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# Financial Conduct Authority

## Periodic Review of Defined Benefit Pension Transfer Redress Guidance – Technical Manual

**JULY 2022**

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# Contents

# Introduction

# Scope

## Technical Manual

### Scope and Purpose

This Technical Manual is made by Deloitte Total Reward and Benefits Limited ("DTRB" or "us") solely for the Financial Conduct Authority ("you" or the "FCA") pursuant to terms of engagement dated 4 January 2022 and agreed by the FCA and DTRB. This Manual is the 'Technical Manual' mentioned in those agreed terms. Our work has been undertaken and this Technical Manual has been prepared so that we might state to the FCA those matters we have agreed to state to them in this Technical Manual and for no other purpose.

Without assuming or accepting any responsibility or liability in respect of this Technical Manual to any party other than the FCA, we acknowledge that the FCA may choose to make this Technical Manual publicly available for others wishing to have access to it (including consumers, financial advisers, pensions advisers, tax advisers, and other interested parties), which does not and will not affect or extend for any purpose or on any basis our responsibilities. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the FCA for our work, for this Technical Manual, or for any conclusions, opinions or proposals we have formed or made.

The FCA has asked us to perform a review of the methodology and assumptions underlying the calculations of redress for unsuitable defined benefit pension transfer advice. This includes a review of the FG 17/9 Guidance entitled "Guidance for firms on how to calculate redress for unsuitable defined benefit pension transfers".

We have therefore prepared a report: "Periodic Review of Defined Benefit Pension Transfer Redress Guidance – Technical Report" dated July 2022 ("the Report") to support the FCA in its formal review of the redress methodology. Only the areas covered in the Report have been reviewed.

We understand that this Report will be used by the FCA as a basis to form a consultation on FG 17/9 and the associated redress calculation methodology and assumptions.

Within the Report we make a number of proposals for changes to the redress methodology and assumptions for the FCA to consider. We make these proposals based on our understanding of the objectives of the FCA and the FCA's stated purpose of the redress methodology.

The FCA will retain ultimate responsibility for determining the methodology and assumptions for future redress calculations, as well as undertaking any necessary consultations with its stakeholders. In constructing the final redress methodology, we expect the FCA will need to consider a number of legal and policy decisions which are beyond the scope of the Report.

This Technical Manual has been prepared to provide worked examples of the redress calculation process for transfers under the proposed redress methodology as set out in the FCA's Consultation Paper CP22/15.

**The content of this Technical Manual is solely based on the FCA's proposed redress methodology set out in the FCA's Consultation Paper CP22/15 the contents of which may differ to the information contained in the Report.**

### Technical Actuarial and Professional Standards

This Technical Manual has been prepared in accordance with "Technical Actuarial Standard 100" (TAS 100) as issued by the Financial Reporting Council and peer reviewed in accordance with Actuarial Professional Standard X2.

# Background

## Technical Manual

### Background and Limitations

This Technical Manual has been prepared alongside the Report to provide worked examples of the redress calculation process for transfers under the proposed redress methodology as set out in the FCA's Consultation Paper CP22/15. The worked examples do not cover opt-outs, non-joiners or FSAVCs.

There are two worked examples:

1. Worked Example 1: Assumed that the consumer would not have retired in their DB scheme by the Date of Calculation.

2. Worked Example 2: Assumed that the consumer would have retired in their DB scheme by the Date of Calculation.

The examples chosen attempt to replicate some of the complexities that may be present when calculating redress for any particular consumer under the proposed redress methodology.

While it is not possible to cover every possible scenario, the two examples illustrated within this Technical Manual seek to detail a range of key aspects of redress calculations to assist with implementing the FCA's proposed changes to the redress methodology.

An overview of the two worked examples can be found on pages 7 and 8. Each case is presented as follows:

- A short summary of the case (including the benefits provided by the occupational pension scheme and the personal pension arrangement) and relevant details of the consumer in question;
- A step-by-step worked example of how the financial and demographic assumptions which the calculation is based on should be derived in line with the proposed redress methodology set out in the Consultation Paper; and
- A step-by-step worked example illustrating the process that should be used when calculating redress for this particular consumer.

Although the cases chosen illustrate realistic DB scheme benefit scenarios the actual amounts chosen are arbitrary and no particular significance should be attached to them. The purpose of the examples is to set out how the redress methodology should be applied, including assumptions setting, rather than seeking to focus on explaining how to value DB scheme benefits (which should already be understood by individuals undertaking redress calculations).

The actuarial techniques used are based on traditional annuity values and mortality and interest functions rather than a discounted cash flow method. This approach is in line with the objective of illustrating the process and does not detract from the reliability of the results.

The following general points should be noted:

- annuity factors allow for the timing of any pension increases;
- deferred benefit amounts show the pension amount at Date of Leaving;
- throughout the example calculations, some numbers have been rounded for presentational purposes (e.g. annuity factors). These are noted in the examples.
- Rounding is not undertaken at intermediate stages of the calculations (or in the intermediate stages of derivation of assumptions), however for presentational purposes figures have been rounded in this Technical Manual.

We consider that the level of detail contained in the calculations is sufficient to demonstrate how the redress methodology should be applied in these cases.

The example calculations are based on an effective **Date of Calculation ("DOC")** of **1 April 2022** with assumptions derived with reference to market conditions at 31 March 2022 (i.e. the last business day prior to the month).

# Summary of examples

# Summary of examples

## Worked Example details

### Worked Example 1

This is an example of a married man, whose wife's age is unknown, who left service in a contracted out DB scheme on 1 January 2020 and transferred his pension to a personal pension on 31 December 2021.

The individual is currently aged 54.1 (at 1 April 2022) and has not yet accessed any benefits in their personal pension.

Under the occupational DB scheme, he would have had the right to retire at age 65 with no reduction for early retirement and without requiring employer consent.

Up to retirement age, the Excess over the GMP would have increased (revalued) in line with the Consumer Prices Index as at the previous September capped at 5% p.a. over the whole period. The GMP would have increased at a Fixed rate of 3.50% p.a. over the period.

At retirement, the Excess over GMP would have increased on 1 April each year in line with the Consumer Prices Index as at the previous January capped at 5% p.a. for pension accrued prior to 1 April 2009, and capped at 2.5% p.a. for pension accrued post 1 April 2009. The post 88 GMP would have increased in line with statutory increases (i.e. CPI capped at 3% p.a.)

A dependant's pension of 50% of the member's pension (revalued to date of death) would have been payable on death before or after retirement (pre commutation).

This example illustrates:

- How to derive financial assumptions for cases where it is assumed that the consumer would not have retired in their DB scheme by the Date of Calculation; and
- How to increase redress from Date of Calculation to Settlement Date.

# Summary of examples

## Worked Example details

### Worked Example 2

This is an example of a single woman, who left service in a contracted out DB scheme on 8 January 2010 and transferred her pension to a personal pension on 31 December 2016.

Under the occupational DB scheme, part of the individual's benefits were payable unreduced from age 60 with the other part of her benefits payable unreduced from age 65. Up to retirement age, her pension would have increased (revalued) in line with the Retail Prices Index as at the previous September capped at 5% p.a. over the whole period.

At retirement, the pension would have increased on 1 April each year in line with the Retail Prices Index as at the previous January capped at 5% p.a. for pension accrued prior to 1 April 2009, and capped at 2.5% p.a. for pension accrued post 1 April 2009.

