to improve significantly, being about 10% lighter than in 1995-1998 and some 20% lighter than the relevant base “92 Series” tables.”
- “The original “92 Series” projections have tended to understate the actual improvements, whereas overall the experience since 1992 has followed the medium cohort adjusted projections published in 2002 reasonably closely. However, the pattern by age is more varied, with the cohort projections tending to underestimate mortality at the younger ages and overestimate it at the older ages.”

Due to uncertainty surrounding the potential rates of future improvements, the CMI decided not to issue any projections with these revised tables. Use of the “92 series” projections therefore continued to be widespread, with many users choosing to retain the original “92 series” tables in full, possibly making an approximate adjustment to allow for the results of this later research.

## CMI Research into the Mortality Experience of Self-Administered Pension Schemes (“SAPS”)

### Overview

The first official mortality tables from this research were released on 31 October 2008. The data collected is large in relation to the life office based studies mentioned above (covering pensioner deaths from 2000 to 2006 derived from mortality experience from hundreds of pension schemes in a variety of industry sectors).

The main conclusions from the research are:

- There is evidence that the levels of mortality are higher than would be expected on the basis of the “92 Series” tables projected to the years under review. They are significantly higher than the “92 Series” allowing for the cohort effect.
- The most significant findings relate to the extent to which mortality varies with the amount of the pension in payment as the analysis revealed significantly reduced mortality for those with higher pensions.
- In particular, at some ages rates of mortality for those on higher pension may be half, or less, that of those on smaller pensions.
- Although the amounts effect can make a significant contribution towards explaining the variations in mortality that are observed between industries, it does not provide a complete explanation. This research is also providing new information on mortality rate differences between employees in different industrial sectors.

- The populations of pensioners of insured schemes and those of self-administered schemes are sufficiently heterogeneous that standard tables based on life office data need to be treated with great care when being used for self-administered schemes.

#### Further Detail on the SAPS Study

The new study has several key advantages over previous tables being used for pension scheme valuations:

- Being based on occupational pension scheme experience means it is likely to be more relevant than the previous studies based on insurance company data.
- The mortality experience studied is more recent.
- The data set is much larger than the insurance company studies, meaning the results are likely to be more reliable.

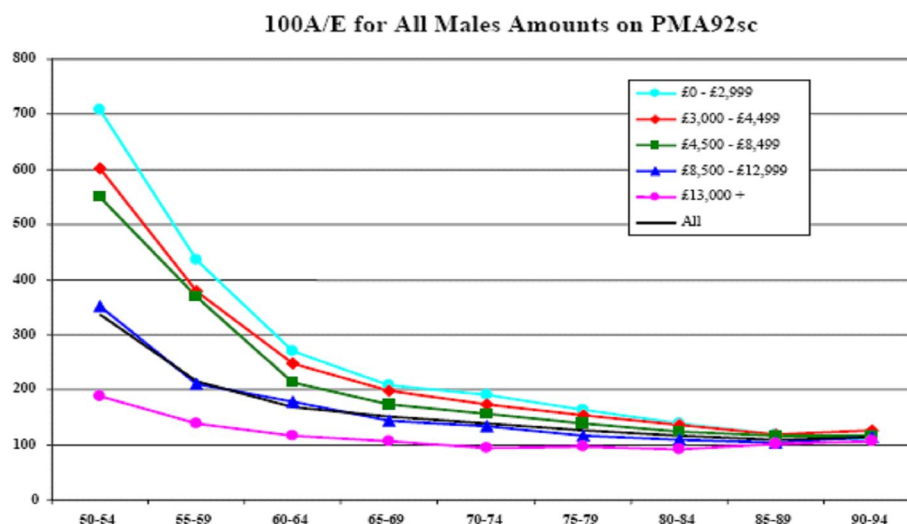
Twenty variants of SAPS tables have been produced and these are listed below:

Table Name	Data Type	Sex	Amounts/Lives	Light/Heavy
S1PFL	All pensioners (excluding dependants)	Female	Lives	-
S1PFA	All pensioners (excluding dependants)	Female	Amounts	-
S1PFA_L	All pensioners (excluding dependants)	Female	Amounts	Light
S1PFA_H	All pensioners (excluding dependants)	Female	Amounts	Heavy
S1PML	All pensioners (excluding dependants)	Male	Lives	-
S1PMA	All pensioners (excluding dependants)	Male	Amounts	-
S1PMA_L	All pensioners (excluding dependants)	Male	Amounts	Light
S1PMA_H	All pensioners (excluding dependants)	Male	Amounts	Heavy
S1DFL	Dependants	Female	Lives	-
S1DFA	Dependants	Female	Amounts	-
S1DFA_L	Dependants	Female	Amounts	Light
S1DFA_H	Dependants	Female	Amounts	Heavy
S1NFA	Normal Health pensioners	Female	Amounts	-
S1NFA_L	Normal Health pensioners	Female	Amounts	Light
S1NFA_H	Normal Health pensioners	Female	Amounts	Heavy
S1NMA	Normal Health pensioners	Male	Amounts	-
S1NMA_L	Normal Health pensioners	Male	Amounts	Light
S1NMA_H	Normal Health pensioners	Male	Amounts	Heavy
S1IIFA	Ill-health pensioners	Female	Amounts	-
S1IIMA	Ill-health pensioners	Male	Amounts	-

