

# Transformation Appendix

## Summary

This is the Transformation Appendix to the Board's determination under Section 175(5) of the Pensions Act 2004 in respect of the 2011/12 Levy Year. It provides the formulae for transforming Section 179 Valuation results to a Section 179 basis as at 31 March 2010 for the purpose of calculating the Levies in respect of the 2011/12 Levy Year.

The formulae have been developed jointly by the Board and the Government Actuary's Department to transform valuation results which have been Submitted at the Measurement Time or otherwise provided to the Board in accordance with the Rules on a section 179 basis as at a date other than 31 March 2010 into valuation results on a Section 179 basis as at 31 March 2010 (the "Output Date").

## 1 Background

- 1.1 Each Scheme that became registrable prior to 6 April 2007 was required to submit its first Section 179 Valuation to the Board by 31 March 2008. Some Schemes will have submitted more than one section 179 valuation by 31 March 2010. The most recent information Submitted as at the Measurement Time will be used, as described in this Appendix, to assess the Scheme's funding position on the Section 179 basis as at 31 March 2010. If a Scheme failed to submit a Section 179 Valuation by this deadline but the Board has an MFR Valuation in respect of it, then the funding position as at 31 March 2010 will be calculated as described in the MFR Conversion Appendix.
- 1.2 The Section 179 Valuation result provided may have been prepared in accordance with different versions of the valuation guidance and assumptions guidance to those in force at 31 March 2010 (depending on the effective date of the Section 179 valuation and the date on which it was certified) and this is taken into account in the transformation formulae. Where the Section 179 Valuation results have been prepared in accordance with different versions of the valuation guidance, the Board has decided that no allowance will be made in the transformation methodology to account for any change in methodology.
- 1.3 A model created in conjunction with the Government Actuary's Department enables the Board to transform Section 179 Valuations to the Output Date.
- 1.4 The model itself only uses information about each Scheme on Exchange together with published data on investment market conditions.

## 2 Summary of the calculation

- 2.1 The formulae constitute a technical actuarial document which is intended to be read only by those with significant experience in carrying out actuarial calculations. For those with a broad interest in the conversion methodology, the main stages of the calculations are summarised below.
- 2.2 Transformation of the value of the Protected Liabilities on the Section 179 basis as at the input date to the value of Protected Liabilities on the Section 179 basis as at the Output Date.

- The Section 179 methodology prescribes an allowance for expenses. Where the liabilities excluding expenses are not explicitly identifiable (e.g. where, exceptionally, the Board has to use data taken from an old version of the Scheme Return) then removing this allowance is the first stage in transforming the liabilities.
- The formulae then use figures for the proportions of liabilities that relate to service before and after 6 April 1997 taken, where possible, from data Submitted as at the Measurement Time, to allow for differences in PPF compensation for service before and after 1997. Where these figures have not been given, assumptions are made.
- Ratios of annuity factors and deferred annuity factors are then used to convert the adjusted Section 179 liabilities to liabilities on Section 179 assumptions as at the Output Date.

2.3 Moving assets and the liabilities forward (or backwards) from the date of the Section 179 calculation to the Output Date.

- Liabilities are increased (or decreased) at a rate that is reasonably consistent with Section 179 assumptions, as the liabilities are now closer to (or further away from) coming into payment. The liabilities are now at the Output Date.
- The assets are assumed to achieve returns in line with certain stock market indices, allowance being made for how much of the Scheme's assets are invested in equities, bonds etc. as Submitted as at the Measurement Time.
- Neither assets nor liabilities are adjusted for benefit payments. Liabilities are not adjusted for new benefit accrual, nor are assets adjusted for contributions. The comparatively short period between the Section 179 valuation effective date and the Output Date should mean that any inaccuracies arising from this are small. Separate certification of Deficit-Reduction Contributions should be considered where these may materially affect the result.

2.4 As a final step the expenses specified for Section 179 calculations are added to the liabilities to give the final results.