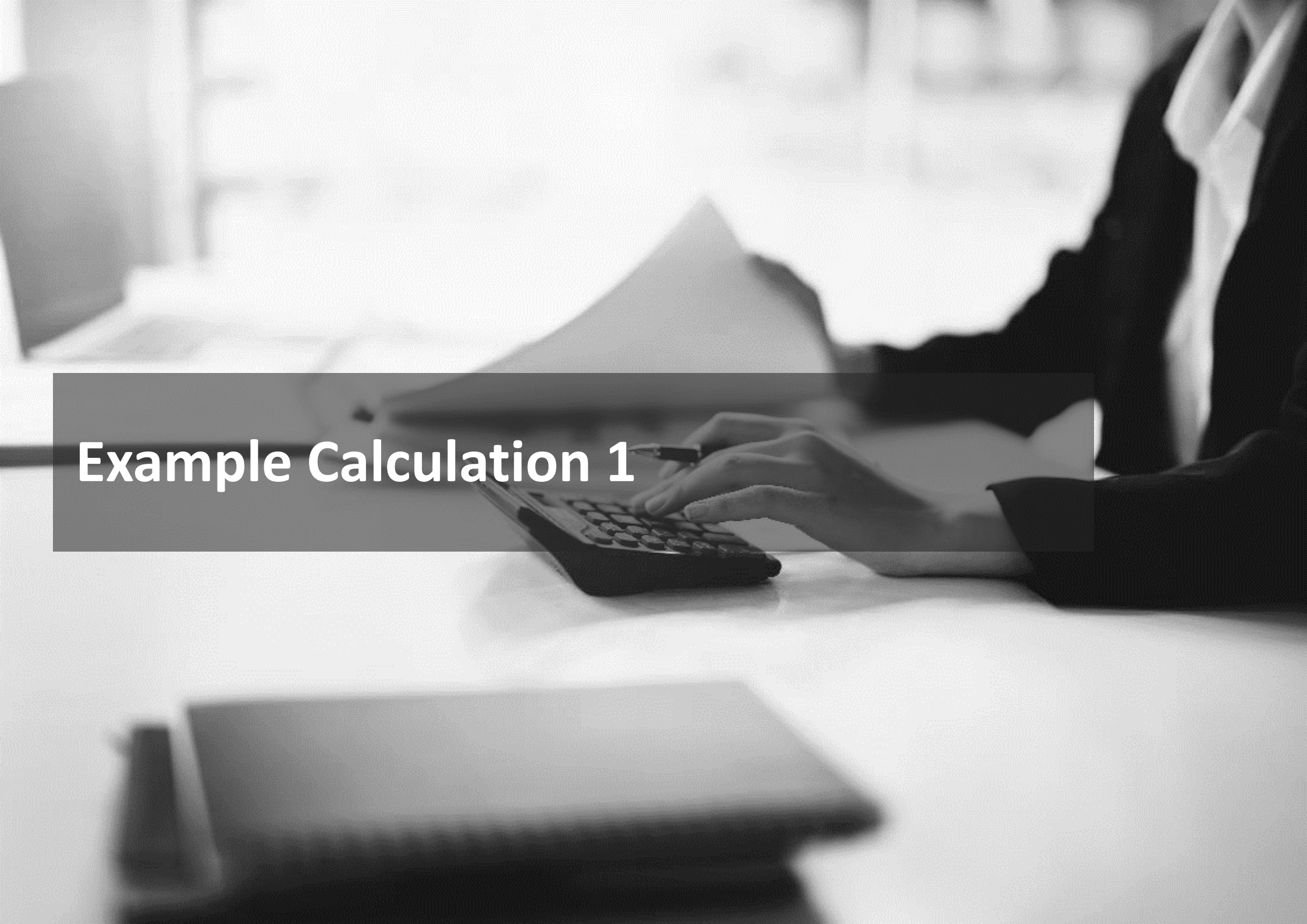
The individual is currently aged 62.9 (at 1 April 2022).

**Two different scenarios in respect of the method of accessing benefits from her personal pension are considered.**

- **Scenario A:** On her 60th birthday (1 May 2019), she took the maximum pension commencement lump sum and entered a drawdown arrangement with the remaining funds, making regular withdrawals.
- **Scenario B:** On her 60th birthday (1 May 2019), she took the maximum pension commencement lump sum from her personal pension and purchased a single life non-increasing annuity with the remaining funds.

This example illustrates:

- How to derive financial assumptions for cases where it is assumed that the consumer would have retired in their DB scheme by the Date of Calculation;
- How to allow for tranches of pension in the occupational DB scheme with different retirement ages;
- How to allow for personal pension benefits which have already been taken by the consumer, and DB scheme benefits which the consumer would have received by the Date of Calculation; and
- How to allow for the consumer taking a pension commencement lump sum, using DB scheme specific PCLS and Early Retirement Factors.



# Example Calculation 1

# Example Calculation 1

## Calculation Practicalities

### Proposed approach

Calculation Date: The date of calculation should be the first business day of the month (for calculations undertaken within the month).

Redress calculations must be based on the new assumptions from the first business day of each new month, using publicly available data based on the final business day of the month just ended.

**Retirement Age:** The earliest age at which the consumer could have retired from the DB Pension Scheme without both:

- Requiring the consent of the employer; and
- Suffering a reduction in benefits

Where a consumer has benefits payable from different ages, the redress calculation should reflect the most favourable option for the consumer.

**Interest on redress:** Interest should be applied to the redress amount calculated for the period from Date of Calculation to date of settlement.

For cases where it is assumed that the consumer would not have retired in their DB scheme by the Date of Calculation, interest should be applied in line with the pre-retirement discount rate assumption (with an adjustment for charges)

### Approach used in redress calculation for Consumer 1

**Calculation Date:** The Date of Calculation ("DOC") is 01/04/2022. Therefore market conditions as at 31/03/2022 are used to derive the assumptions for the redress calculation.

**Retirement Age:** The earliest age at which the consumer can take his benefits unreduced in the DB scheme is age 65 (for all tranches of pension) without requiring the consent of the employer. Therefore the assumed retirement age is age 65.

**Interest on redress:** The redress Settlement Date is 30/08/2022. Based on this, the redress calculated as at the Date of Calculation is increased in line with the pre-retirement discount rate assumption (with an adjustment for charges) from Date of Calculation to redress Settlement Date.

**Data :** The derivation of the financial assumptions used in this calculation are based on the following data sources:

- **Bank of England yield curves:** https://www.bankofengland.co.uk/statistics/yield-curves ('UK instantaneous nominal forward curve (gilts)' and 'UK instantaneous implied inflation forward curve (gilts)')
- **FTSE All-Share Index:** https://www.londonstockexchange.com/indices/ftse-all-share

# Example Calculation 1

## Background

This is an example of a male who left service in a contracted out DB pension scheme in 2020 and transferred in 2021 to a personal pension policy. The individual is aged 54 at Date of Calculation (01/04/2022) and has therefore not yet accessed any benefits. The DB scheme still exists.

### Personal details

- **Sex:** Male
- **Date of Birth ("DOB"):** 17/02/1968
- **Marital Status:** Married
- **Date of Leaving Service in DB scheme ("DOL"):** 01/01/2020
- **GMP age ("GMPA"):** 65 (17/02/2033)
- **State Pension Age ("SPA"):** 67 (17/02/2035)
- **Spouse's Date of Birth:** Unknown

### Personal pension benefits

- **Fund Value at DOC:** £400,000
- **Annual Management Charges:** 1.0% p.a.
- **Ongoing adviser charges:** 0.5% p.a.
- **Redress Settlement Date:** 30/08/2022

### DB scheme details

- **Scheme Normal Retirement Age ("NRA"):** 65 – giving **Normal Retirement Date ("NRD"):** 17/02/2033
- **Spouse's Pension:**
  - **Proportion on death in payment:** 50% of the pre-commuted pension with a 5 year guarantee.
  - **Proportion on death in deferment:** 50% of the pension revalued to date of death.
- **Pension increases in deferment and payment:** In line with table below. Revaluation is based on September inflation. Pension increases are applied annually on 1 April, based on January inflation, with a full increase awarded on the first 1 April after retirement. No past practice of discretionary increases.

| Pension Tranche | Revaluation in Deferment | Pension Increases in Payment |
|---|---|---|
| Pre 88 GMP | Fixed rate | Nil |
| Post 88 GMP | Fixed rate | Statutory CPI (0,3)[1] |
| Pre 97 Excess | CPI (max 5%) [2] | CPI (0,5) |
| Post 97 Pension | CPI (max 5%) [2] | CPI (0,5) |
| Post 09 Pension | CPI (max 5%) [2] | CPI (0,2.5) |

[1] Notation: CPI (0,3) is used to represent CPI with a minimum of 0% p.a. and a maximum of 3% p.a., other rates are displayed equivalently.

[2] Revaluation is provided in line with the "Higher" revaluation percentage set out in the appropriate Occupational Pensions (Revaluation) Order – also known as 'Schedule 3 Higher'

- **Benefits at DOL:**
  - **Post 88 GMP:** £100.00 p.a.
  - **Pre 97 Excess:** £3,500.00 p.a.
  - **Post 97 Pension:** £5,911.30 p.a.
  - **Post 09 Pension:** £5,288.70 p.a.
  - **Total: £14,800 p.a.**

# Example Calculation 1

## Derivation of assumptions – Pre-retirement Inflation

### Pre-retirement RPI:

***Proposed approach to deriving assumption***

Based on the 'UK instantaneous implied inflation forward curve (gilts)' published by the Bank of England to 40 years.

For terms greater than 40 years, the 40 years rate should be used.

For terms shorter than that published, the next available rate should be adopted. This includes the use of the 2.5 year term rates rather than 'stepping over' this to the 3 year rate.

Pre-retirement – take the spot rate for the term to retirement (specifically, the number of integer years to retirement). A deduction of 0.2% should be made for an Inflation Risk Premium.

The final assumptions should then be rounded to the nearest 0.05%. Note, where the RPI rate is used in the derivation of other assumptions (including CPI, pension increases and pre-retirement discount rate, the unrounded RPI rate should be used).