The 'Light' and 'Heavy' variants of the tables (right hand column) are special versions of tables derived from just looking at the experience of those pensioners with the highest and lowest pensions. These versions of the tables were produced because the SAPS study noted very different mortality rates according to the size of the pension being received.

This variation is illustrated in Table 2 below. Each line on the graph shows the number of deaths being observed compared to those expected from the adjusted "92 series" insurance company tables for a specific band of pension amount. For example a figure of 200 indicates twice as many deaths as were anticipated by the standard table.

**Table 2 – The link between pension amount and mortality rates**



It can be seen that mortality rates were much higher for members on lower pensions than for those on higher pensions, particularly at lower ages. This is because lower pensions are typically (but not always) linked to members on lower salaries and lower salaries might be linked to higher risk factors such as attitude to diet and exercise and smoking. Interestingly the impact of wealth on mortality rates diminishes significantly at older ages, particularly ages 85 and beyond.

Accordingly, in addition to the standard table, the SAPS study team decided to produce variants looking only at the experience of members with pensions above and below certain amounts. In terms of amounts, the 'cut-off' points for the SAPS Heavy and Light tables are as follows:

	Annual pension amount	
	SAPS Heavy	SAPS Light
<b>Males</b>	Less than £1500 p.a.	More than £13,000 p.a.
<b>Females</b>	Less than £750 p.a.	More than £4,750 p.a.

Note the significant difference in the cut-off points for males and females, reflecting lower average pensions for females.

**Which of the SAPS tables are appropriate for use?**

It is important to identify which of the 20 tables have a practical use. Firstly, like the PA92 tables, there are two types of tables – known as 'lives' and 'amounts' variants. The 'amounts' variants weight the mortality tables by pension amount to produce tables that reflect the fact that mortality statistics show there is a correlation between pension amounts and death rates. This is an important factor for pension schemes and we recommend the 'amounts' variants are used rather than the 'lives' tables, which results in using lower death rates and hence are more prudent.

Secondly, separate SAPS tables were produced for 'Ill health' and 'Normal health' retirements and an 'All Pensioners' table comprising both components. Given the relatively small number of ill health pensioners and the practical difficulties of identifying on what grounds a current pensioner originally retired, we suggest the 'All Pensioners (excluding dependants)' is used, and the 'Normal health' and 'Ill health' tables are not.

Separate tables were produced for female dependants, but not for male dependants. Comparisons of the mortality rates between the 'All Pensioners' tables and the 'Dependants' table show very small differences, and are certainly not material enough to merit separate use of the Dependants tables in the valuation of dependant members. Accordingly we do not consider it necessary to use these tables.

This then leaves the decision on base table as between the Standard, Light and Heavy variants. The Light and Heavy variants are subsets of the Standard Tables, representing the tails of Standard Table experience. **The Trustee, based on actuarial advice, will be adopting the SAPS "Standard" table for the 2010 valuations.**

## APPENDIX 2 - GUIDE TO RISK

### Overview

The only way to remove all risks from the trustees and sponsoring employer of a defined benefit pension scheme is to wind it up – securing all the liabilities with an insurance company. If this is not a possibility, then **it is important for trustees to understand the risk inherent in running a pension scheme.**

The next 'least risk' position would be to hold assets that will generate cash flows to match as closely as possible the cash flows out of the scheme. However, it is not possible to do this perfectly as:

- (a) there are no asset classes that will provide a 'guaranteed' return for a sufficient period to cover the expected future lifetimes of pension scheme members; and
- (b) it is not known in advance for how long these payments will be made or when they will occur.

With this in mind, the Trustee must agree on acceptable levels of risk.

### Funding Risks - General

Before looking at the assumptions to be used in an actuarial valuation, the Trustee considers the risks related to the funding of the scheme. The following are some of the key such risks.

#### Sponsor risk

Any ongoing funding objective implicitly assumes that the employer will be willing and able to continue sponsoring the scheme and to meet any deficits. The employer's covenant and the strength of the funding objective (along with the degree of risk in the investment strategy) together affect the risk that members may not receive the full benefits they expect. As a result, an essential part of understanding the scheme's funding position and ability to meet its obligations is understanding the covenant of the sponsoring employer.