### 3 Summary of outputs from and inputs to the formulae

#### 3.1 Outputs

• Assets for section 179 valuation	S179Ass
• Liabilities for pensions in payment (excluding section 179 expenses)	S179PL
• Liabilities for deferred members (excluding section 179 expenses)	S179DL
• Liabilities for active members (excluding section 179 expenses)	S179AL
• External liabilities	S179ExLiab
• section 179 estimated cost of wind-up (excluding benefit installation/payment)	S179WUExp
• section 179 estimated expenses of benefit installation/payment	S179PayExp
• Effective date of the section 179 valuation required for output (31 March 2010)	OutputDate
• Total liabilities (including section 179 expense allowance)	S179TL

#### 3.2 Inputs

The Section 179 Valuation results Submitted as at the Measurement Time:

• Assets for section 179 valuation purposes	S179InputAss
• Date of relevant accounts giving asset figure	RelAcDate
• Total value of protected liabilities	S179InputTL
• Liabilities for pensions in payment, possibly including expenses	S179InputPL
• Liabilities for deferred members, possibly including expenses	S179InputDL
• Liabilities for active members, possibly including expenses	S179InputAL
• Estimated costs of wind-up (excluding benefit installation/payment)	S179InputWUExp
• Estimated expenses of benefit installation/payment	S179InputPayExp
• Proportion of pensioner liabilities, excluding expenses, relating to service before 6 April 1997	S179InputPPre97 Ppn
• Proportion of deferred pensioner liabilities, excluding expenses, relating to service before 6 April 1997	S179InputDPre97 Ppn

• Proportion of active member liabilities, excluding expenses, relating to service before 6 April 1997	S179InputAPre97 Ppn
• Proportion of assets held in the form of insurance contracts not included in scheme accounts	S179InputInsPpn
• External liabilities	S179InputExLiab
• Effective date of the section 179 valuation	S179InputDate
• Version number of section 179 guidance used for this valuation	S179InputGuiVNo
• Version number of section 179 assumptions used for this valuation	S179InputAssVNo
Total number of pensioner members	PMemNo
Total number of deferred pensioner members	DMemNo
Total number of active members	AMemNo
• Pensioner members – average age	PAvAge
• Deferred members – average age	DAvAge
• Active members – average age	AAvAge

Scheme asset information Submitted as at the Measurement Time – percentages of the total assets as at the date of the last audited financial statement (referred to as "AssetDate" below). Note that this may be different from both the S179InputDate and the RelAcDate identified above. The value of assets at AssetDate is not known, and it may be rather different from S179InputAss where, for instance, a bulk transfer has taken place:

• Bonds	Bo%
• Equities	Eq%
• Property	Pr%
• Insurance policies (excluding managed funds and contingent annuities)	IP%
• Deferred or immediate fully insured annuities	An%
• Hedge funds	He%
• Cash and deposits	Ca%
• Commodities	Co%
• Other	Ot%
• Date of asset breakdown	AssetDate

Normal Pension Age data taken from the scheme return data

• Normal Pension Age in respect of pre-6 April 1997 benefits	NPAPre97
• Normal Pension Age in respect of post-5 April 1997 benefits	NPAPost97

Where any of the information in this section 3 has not been provided or is not in the form that the Board requires or is inconsistent, the Board will need to make assumptions. Details of the assumptions that will be made in these circumstances are set out in section 5 of this document. Note also that average ages falling outside particular ranges will be subject to adjustment (see section 5 of this document for details).

## 4 The formulae

### 4.1 Transformation of liabilities on the section 179 basis on assumptions as at the input date to the section 179 basis as at the output date

#### 4.1.1 Strip out any expense allowance from liability figures for each class of membership if necessary

If  $S179InputWUExp + S179InputPayExp > 0$   
 or  $S179InputGuiVNo=V1$  and  
 $S179InputTL > S179InputPL + S179InputDL + S179InputAL$

then the input liabilities should not contain expenses so

$$\begin{aligned} S179InputPLNoExp &= S179InputPL \\ S179InputDLNoExp &= S179InputDL \\ S179InputALNoExp &= S179InputAL \end{aligned}$$