### Derivation of assumption

The Consumer is aged 54.1 years at Date of Calculation. The Consumer has a retirement age of 65. Therefore the Term to Retirement is: 65 – 54.1 = c.10.9 years

The integer term to retirement is: 10 years

The 'UK implied inflation spot curve' data published by the Bank of England (part of the 'UK instantaneous implied inflation forward curve (gilts)' data) at the effective date of the assumptions (31/03/2022: the last business day prior to the month) states:

| Term | Spot Rate |
|---|---|
| **10** | **4.27%** |

Spot Rate – Inflation Risk Premium = 4.27% - 0.2% = **4.07%**

**Pre-retirement RPI** = 4.07% rounded to the nearest 0.05% = **4.05%**

# Example Calculation 1

## Derivation of assumptions – Pre-retirement Inflation

### Pre-retirement CPI:

***Proposed approach to deriving assumption***

- For calculations with a date of calculations in year 20YY
- For a consumer with term to retirement of x years where 0< a ≤ x < b (with a and b the integer values either side of x)

RPI - CPI gap for pre-retirement inflation:

**If 20YY + a ≤ 2030: 1%**

$$\boldsymbol{Else} = \frac{[\mathbf{1}\% \times (\mathbf{2030} - \mathbf{20YY})] + \mathbf{0.5}\%}{\boldsymbol{a}}$$

The (unrounded) RPI - CPI gap for pre-retirement inflation should be applied to the relevant unrounded RPI rate. The final CPI assumption should then be rounded to the nearest 0.05% at the end.

### Derivation of assumption

For this Consumer:

- The effective date (01/04/2022) is in 2022; and
- The term to retirement is c.10.9 years, so a = 10 and b = 11

Applying the above test, 2022 + 10 = 2032, which is greater than 2030, meaning the wedge is calculated using the formula approach.

$$Wedge = \frac{1\% \; x \; (2030 - 2022) + 0.5\%}{10} = \mathbf{0.85}\%$$

Therefore, deducting this wedge from the unrounded pre-retirement RPI assumption gives:

Unrounded pre-retirement RPI assumption – Wedge = 4.07% - 0.85% = **3.22%**

**Pre-retirement CPI** = 3.22% rounded to the nearest 0.05% = **3.20%**

# Example Calculation 1

## Derivation of assumptions – Post-retirement Inflation

### Post-retirement RPI:

***Proposed approach to deriving assumption***

The discounted mean term is dependent on the assumed retirement age as follows:

| Assumed retirement age | 55 | 60 | 65 | 70 | 75 |
|---|---|---|---|---|---|
| **DMT** | 23 | 20 | 16 | 13 | 11 |

Discounted mean terms for other assumed retirement ages should be based on linear interpolation and rounded to the nearest integer.

Based on the 'UK instantaneous implied inflation forward curve (gilts)' published by the Bank of England to 40 years.

For terms greater than 40 years, the 40 years rate should be used.

For terms shorter than that published, the next available rate should be adopted. This includes the use of the 2.5 year term rates rather than 'stepping over' this to the 3 year rate.

Post-retirement – take the derived forward rates from normal retirement age to the age indicated after adding on the discounted mean term, using the same methodology as stated in relation to the post-retirement discount rate.

The final assumptions should then be rounded to the nearest 0.05%. Note, where the RPI rate is used in the derivation of other assumptions (including CPI, pension increases and pre-retirement discount rate, the unrounded RPI rate should be used).

### Derivation of assumption

The Consumer has an assumed retirement age of 65.

| Assumed retirement age | 55 | 60 | 65 | 70 | 75 |
|---|---|---|---|---|---|
| **DMT** | 23 | 20 | 16 | 13 | 11 |

The Discounted Mean Term (DMT) is therefore 16 years.

Based on a term to retirement of 10 years and DMT of 16 years, spot rates from the UK instantaneous implied inflation spot curve are used to derive a 16 year forward rate which applies in 10 years time.

The 'UK implied inflation spot curve' data published by the Bank of England at the effective date of the assumptions (31/03/2022: the last business day prior to the month) states:

| Term | Spot Rate |
|---|---|
| **10** | **4.27%** |
| **26** | **3.77%** |

The derived forward rate is calculated as follows:

$$\frac{(1 + 3.77\%)^{(10+16)}}{(1 + 4.27\%)^{(10)}} = \mathbf{1.723}$$

This result is then raised to the power of (1 divided by the DMT) and 1 is subtracted.

$$(1.723)^{1/16} - 1 = \mathbf{3.46\%}$$

**Post-retirement RPI** = 3.46% rounded to the nearest 0.05% = **3.45%**

# Example Calculation 1

## Derivation of assumptions – Post-retirement Inflation & Pension Increases

### Post-retirement CPI:

***Proposed approach to deriving assumption***

- For calculations with an effective date in year 20YY
- For a consumer with term to retirement of x years where a ≤ x < b (with a and b the integer values either side of x)
- For a consumer retiring at an age with an associated DMT = d

RPI - CPI gap for post-retirement inflation (pension increases):

**If 20YY + a > 2030 = 0%**

$$\boldsymbol{Else} = \frac{[\mathbf{1}\% \times (\mathbf{2030} - \mathbf{20YY} - \boldsymbol{a})] + \mathbf{0.5}\%}{\boldsymbol{d}}$$

The (unrounded) RPI - CPI gap for post-retirement inflation should be applied to the relevant unrounded RPI rate. The final CPI assumption should then be rounded to the nearest 0.05% at the end.

### Derivation of assumption

For this consumer:

- The effective date (01/04/2022) is in 2022;
- The term to retirement is c10.9 years, so a = 10 and b = 11; and
- The consumer is assumed to retire at age 65, which has a DMT of 16 (d = 16).

Applying the above test, 2022 + 10 = 2032, which is greater than 2030, meaning the wedge is **0%**.

Therefore, deducting this wedge from the unrounded post-retirement RPI assumption gives:

**Post-retirement CPI** = 3.46% rounded to the nearest 0.05% = **3.45%**

### Pension increases in payment:

***Proposed approach to deriving assumption***

This is defined as the relevant pension increase assumption together with the either the RPI or CPI assumption (depending on the benefits of the relevant DB Scheme).

- If the scheme imposes a cap or a floor: The pension increase assumption should be derived using a standard Black's model with an inflation volatility of 1.0%. The final assumption should be rounded to the nearest 0.05%.
- If the scheme grants fixed increases in payment, then those fixed rates should be used.

### Derivation of assumption

The consumer has pension increases in payment of CPI capped at 3%, 5% and 2.5% for various different tranches.

The pension increase in payment assumptions are calculated in line with the Black's model, using the unrounded post-retirement CPI assumption of 3.46% and the appropriate caps. An example of how the pension increases are derived is set out in the Appendix.

- **Pension Increases: CPI (0,5): 3.45% p.a.**
- **Pension Increases: CPI (0,3): 2.80% p.a.**
- **Pension Increases: CPI (0,2.5): 2.40% p.a.**

# Example Calculation 1

## Derivation of assumptions – Pre-retirement Discount Rate

### Pre-retirement discount rate:

***Proposed approach to deriving assumption***

The pre-retirement discount rate is derived as one half of the expected return on equities. The expected return on equity for the period to retirement is:

**(1 + CPI spot inflation) x (1 + average dividend yield) x (1 + growth in dividends) – 1**

Where:

- The CPI spot inflation rate is based on the unrounded CPI inflation assumption.
- Average dividend yield = The arithmetic average of the dividend yield on the FTSE All Share Index of the last business day over the last twelve month ends.
- Growth in dividends = Fixed 1% p.a.

The final assumptions should then be rounded to the nearest 0.05%.

### Derivation of assumption

From page 13, the unrounded pre-retirement CPI inflation assumption is **3.22%**.

Based on a calculation date of 01/04/2022, the dividend yields on the FTSE All Share Index on the last business day over the last twelve month ends are as follows.

| Date | FTSE All Share Index Dividend Yield | Date | FTSE All Share Index Dividend Yield |
|---|---|---|---|
| 31/03/2022 | 3.11% | 30/09/2021 | 3.14% |
| 28/02/2022 | 3.04% | 31/08/2021 | 2.98% |
| 31/01/2022 | 2.98% | 30/07/2021 | 2.81% |
| 31/12/2021 | 3.09% | 30/06/2021 | 2.80% |
| 30/11/2021 | 3.20% | 28/05/2021 | 2.77% |
| 29/10/2021 | 3.11% | 30/04/2021 | 2.83% |

The arithmetic average of these dividend yields is as follows:

$$\frac{(3.11 + 3.04 + 2.98 + 3.09 + 3.20 + 3.11 + 3.14 + 2.98 + 2.81 + 2.80 + 2.77 + 2.83)}{12}$$

$$= \mathbf{2.988}\%$$

Growth in dividends is fixed at 1% p.a.