It is important for the Trustee to document its assessments in this area and that it takes independent advice where appropriate.

As required by the Pensions Regulator, the Trustee should factor its assessment of the sponsoring employer's covenant into its determination of assumptions for calculating Technical Provisions. The weaker the employer covenant is assessed to be, the more prudent the assumptions should be.

The assessment of the employer covenant and impact that this has on the funding assumptions and the agreed contributions will be documented by the Trustee.

#### Data risk

A cornerstone of any actuarial valuation is the data on which it is based. If this is inaccurate or incomplete in any way then the results of the valuation may be compromised. The Scheme Actuary will summarise the data used in the calculations and highlight any areas where approximations had to be made due to inaccurate or incomplete data in our preliminary results report.

#### Regulatory risk

The Pensions Regulator has indicated that it will investigate schemes where the Technical Provisions are set at too low a level or where the recovery period is too long. The Regulator has described its approach in more detail on its website and issued periodic statements to trustees and employers advising on its views.

However, the Regulator's approach may change over time and the Regulator does ultimately have power to impose higher contributions. No allowance is made for this within the valuations as the impact of this risk cannot be quantified in advance.

## Legislative risk

There is always the risk that new legislation or court rulings could change the benefits that must be paid to members and/or the way in which they must be funded. It could also increase the costs of administering the scheme by imposing more stringent requirements.

No allowance is made for this within the valuations as the impact of this risk cannot be quantified in advance.

In particular, despite the issue being raised several times (including a government statement in January 2010), no definitive legal ruling has been made on the matter of GMP equalisation and the way in which this would need to be calculated in order to satisfy anti-discrimination laws. Therefore, unless a scheme is entering the Pension Protection Fund (where specific requirements apply), no allowance for GMP equalisation will be made within the actuarial valuation.

## Investment Related Risks

### Key investment risks

The fundamental investment risk is that the assets underperform the investment return required to meet the funding objective. There may be many different reasons for such underperformance, examples being:

- investment market risk, (i.e. investment markets can fall as well as rise, and the value of liabilities may change as a result of changes in investment markets);
- investment manager risk (i.e. individual investment manager performance is not guaranteed and may be worse than the overall market in which the manager invests).

If the assets fail to achieve the investment return required to meet the funding objective then a funding strain will result. All else being equal, additional contributions will then be required at future valuations, or benefits will need to be reduced.

As well as considering asset returns in isolation, it is important to consider whether the value of assets will move in tandem with the value placed on the liabilities. The more the scheme invests in assets that do not 'match' its liabilities, the greater the risk of volatility in the scheme's funding level (as the value of the assets may change substantially relative to the liabilities). This mismatch of assets and liabilities may come about either as a deliberate decision on the part of the trustees or because there are no assets that exactly match the target funding basis, but in either case may lead to volatility in the employer's contribution rate.

A third key point to consider is whether the funding assumptions and investment strategy are properly aligned. For example, if different discount rates are used for pensioners and non-pensioners (e.g. pre and post retirement) then in order to get 'as expected' results in three years time (all else being equal) any retirements should theoretically be matched by a reallocation of investments. In reality, excessive 'finessing' in this area is impractical given volatility in asset movements but a large number of retirements may trigger a 'rebalancing' of your portfolio.

### Other considerations

It should be noted that almost all investment managers now use derivatives for a variety of reasons, including currency hedging and to facilitate asset allocation changes. The Trustee is aware of the need to monitor and review the controls on the use of such financial instruments.

### Summary

The Trustee considers the level of investment related risks that they are running, and ensure that they are comfortable with the approach being taken. This is in both absolute terms (i.e. the risk of falls in asset values) and relative to the value placed on the scheme's liabilities (i.e. the risk that changes in the value assigned to the liabilities resulting from changes in investment markets are not reflected by similar changes in asset values).

## Non investment related risks

### Other assumptions

There is also risk (both upside and downside) for every other assumption used in the funding valuation as in reality (even on average) it is unlikely that the assumed value will prove to be exactly correct. For example, the following circumstances will normally lead to a requirement for higher than anticipated contributions:

- If members live longer than assumed.
- If inflation is above the assumed rate, and this is not offset by correspondingly higher investment returns.
- If active members receive higher pensionable salary increases than assumed.
- If pension increases are awarded at a higher rate than assumed.
- If active members leave service at lower rates or later than assumed.
- If members can exercise benefit options (e.g. on cash commutation or early/late retirement) in a way which leads to higher benefits than assumed in the valuation.

For a small scheme, there will be material risk resulting from 'random variations' as results could vary significantly from the average in a small population. In addition, these members are unlikely to have identical pensions and a few key individuals (such as former executives) could have significant cost impacts on the scheme if they live for a much longer (or shorter) period than is anticipated.