Otherwise

$$\begin{aligned} S179InputPLNoPayExp &= \max(S179InputPL - £350 \times PMemNo, 0) \\ S179InputDLNoPayExp &= \max(S179InputDL - £500 \times DMemNo, 0) \\ S179InputALNoPayExp &= \max(S179InputAL - £500 \times AMemNo, 0) \end{aligned}$$

$$\begin{aligned} \text{And } S179InputTLNoPayExp &= S179InputPLNoPayExp \\ &+ S179InputDLNoPayExp + S179InputALNoPayExp \end{aligned}$$

$$\begin{aligned} S179InputPLNoExp &= S179InputPLNoPayExp / (1 + S179InputExp\%) \\ S179InputDLNoExp &= S179InputDLNoPayExp / (1 + S179InputExp\%) \\ S179InputALNoExp &= S179InputALNoPayExp / (1 + S179InputExp\%) \end{aligned}$$

Where

$$\begin{aligned} \text{If } S179InputTLNoPayExp < £51.5 \text{ million, then} \\ (1 + S179InputExp\%) &= 103\% \end{aligned}$$

If  $£51.5 \text{ million} \leq S179InputTLNoPayExp < £102.5 \text{ million}$ , then

$$(1 + S179InputExp\%) = (1.02 \times S179InputTLNoPayExp) / (S179InputTLNoPayExp - £0.5 \text{ million})$$

If  $S179InputTLNoPayExp \geq \text{£}102.5$  million, then

$$(1 + S179InputExp\%) = (1.01 \times S179InputTLNoPayExp) / (S179InputTLNoPayExp - \text{£}1.5 \text{ million})$$

#### **4.1.2 Divide the liabilities between those accrued before and after April 1997 (different indexation)**

$$S179InputPLPre97 = S179InputPLNoExp \times S179InputPPre97Ppn$$

$$S179InputPLPost97 = S179InputPLNoExp \times (1 - S179InputPPre97Ppn)$$

$$S179InputDLPre97 = S179InputDLNoExp \times S179InputDPre97Ppn$$

$$S179InputDLPost97 = S179InputDLNoExp \times (1 - S179InputDPre97Ppn)$$

$$S179InputALPre97 = S179InputALNoExp \times S179InputAPre97Ppn$$

$$S179InputALPost97 = S179InputALNoExp \times (1 - S179InputAPre97Ppn)$$

Details of the assumptions made where  $S179InputPPre97Ppn$ ,  $S179InputDPre97Ppn$  or  $S179InputAPre97Ppn$  have not been provided (or are not in the form required by the Board) are set out in section 5 of this document.

#### **4.1.3 Convert from section 179 assumptions as at $S179InputDate$ to section 179 assumptions as at $OutputDate$**

The financial and demographic assumptions as at  $OutputDate$  (31 March 2010) should be based on section 179 assumptions version 5.

#### **Annuities used for conversion**

##### *General assumptions for annuity factors*

- At  $S179InputDate$  where the valuation was prepared using assumptions guidance version V1, V2 or A3, Mortality: PA92 with medium cohort improvements from 1992. The 'year of use/retirement' to adopt is described in the following table for annuities at  $S179InputDate$ .
- At  $S179InputDate$  where the valuation was prepared using assumptions guidance version A4, Mortality: PCMA00 (for males) and PCFA00 (for females), as appropriate, in each case with medium cohort improvement rates, and with a 1% floor to the annual improvements, both applying from 2000. The 'year of use/retirement' to adopt is described in the following table for annuities at  $S179InputDate$
- At  $S179InputDate$  where the valuation was prepared using assumptions guidance version A5 and at  $OutputDate$ , Mortality: PCMA00 (for males) and PCFA00 (for females), as appropriate, in each case with medium cohort improvement rates, and with a 1.25% floor (for males) and a 1%

floor (for females) to the annual improvements, all applying from the year 2000. The 'year of use/retirement' to adopt is described in the following table for annuities at S179InputDate (substitute OutputDate for S179InputDate to obtain year of use/retirement applicable to annuities at OutputDate).