Substituting these values into the expected return on equity formula opposite:

(1 + 3.22%) x (1 + 2.988%) x (1 + 1%) – 1 = **7.367%**

Multiplying this return by 0.5 to achieve one half of the expected return gives:

7.368% x 0.5 = 3.684%

**Pre-retirement Discount Rate** = 3.684% rounded to the nearest 0.05% = **3.70%**

# Example Calculation 1

## Derivation of assumptions – Post-retirement Discount Rate

### Post-retirement discount rate:

***Proposed approach to deriving assumption***

The initial post-retirement discount rate is calculated by:

- Taking the spot rate on the nominal gilt liability curve using a term equal to the sum of the integer term to retirement and the discounted mean term, adding 1, and raising to the power of the sum of the period to retirement and the discounted mean term; divided by
- Taking the spot rate on the nominal gilt liability curve using a term equal to the sum of the integer term to retirement, adding 1, and raising to the power of the term to retirement; then
- Raising the result to the power of (1 divided by the discounted mean term), subtracting 1 and round to the nearest 0.05%; then
- Deducting 0.6% to allow for the margins built into annuity pricing.

An adjustment is also made to the post-retirement discount rate assumption to allow for the option for the consumer to take a pension commencement lump sum.

The final rate adjusts for the pension commencement lump sum by taking:

- 75% of the initial post-retirement discount rate, plus
- 25% of the initial post-retirement discount rate plus 1.6%.

This may be modified to reflect additional to pension income in the original scheme.

### Derivation of assumption

Based on a term to retirement of 10 years and DMT of 16 years (see page 14), spot rates from the 'UK nominal gilt spot curve' are used to derive a 16 year forward rate which applies in 10 years time.

The 'UK nominal gilt spot curve' data published by the Bank of England at the effective date of the assumptions (31/03/2022) states:

| Term | Spot Rate |
|---|---|
| **10** | **1.63%** |
| **26** | **1.81%** |

The derived forward rate is calculated as follows:

$$\frac{(1+1.81\%)^{(10+16)}}{(1+1.63\%)^{(10)}} = \mathbf{1.356}$$

This result is then raised to the power of (1 divided by the DMT) and 1 is subtracted.

$$(1.356)^{1/16} - 1 \ = \mathbf{1.92\%}$$

This is then rounded to the nearest 0.05% = **1.90%**

A deduction of 0.60% is then applied to allow for the margins in annuity pricing:

**Initial post-retirement discount rate** = 1.90% - 0.60% = **1.30%**

Finally, an adjustment of 1.60% is applied to 25% of the initial post-retirement discount rate to allow for the PCLS:

**Post-retirement discount rate** = 75% x 1.30% + 25% x (1.30% + 1.60%) = **1.70%**

# Example Calculation 1

## Derivation of assumptions – Charges (adjustment to pre-retirement discount rate)

### Charges:

***Proposed approach to deriving assumption***

**Overall approach**: Allowance for charges should be made by 'netting down' the pre-retirement discount rate. This would be undertaken as follows:

- Pre-retirement discount rate (unadjusted for charges): i% p.a.
- Charges: c% p.a.

**Pre-retirement discount rate (adjusted for charges): (1 + i %) x (1 – c %) - 1**

**Product Charges:** The assumed personal pension charges of 0.75% p.a. should be 'netted off' the pre-retirement discount rate.

**Ongoing Adviser Charges:** The assumed regular adviser charges of 0.50% p.a. should be 'netted off' from the pre-retirement discount rate.

### Derivation of assumption

The consumer incurs an annual management charge of 1.00% p.a., and ongoing adviser charges of 0.50% p.a.

An allowance is made in the calculation for a reasonable level of product and adviser charges. These are assumed to be 0.75% p.a. and 0.50% p.a. respectively.

This means an adjustment needs to be made to the pre-retirement discount rate assumption to allow for these assumed charges.

**Pre-retirement discount rate** (adjusted for charges)
= (1 + 3.70%) × (1 − (0.75% + 0.50%)) **– 1 = 2.404%**

The unrounded figure should be used.

# Example Calculation 1

## Derivation of assumptions – Demographic and Other assumptions

### Demographic:

***Proposed approach to deriving assumption***

**Mortality**

Base Table – 100% of the PxA16 tables, published by the Institute & Faculty of Actuaries (IFoA) Continuous Mortality Investigation, assuming male and female mortality in equal parts.

Future Improvements – Calculated using male and female annual CMI Mortality Projections Models in the series CMI (20YY-2)_M_[1.25%] and CMI (20YY-2)_F_[1.25%] in equal parts for the year commencing 1 April 20YY.

**Spouse/ Civil Partner's Age Difference**

The actual age of a consumer's spouse/ civil partner should be requested and used where possible, otherwise the spouse/ civil partner should be considered to be the same age as the consumer.

### Other assumptions:

***Proposed approach to deriving assumption***

**GMP equalisation:** No allowance.

**SERPS adjustment:** No SERPS adjustment for consumers who reached SPA after 06/04/2016 and who transferred after 06/04/2016.

### Derivation of assumption

Based on the effective date of the assumptions (within the year commencing 1 April 2022), the mortality assumptions to be used in the calculation are:

**Base Table** – 100% of the PxA16 tables (assuming male and female mortality in equal parts)

**Future Improvements** – Calculated using CMI 2020_M_[1.25%] and CMI 2020_F_[1.25%] in equal parts

The spouse's date of birth is not known, therefore the spouse is considered to be the same age as the consumer.

No allowance is made in respect of GMP equalisation.

The consumer will reach SPA on 17/02/2035 and transferred on 31/12/2019. As these are both after 06/04/2016, no SERPS adjustment is required.

# Example Calculation 1

## Derivation of assumptions – Proportion married or in a civil partnership at retirement

### Proportion married or in a civil partnership at retirement

***Proposed approach to deriving assumption***

For cases where it is assumed that the consumer would not have retired in their DB scheme by the Date of Calculation, the table below should be used for the proportion married/in a civil partnership based on the actual status of the consumer at Date of Calculation.

| Term to retirement | Married/In civil partnership | Not married/Not in civil partnership |
|---|---|---|
| 0 | 100% | 0% |
| 5 | 95% | 10% |
| 10 | 90% | 20% |
| 15 | 85% | 30% |
| 20 | 80% | 40% |
| 25 | 75% | 45% |
| 30 | 70% | 50% |
| 35 | 70% | 55% |
| 40 | 70% | 55% |

Rates should be interpolated for other terms and rounded to the nearest 1%. No adjustment should be applied for mortality of the spouse/partner before application.

### Derivation of assumption

The Consumer is aged 54.1 at the DOC. The term to retirement is: 65 – 54.1 = 10.9 years.

The proportion married or in a civil partnership at retirement assumption should be interpolated based on the table to the left:

$$90\% + [(85\% - 90\%) \times \frac{(10.9 - 10)}{(15 - 10)}] = \mathbf{89.1\%}$$

The percentage is then rounded to the nearest 1%.

**Proportion married or in a civil partnership at retirement : 89%**

# Example Calculation 1

## Summary of assumptions

| | |
|---|---|
| Pre-retirement Discount Rate (unadjusted for charges) | 3.70% p.a. |
| Pre-retirement Discount Rate (adjusted for charges) | 2.404% p.a. |
| Post-retirement Discount Rate (adjusted for annuity pricing and PCLS) | 1.70% p.a. |
| Pre-retirement RPI | 4.05% p.a. |
| Post-retirement RPI | 3.45% p.a. |
| Pre-retirement CPI | 3.20% p.a. |
| Post-retirement CPI | 3.45% p.a. |
| Pension increases<br>- CPI (0,5)<br>- CPI (0,3)<br>- CPI (0,2.5) | <br>3.45% p.a.<br>2.80% p.a.<br>2.40% p.a. |
| Mortality | 100% of the PxA16 tables, published by the Institute & Faculty of Actuaries (IFoA) Continuous Mortality Investigation, assuming male and female mortality in equal parts. |
| Future Improvements | Calculated using male and female annual CMI Mortality Projections Models in the series CMI 2020_M_[1.25%] and CMI 2020_F_[1.25%] in equal parts |
| Proportion married or in a civil partnership at retirement | 89% |
| GMP equalisation | No allowance |
| SERPS adjustment | None |

# Example Calculation 1

## Redress calculation

### 1. Value placed on DB benefits

The first part of the redress calculation is to place a value on the DB scheme benefits the consumer could have received if they had not transferred out.

#### 1a. DB pension at Date of Leaving (DOL)

The pension at DOL for this consumer is as follows:

- Post 88 GMP[1] – £100.00 p.a.
- Pre 97 Excess – £3,500.00 p.a.
- Post 97 Pension – £5,911.30 p.a.
- Post 09 Pension – £5,288.70 p.a.
- **Total: £14,800 p.a.**

#### 1b. DB pension at Date of Retirement (DOR)

The DB pension is revalued from DOL to DOR in line with the revaluation in deferment approach used by the DB scheme.

- *GMP revaluation*
  - There are 12 complete tax years between the Consumer's DOL and their DOR (which is also their GMP age).
  - Based on a DOL of 01/01/2020, the GMP receives fixed rate revaluation of 3.50% p.a.
  - Therefore the Post 88 GMP at DOR is:

    £100.00 x $1.035^{12}$ = £151.11 p.a.

- *Excess revaluation*
  - There were 2 complete years between the DOL and DOC, and 13 complete years between DOL and DOR.
  - Revaluation for 2 years (based on published September CPI values) from DOL to DOC is 3.60%.
  - There are then 11 remaining revaluations between DOC and DOR.
  - Total revaluation over the period is less than the cap so there is no impact of the cap.
  - Therefore, the individual elements at DOR are:

    Pre 97 XS: £3,500.00 x 1.036 x $1.032^{11}$ = £5,127.49 p.a.

    Post 97: £5,911.30 x 1.036 x $1.032^{11}$ = £8,660.03 p.a.

    Post 09: £5,288.70 x 1.036 x $1.032^{11}$ = £7,747.92 p.a.

The total pension at DOR is therefore **£21,686.55 p.a.**

#### 1c. Value of DB pension at DOR

A value then needs to be placed on the future DB pension payments that would have been made from DOR. This is done using annuity factors.

Annuity factors at DOR are then calculated based on:

- Post-retirement mortality assumptions set out on page 19;
- Pension increases as set out on page 15;
- The post-retirement discount rate as set out on page 17;

The annuity factors allow for a reversionary spouse's pension (of 50% of the Consumer's pre commuted pension), a 5 year guarantee, a proportion married assumption of 89% and that the pension is payable monthly).

[1] Note: adjustments to GMP to provide a viable 'weekly' amount have been ignored in this example for presentational ease

# Example Calculation 1

## Redress calculation

- The annuity factors for each tranche are set out below (rounded to two decimal places for presentational purposes, unrounded factors are used in the calculation):
  - Post 88 GMP: 30.91
  - Pre 97 XS: 34.13
  - Post 97: 34.13
  - Post 09: 29.11

The value of the DB pension at DOR is therefore:

£151.11 x 30.91 + £5,127.49 x 34.13 + £8,660.03 x 34.13 + £7,747.92 x 29.11

= **£700,846.96** *(using unrounded annuity factors)*

### 1d. Value of DB pension at DOC

The value of the DB pension at DOR is then discounted back to DOC using

- the pre-retirement discount rate assumption (after the adjustment for assumed charges) of 2.404% p.a.,
- the unrounded period from DOC to DOR of 10.877… years, and
- allowing for the probability that the consumer survives until DOR (probability derived using the post-retirement mortality assumptions) of 95.326%.

£700,846.96 x $1.02404^{-10.877..}$ x 0.95326 = **£515,964.72**

Allowance is also made for the death before retirement benefits the Consumer's dependants would receive if the Consumer died before retirement (allowing for the probability of this using the post-retirement mortality assumptions).

The capitalised values of the dependant's pension arising on death before retirement is calculated by summation of single life annuity values with relevant mortality and discount factors applied.

- The individual pension elements at DOC are:
  - Post 88 GMP: £100.00 x $1.035^2$ = £107.12 p.a.
  - Pre 97 XS: £3,500.00 x 1.036 = £3,626.00 p.a.
  - Post 97: £5,911.30 x 1.036 = £6,124.11 p.a.
  - Post 09: £5,288.70 x 1.036 = £5,479.09 p.a.
- The capitalised value of dependants death before retirement pension at DOC, allowing for a dependants pension of 50% and the 89% proportion married or in a civil partnership assumption.
  - Post 88 GMP: £107.12 x 0.5 x 0.89 x 1.61* = £76.53
  - Pre 97 XS: £3,626.00 x 0.5 x 0.89 x 1.85* = £2,989.30
  - Post 97: £6,124.11 x 0.5 x 0.89 x 1.85* = £5,048.76
  - Post 09: £5,479.09 x 0.5 x 0.89 x 1.47* = £3,590.60

**This represents the capitalised value of widow's pension using the relevant mortality and discount rate assumptions.*

In total this is: **£11,705.19** *(using unrounded annuity factors)*

Together with the value of the DB pension at DOC this is a total of **£527,669.91**

# Example Calculation 1

## Redress calculation

### 2. Value of personal pension

The next part of the redress calculation considers the value at the DOC of the consumer's personal pension policy.

The consumer has not accessed their benefits since transferring, and so the value of the personal pension at the DOC is used in the calculation.

The value of the personal pension at DOC is £400,000.

### 3. Redress value at DOC

The redress value at DOC is therefore:

Value of DB benefits at DOC: £527,669.91

*less*

Value of personal pension at DOC: £400,000.00

**Redress at DOC: £127,669.91**

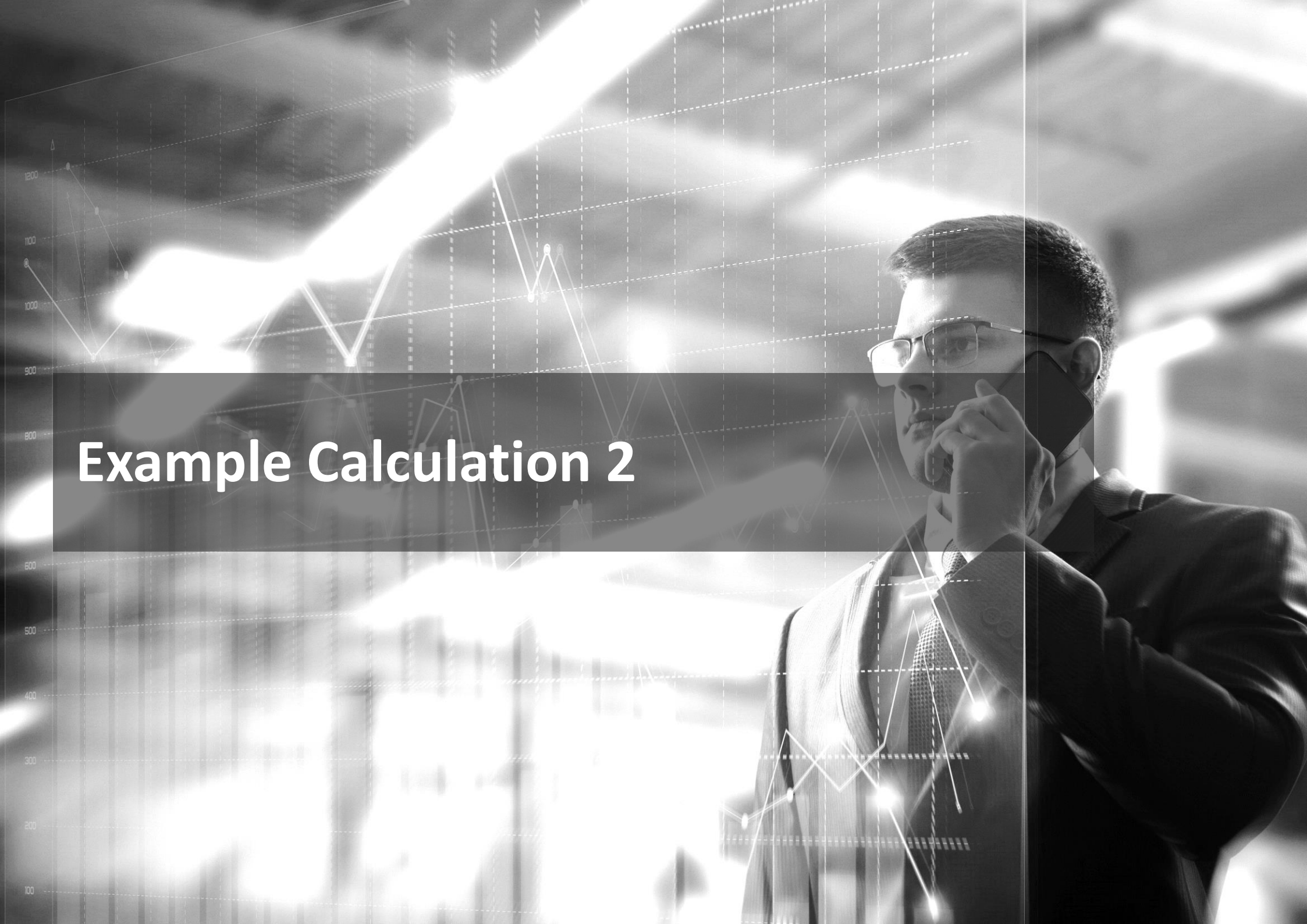
### 4. Redress value at Settlement Date

The consumer accepts the redress amount offered and the redress is due to be paid on 30/08/2022. This is 151 days after the DOC.

- The redress value at DOC needs to be increased in line with the pre-retirement discount rate assumption (with an adjustment for charges) from DOC to Settlement Date.
- Therefore the redress paid to the consumer is:

£127,669.91 x $1.02404^{151/365}$ = **£128,930.67***

**The redress amount shown above is gross of taxation. The redress will need to allow for any tax implications of the redress payment and the potential impact the redress payment will have on any means-tested benefits the consumer may be entitled to. This is outside the scope of this Technical Manual.*



# Example Calculation 2

# Example Calculation 2

## Calculation Practicalities

### Proposed approach

Calculation Date: The date of calculation should be the first business day of the month (for calculations undertaken within the month).

Redress calculations must be based on the new assumptions from the first business day of each new month, using publicly available data based on the final business day of the month just ended.

**Retirement Age:** The age which it is assumed that the consumer would have retired in their DB scheme (prior to the Date of Calculation).

**Interest on redress:** Interest should be applied to the redress amount calculated for the period from Date of Calculation to date of settlement.

- For cases where it is assumed that the consumer would not have retired in their DB scheme by the assumed Date of Calculation: interest should be applied in line with the pre-retirement discount rate assumption (with no adjustment for charges)
- For cases where it is assumed that the consumer would have retired in their DB scheme by the assumed Date of Calculation: interest should be applied in line with the post-retirement discount rate assumption (with no adjustment for annuity pricing nor PCLS)

**Past Payments (Past Loss):** Past payments (both relating to the DB scheme and the DC scheme) should be increased from date of payment to Date of Calculation in line with Bank of England Base Rate over the period.

### Approach used in redress calculation for Consumer 2

**Calculation Date:** The Date of Calculation ("DOC") is 01/04/2022. Therefore market conditions as at 31/03/2022 are used to derive the assumptions for the redress calculation.

**Retirement Age:** For the purpose of this worked example it is assumed that the consumer would have retired at age 60 in the DB scheme.

**Interest on redress:** The redress Settlement Date is 05/07/2022. Based on this, the redress calculated as at the Date of Calculation is increased in line with the post-retirement discount rate assumption from DOC to redress Settlement Date.

**Past Payments (Past Loss):** As the consumer has accessed benefits since 01/05/2019 (i.e. before the DOC), the past payments (both relating to the DB scheme and the DC benefits) will need to be increased from date of payment to DOC in line with Bank of England Base Rate.

**Data :** The derivation of the financial assumptions used in this calculation are based on the following data sources:

- **Bank of England yield curves:** https://www.bankofengland.co.uk/statistics/yield-curves ('UK instantaneous nominal forward curve (gilts)' and 'UK instantaneous implied inflation forward curve (gilts)')
- **FTSE All-Share Index:** https://www.londonstockexchange.com/indices/ftse-all-share

# Example Calculation 2

## Background

This is an example of a single female who left service in 2010 and transferred the value to a personal pension policy from a contracted out occupational scheme over six years later. The DB scheme still exists and the individual is currently aged 62.

*Scenario A: The individual went into a drawdown arrangement.*
*Scenario B: The individual purchased an annuity.*

### Personal details

- **Sex:** Female
- **Date of Birth ("DOB"):** 01/05/1959
- **Marital Status:** Single
- **Date of Leaving Service in DB scheme ("DOL"):** 08/01/2010
- **GMP age ("GMPA"):** 60 (01/05/2019)
- **State Pension Age ("SPA"):** 66 (01/05/2025)

### Personal pension benefits

- **Date of Transfer out of DB scheme:** 31/12/2016
- **Date entering drawdown/ annuity purchased:** 01/05/2019
- **Fund value as at 01/05/2019:** £160,000: From this a Pension commencement lump sum taken was taken of £40,000 (i.e. maximum available PCLS)

### Scenario A: Drawdown

- **Drawdown from 01/05/19 to Date of Calculation:** £5,000 p.a. (non-increasing, withdrawn in equal monthly instalments)
- **Fund value at Date of Calculation**: £118,000

### Scenario B: Annuity Purchase

- **Amount:** £5,000 p.a.
- **Increases:** Nil
- **Spouse's Pension – Proportion on Death:** None
- **Guarantee Period:** None

### DB scheme details

- **Normal Retirement Date ("NRD"):** 01/05/2024
- **Scheme Normal Retirement Age ("NRA"):** Varies by tranche – 60 for Post 97 Pension, 65 for Post 09 Pension.
- **Spouse's Pension - Proportion on Death:** 2/3rds with a 5 year guarantee.
- **Pension increases payment:** In line with table below. Revaluation is based on September inflation. Pension increases are applied annually on 1 April, based on January inflation. There is no past practice of discretionary increases.

| Pension Tranche | Revaluation in Deferment | Pension Increases in Payment |
|---|---|---|
| Post 97 Pension | RPI (max 5%) | RPI (0,5) |
| Post 09 Pension | RPI (max 5%) | RPI (0,2.5) |

- **DB Scheme PCLS factors in force at 01/05/2019:** 22:1 for Post 97 Pension, 18:1 for Post 09 Pension at age 60.
- **DB Scheme Early retirement factor in force at 01/05/2019:** 6% p.a. applied on a compound basis to the pension revalued to early retirement date.
- **Benefits at DOL:**
  - **Post 97 Pension:** £3,834.78 p.a.
  - **Post 09 Pension:** £365.22 p.a.
  - **Total: £4,200 p.a.**

# Example Calculation 2

## Derivation of assumptions – Inflation

### Post-retirement RPI:

***Proposed approach to deriving assumption***

The discounted mean term is dependent on the assumed retirement age as follows:

| Assumed retirement age | 55 | 60 | 65 | 70 | 75 |
|---|---|---|---|---|---|
| DMT | 23 | 20 | 16 | 13 | 11 |

Discounted mean terms for other assumed retirement ages should be based on linear interpolation and rounded to the nearest integer.

Based on the 'UK instantaneous implied inflation forward curve (gilts)' published by the Bank of England to 40 years.

For terms greater than 40 years, the 40 years rate should be used.

For terms shorter than that published, the next available rate should be adopted. This includes the use of the 2.5 year term rates rather than 'stepping over' this to the 3 year rate.

Post-retirement – take the derived forward rates from normal retirement age to the age indicated after adding on the discounted mean term, using the same methodology as stated in relation to the post-retirement discount rate.

The final assumptions should then be rounded to the nearest 0.05%. Note, where the RPI rate is used in the derivation of other assumptions (including CPI, pension increases and pre-retirement discount rate, the unrounded RPI rate should be used).

### Derivation of assumption

At the DOC, it is assumed that the consumer would have already retired from the DB scheme. As such, to derive the post-retirement discount rate assumption, the DMT that should be used will depend on their age at DOC.

The Consumer is aged 62.92 years at Date of Calculation.

| Assumed retirement age | 55 | 60 | 65 | 70 | 75 |
|---|---|---|---|---|---|
| DMT | 23 | 20 | 16 | 13 | 11 |

Using linear interpolation on the DMT's provided in the Guidance, the DMT to use for this consumer is:

$$20 - \frac{(62.92-60)}{(65-60)} \times (20-16) = 17.66 = 18 \text{ (rounded to the nearest integer)}$$

The 'UK implied inflation spot curve' data published by the Bank of England at the effective date of the assumptions (31/03/2022) states:

| Term | Spot Rate |
|---|---|
| **18** | **4.06%** |

Based on a DMT of 18 years, the spot rate from the above curve is **4.06%**.

**Post-retirement RPI** = 4.06% rounded to the nearest 0.05% = <u>4.05%</u>

# Example Calculation 2

## Derivation of assumptions – Inflation & Pension Increases

### Post-retirement CPI:

***Proposed approach to deriving assumption***

- For calculations with an effective date in year 20YY
- For a consumer with term to retirement of x years where a ≤ x < b (with a and b the integer values either side of x)
- For a consumer retiring at an age with an associated DMT = d

RPI - CPI gap for post-retirement inflation:

**If 20YY + a > 2030 = 0%**

$$\boldsymbol{Else} = \frac{[\mathbf{1}\% \times (\mathbf{2030} - \mathbf{20YY} - \boldsymbol{a})] + \mathbf{0.5}\%}{\boldsymbol{d}}$$

The (unrounded) RPI - CPI gap for pre-retirement inflation should be applied to the relevant unrounded RPI rate. The final CPI assumption should then be rounded to the nearest 0.05% at the end.

### Derivation of assumption

For this consumer:

- The effective date is in 2022;
- The term to retirement is 0 years, so a = 0 and b = 1; and
- The DMT is 18 (d = 18).

Applying the test above, 2022 + 0 = 2022, which is less than 2030, meaning the wedge is calculated using the formula approach.

$$Wedge = \frac{1\%\ x\ (2030 - 2022\ - 0) + 0.5\%}{18} = \mathbf{0.472}\%$$

Therefore, deducting this wedge from the unrounded post-retirement RPI assumption gives:

Unrounded post-retirement RPI assumption – Wedge = 4.06% - 0.472% = **3.588%**

**Post-retirement CPI** = 3.588% rounded to the nearest 0.05% = **3.60%**

### Pension increases in payment:

***Proposed approach to deriving assumption***

This is defined as the relevant pension increase assumption together with the either the RPI or CPI assumption (depending on the benefits of the relevant DB Scheme).

- If the scheme imposes a cap or a floor: The pension increase assumption should be derived using a standard Black's model with an inflation volatility of 1.0%. The final assumption should be rounded to the nearest 0.05%.
- If the scheme grants fixed increases in payment, then those fixed rates should be used.

### Derivation of assumption

The consumer has pension increases in payment of RPI capped at 5% and RPI capped at 2.5% for two different tranches.

The pension increase in payment assumptions are calculated in line with Black's model, using the unrounded post-retirement RPI assumption of 4.06% and the appropriate caps.

An example of how the pension increases are derived is set out in the Appendix.

- **Pension Increases: RPI (0,5): 3.95% p.a.**
- **Pension Increases: RPI (0,2.5): 2.45% p.a.**

# Example Calculation 2

## Derivation of assumptions – Post-retirement Discount Rate

### Post-retirement discount rate:

***Proposed approach to deriving assumption***

The initial post-retirement discount rate is calculated by:

- Taking the spot rate on the nominal gilt liability curve using a term equal to the sum of the integer term to retirement and the discounted mean term, adding 1, and raising to the power of the sum of the period to retirement and the discounted mean term; divided by
- Taking the spot rate on the nominal gilt liability curve using a term equal to the sum of the integer term to retirement, adding 1, and raising to the power of the term to retirement; then
- Raising the result to the power of (1 divided by the discounted mean term), subtracting 1 and round to the nearest 0.05%; then
- Deducting 0.6% to allow for the margins built into annuity pricing.

An adjustment is also made to the post-retirement discount rate assumption to allow for the option for the consumer to take a pension commencement lump sum.

The final rate adjusts for the pension commencement lump sum by taking:

- 75% of the initial post-retirement discount rate, plus
- 25% of the initial post-retirement discount rate plus 1.6%.

This may be modified to reflect actual pension commencement lump sum percentages for cases where it is assumed that the consumer would have retired in their DB scheme by the assumed Date of Calculation or where the pension commencement lump sum was additional to pension income in the original scheme.

### Derivation of assumption

The 'UK nominal gilt spot curve' data published by the Bank of England at the effective date of the assumptions (31/03/2022) states:

| Term | Spot Rate |
|---|---|
| **18** | **1.85%** |

Based on a DMT of 18 years, the spot rate is **1.85%**.

The assumption is then rounded to the nearest 0.05% = **1.85%**

A deduction of 0.60% is then applied to allow for the margins in annuity pricing:

**Initial post-retirement discount rate** = 1.85% - 0.60% = **1.25%**

The actual PCLS factors used by the DB scheme are known, as is the amount of cash taken by the consumer when they purchased the annuity. As such, no adjustment is made to the post-retirement discount rate for a PCLS.

**Post-retirement discount rate = 1.25%**

# Example Calculation 2

## Derivation of assumptions – Demographic & Other assumptions

### Demographic:

***Proposed approach to deriving assumption***

**Mortality**

Base Table – 100% of the PxA16 tables, published by the Institute & Faculty of Actuaries (IFoA) Continuous Mortality Investigation, assuming male and female mortality in equal parts.

Future Improvements – Calculated using male and female annual CMI Mortality Projections Models in the series CMI (20YY-2)_M_[1.25%] and CMI (20YY-2)_F_[1.25%] in equal parts for the year commencing 1 April 20YY.

**Spouse/ Civil Partner's Age Difference**

The actual age of a consumer's spouse/ civil partner should be requested and used where possible, otherwise the spouse/ civil partner should be considered to be the same age as the consumer.

**Proportion married or in a civil partnership at retirement**

For cases where it is assumed that the consumer would have retired in their DB scheme by the Date of Calculation, the actual status at Date of Calculation should be used, if known.

### Derivation of assumption

Based on the DOC (within the year commencing 1 April 2022), the mortality assumptions to be used in the calculation are:

**Base Table -** 100% of the PxA16 tables (assuming male and female mortality in equal parts)

**Future Improvements** – Calculated using CMI 2020_M_[1.25%] and CMI 2020_F_[1.25%] in equal parts

The consumer is single, so no allowance is made for any spouse benefits.

### Other assumptions:

***Proposed approach to deriving assumption***

**GMP equalisation:** No allowance.

**SERPS adjustment:** No SERPS adjustment for consumers who reached SPA after 06/04/2016 and who transferred after 06/04/2016.

### Derivation of assumptions

No allowance is made in respect of GMP equalisation.

The consumer will reach SPA on 01/05/2025 and transferred on 31/12/2016. As these are both after 06/04/2016, no SERPS adjustment is required.

# Example Calculation 2

## Summary of assumptions

| | |
|---|---|
| Post-retirement Discount Rate | 1.25% |
| Post-retirement RPI | 4.05% |
| Post-retirement CPI | 3.60% |
| Pension increases<br>- RPI (0,5)<br>- RPI (0,2.5) | <br>3.95% p.a.<br>2.45% p.a. |
| Mortality | 100% of the PxA16 tables, published by the Institute & Faculty of Actuaries (IFoA) Continuous Mortality Investigation, assuming male and female mortality in equal parts. |
| Future Improvements | Calculated using male and female annual CMI Mortality Projections Models in the series CMI 2020_M_[1.25%] and CMI 2020_F_[1.25%] in equal parts |
| GMP equalisation | No allowance |
| SERPS adjustment | None |

# Example Calculation 2

## Redress calculation

### 1. Value placed on future DB benefits

The first part of the redress calculation is to place a value on the future DB scheme benefits the consumer could have received if they had not transferred out.

**1a. DB pension at Date of Leaving (DOL)**

The pension at DOL for this consumer is as follows:

- **Post 97 Pension – £3,834.78 p.a.**
- **Post 09 Pension - £365.22 p.a.**
- **Total: £4,200 p.a.**

**1b. DB pension at Date of Retirement (DOR)**

The DB pension is revalued from DOL to DOR in line with the revaluation in deferment approach used by the DB scheme.

- *Pension revaluation*
  - There were 9 complete years between the Consumer's DOL and assumed DOR.
  - Revaluation for 9 years (based on published September RPI values) from DOL to DOR is 32.00%.
  - Therefore, the individual pension elements at DOR are:

    Post 97: £3,834.78 x 1.32 = £5,061.91 p.a.

    Post 09: £365.22 x 1.32 = £482.09 p.a.
- *Early retirement reduction*
  - At the assumed date of Retirement (01/05/2019), the DB scheme adopted early retirement factors of 6% p.a. compound applied to the pension revalued to the Consumer's early retirement date.
  - The normal retirement age for the Post 97 tranche is 60, and therefore no reduction applies to this tranche. The normal retirement age for the Post 09 tranche is 65, and so a 5 year early retirement reduction applies.
  - For the Post 09 tranche, as the consumer is retiring 5 years early, the early retirement factor that applies is $(1\text{-}0.06)^5 = 0.7339$
  - Therefore, the individual pension elements post early retirement reduction at assumed date of Retirement (01/05/2019) are:

    Post 97: £5,061.91

    Post 09: £482.09 x 0.7339 = £353.81
  - The total pension at DOR (before cash commutation) is £5,415.72 p.a.
- *Pension commencement lump sum (PCLS)*
  - The Consumer took the maximum PCLS available from their DC fund at retirement. It is assumed that the consumer would have commuted the maximum PCLS at retirement from the DB scheme.

# Example Calculation 2

## Redress calculation

Using the cash commutation factors set out on page 27 as in force in the DB scheme at the assumed date of retirement, the maximum PCLS the consumer can commute from each tranche, and the residual pension remaining is as follows:

| Tranche | Pre commutation pension (£ p.a.) | Maximum PCLS per tranche | Post commutation pension (£ p.a.) |
|---|---|---|---|
| Post 97 | £5,061.91 | £25,898.14 | £3,884.72 |
| Post 09 | £353.81 | £1,721.21 | £258.19 |
| **Total** | **£5,415.72** | **£27,619.35** | **£4,142.91** |

***1c. DB pension at Date of Calculation (DOC)***

The pension is then increased to allow for pension increases that would have been awarded from 01/05/2019 to 01/04/2022, in April 2020, 2021 and 2022 based on actual January RPI, subject to the relevant cap.

- After applying pension increases, the pension at DOC is:

  Post 97: £4,247.76 p.a.

  Post 09: £275.16 p.a.

**1d. Value of DB pension at DOC : Future Benefits**

A value then needs to be placed on the future DB pension payments that would have been payable from DOC. This is done using annuity factors.

Annuity factors at DOC can be calculated based on:

  - The Consumer's age at DOC (62.92)
  - Post-retirement mortality assumptions set out on page 31;
  - Pension increases as set out on page 29; and
  - The post-retirement discount rate as derived on page 30.

- The annuity factors are single life annuities (as the member is single) and assumes the pension is payable monthly.
- The annuity factors for each tranche are set out below (rounded to two decimal places for presentational purposes, unrounded factors are used in the calculation):
  - Post 97: 36.83
  - Post 09: 29.47
- The value at DOC is therefore:

  £4,247.76 x 36.83 + £275.16 x 29.47 = £164,545.31 *(using unrounded annuity factors)*

**2. Value of past DB benefits: Past Benefits**

The next part of the redress calculation considers the value at the DOC of the historic DB pension payments (and PCLS) the consumer would have been entitled to if they had remained a member of the DB scheme.

- The historic pension payments (including PCLS of £27,619.35) are each individually revalued from date of payment to DOC in line with the Bank of England base rate over the period.
- The sum of these revalued payments results in a total past DB value of £40,289.49.

Therefore, the total DB value at DOC (past + future) = **£204,834.80**

# Example Calculation 2

## Redress calculation: Scenario A – Drawdown

### Scenario A
### 3. Value of past personal pension benefits: Past Benefits

The next part of the redress calculation considers the value at the DOC of the benefits the consumer has already received from their personal pension.

- At the consumer's DOR, their DC fund had a value of £160,000.
- The member took the maximum PCLS upon retirement (£40,000) and entered drawdown (the drawdowns taken by the individual up to Date of Calculation are set out on page 27).
- The historic drawdown payments (including PCLS of £40,000) are each revalued to DOC in line with the Bank of England base rate.
- This results in a total past DC value of £55,013.40

### Scenario A
### 4. Value of future personal pension benefits: Current Fund Value

The next part of the redress calculation considers the value at the DOC of the Consumer's personal pension policy.

The value of the personal pension at DOC is £118,000

Therefore, the total DC value at DOC (past + future) = **£173,013.40.**

### Scenario A
### 5. Redress value at DOC

The redress value at DOC is therefore:

Value of DB benefits at DOC (past & future): £204,834.80

*less*

Value of personal pension at DOC (past & future): £173,013.40

**Redress at DOC: £31,811.40**

### Scenario A
### 6. Redress value at Settlement Date

The consumer accepts the redress amount offered and the redress is due to be paid on 05/07/2022. This is 95 days after the DOC.

- The redress value at DOC needs to be increased in line with the post-retirement discount rate assumption (with no adjustment for annuity pricing nor PCLS) from DOC to redress Settlement Date.
- Therefore the redress paid to the consumer is:

£31,811.40 x $1.0185^{95/365}$ = **£31,963.54***

**The redress amount shown above is gross of taxation. The redress will need to allow for the tax implications of the redress payment and the potential impact the redress payment will have on any means-tested benefits the consumer may be entitled to. This is outside the scope of this Technical Manual.*

# Example Calculation 2

## Redress calculation: Scenario B – Annuity Purchase

### Scenario B
### 3. Value of past personal pension benefits: Past Benefits

The next part of the redress calculation considers the value at the DOC of the benefits the consumer has already received from their personal pension.

- At the consumer's DOR, their DC fund had a value of £160,000.
- The member took the maximum PCLS upon retirement (£40,000) and purchased an annuity with the remainder of the funds (the terms of the annuity are set out on page 27).
- The historic annuity payments (including PCLS of £40,000) are each revalued to DOC in line with the Bank of England base rate.
- This results in a total past DC value of £55,013.40

### Scenario B
### 4. Value of future personal pension benefits: Future Benefits

The next part of the redress calculation considers the value at the DOC of the future benefits the consumer will receive from their personal pension.

An annuity factor can be calculated to value the future annuity payments. This annuity is calculated using:

- The Consumer's age at DOC (62.92)
- Post-retirement mortality assumptions set out on page 31;
- Nil pension increases, in line with the terms of the annuity purchased; and
- The post-retirement discount rate as derived on page 30.
  - The annuity factor calculated is 21.17 rounded to two decimal places for presentational purposes, unrounded factors are used in the calculation):.
  - The future annuity value is therefore £5,000 x 21.17 = £105,867.96

Therefore, the total DC value at DOC (past + future) = **£160,881.36.**

### Scenario B
### 5. Redress value at DOC

The redress value at DOC is therefore:

Value of DB benefits at DOC (past & future): £204,834.80

*less*

Value of personal pension at DOC (past & future): **£160,881.36**

**Redress at DOC: £43,953.44**

### Scenario B
### 6. Redress value at Settlement Date

The consumer accepts the redress amount offered and the redress is due to be paid on 05/07/2022. This is 95 days after the DOC.

- The redress value at DOC needs to be increased in line with the post-retirement discount rate assumption (with no adjustment for annuity pricing nor PCLS) from DOC to redress Settlement Date.
- Therefore the redress paid to the consumer is:

£43,953.44 x $1.0185^{95/365}$ = **£44,163.65***

**The redress amount shown above is gross of taxation. The redress will need to allow for the tax implications of the redress payment and the potential impact the redress payment will have on any means-tested benefits the consumer may be entitled to. This is outside the scope of this Technical Manual.*

# Appendix

# Pension Increases in Payment – Black's Model

Under this model, it is assumed that the underlying rate is distributed log-normally with a volatility $\sigma$.

The overall equation and components used within the calculation to derive the assumption are detailed below.

For pensions increases subject to a Minimum ("Floor") and Maximum ("Cap"), the pension increase assumption for a set Inflation Assumption is calculated as follows:

> ***Pension Increase Assumption*** = $Floor + Call\ Price\ (Floor) - Call\ Price\ (Cap)$

Where:

$\boldsymbol{Stock\ Price}\ (\boldsymbol{S}) = 1 + Inflation\ Assumption$

$\boldsymbol{Strike\ Price}\ (\boldsymbol{K}) = 1 + Floor \quad or \quad 1 + Cap$

$\boldsymbol{Volatility} = \sigma$ = 1.0%

$$\boldsymbol{d_1} = \frac{ln\left(\frac{S}{K}\right) + \left(\frac{\sigma^2}{2}\right)}{\sigma}$$

$\boldsymbol{d_2} = d_1 - \sigma$

$\boldsymbol{N} = Cumulative\ Standard\ Normal\ Distribution\ Table$

$\boldsymbol{Call\ Price}\ (\boldsymbol{C}) = SN(d_1) - KN(d_2)$

These values are taken from the Cumulative Standard Normal Distribution Table

# Pension Increases in Payment – Black's Model – Example for Consumer 1

Set out below is an example for calculating the CPI(0,2.5) pension increase assumption using the Black Scholes approach for Consumer 1. Other pension increases for Consumer 1 and Consumer 2 are derived in a similar way.

| | |
|---|---|
| Inflation Assumption (unrounded) | 3.46% |
| Minimum = Floor | 0.00% |
| Maximum = Cap | 2.50% |
| Volatility ($\sigma$) | 1.00% |

| | Floor | Cap |
|---|---|---|
| 1 + Inflation (S) | (1 + 0.0346) = 1.0346 | (1 + 0.0346) = 1.0346 |
| Strike Price (K) | (1 + 0.00) = 1.00 | (1 + 0.025) = 1.025 |
| $d_1$ | $\frac{\ln\left(\frac{1.0346}{1.00}\right)+\left(\frac{(0.01)^2}{2}\right)}{0.01}$ = 3.40415 | $\frac{\ln\left(\frac{1.0346}{1.025}\right)+\left(\frac{(0.01)^2}{2}\right)}{0.01}$ = 0.93488 |
| $d_2$ | 3.40415 – 0.01 = 3.39415 | 0.93488 – 0.01 = 0.92488 |
| Call Price | (1.0346 x N(3.40415)) – (1.00 x N(3.39415)) (1.0346 x 0.99967) – (1.00 x 0.99966) = 0.0345766 | (1.0346 x N(0.93488)) – (1.025 x N(0.92488)) (1.0346 x 0.82508) – (1.025 x 0.82249) = 0.0105545 |

$$Stock\ Price\ (S) = 1 + Inflation\ Assumption$$

$$Strike\ Price\ (K) = 1 + Floor\ or\ 1 + Cap$$

$$d_1 = \frac{ln\left(\frac{S}{K}\right)+\left(\frac{\sigma^2}{2}\right)}{\sigma}$$

$$d_2 = d_1 - \sigma$$

$$N = Normal\ Distribution\ Table$$

$$Call\ Price\ (C) = SN(d_1) - KN(d_2)$$

**$Pension\ Increase\ Assumption = Floor + Call\ Price\ (Floor) - Call\ Price\ (Cap)$**

**$Pension\ Increase\ Assumption = 0.00 + 0.0345766 - (0.0105545) = 0.024022 =$ <u>2.40%</u>**

→ **Rounded to 2.40%**

Deloitte.

Please see page 4 for important information about this document.



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