- At S179InputDate where the valuation was prepared under assumptions guidance other than V1, V2, A3, A4 or A5 above (for example on future versions of guidance), use assumptions that are consistent with the relevant guidance in force at that date.

<b>Annuity</b>	<b>Year of Use</b>
annuityfactorpre97	S179InputDate
annuityfactorpost97	S179InputDate

<b>Deferred Annuity</b>	<b>Year of Retirement<sup>1</sup></b>
defannuityfactorpre97def	$S179InputDate + NPAPre97 - DAvAge$
defannuityfactorpost97def	$S179InputDate + NPAPost97 - DAvAge$
defannuityfactorpre97act	$S179InputDate + NPAPre97 - AAvAge$
defannuityfactorpost97act	$S179InputDate + NPAPost97 - AAvAge$

- Age: PAvAge/DAvAge/AAvAge (as appropriate)<sup>2</sup> - where DAvAge or AAvAge > NPAPre97 or NPAPost97 as appropriate, an immediate annuity is used in place of a deferred annuity
- Sex: male
- Spouse's proportion: 50%
- Proportion married:
  - where S179InputAssVNo = V1, V2, A3 or A4, 80%
  - where S179InputAssVNo = A5 and at Output Date, 75%.
- Wife three years younger than member
- No allowance for pre-retirement mortality

<sup>1</sup> Mortality improvements are assumed to apply in deferment from S179InputDate (or OutputDate as appropriate). For example, if DAvAge is 53 and the relevant NPA is 63 and S179InputDate/OutputDate is 31 March 2010 (and so the assumed year of retirement is 2020) the deferred annuity will take account of mortality improvements up to 2020 in deferment, and thereafter take account of mortality improvements from 2020 in payment.

<sup>2</sup> Details of the assumptions made where average ages have not been provided by schemes are set out in section 5 of this document.

- Normal pension age: NPAPre97 or NPAPost97 as appropriate
- No guarantee period for annuities

*Discount rate – pre retirement*

The annuity factors applicable to non-pensioners are those prefixed by 'def'. The pre-retirement discount rate is derived as follows:

Where S179InputAssVNo = V1 or V2:

- Average of the annualised real yields on the FTSE UK Gilts Index-linked Over 15 years indices assuming 0% and 5% inflation as at S179InputDate, less 0.5%

Where S179InputAssVNo = A3:

- Average of the annualised real yields on the FTSE UK Gilts Index-linked Over 15 years indices assuming 0% and 5% inflation as at S179InputDate, less 0.7%

Where S179InputAssVNo = A4:

- Average of the annualised real yields on the FTSE UK Gilts Index-linked Over 15 years indices assuming 0% and 5% inflation as at S179InputDate (or OutputDate as appropriate), less 0.4%

Where S179InputAssVNo = A5 and at OutputDate:

- Average of the annualised real yields on the FTSE UK Gilts Index-linked Over 15 years indices assuming 0% and 5% inflation as at S179InputDate (or OutputDate as appropriate), less 0.3%.

Since there is no allowance for mortality before retirement, generally  $\text{defannuityfactor}() = (1 / (1 + i)^t) \times \text{annuityfactor}()$ , where t is the period to retirement (taken as normal pension age less DAVAge/AAVAge as appropriate).

*Discount rate – post retirement*

The post-retirement discount rate should be derived as follows:

- annuityfactorpre97, defannuityfactorpre97def and defannuityfactorpre97act:
  - where S179InputAssVNo = V1 or V2 or A3, the annualised yield on the FTSE UK Gilts 10 years Fixed Interest index
  - where S179InputAssVNo = A4, the annualised yield on the FTSE UK Gilts 10 years Fixed Interest index, plus 0.3%
  - where S179InputAssVNo = A5 and at OutputDate, the annualised yield on the FTSE UK Gilts 15 years Fixed Interest index, plus 0.6%
- annuityfactorpost97, defannuityfactorpost97def and defannuityfactorpost97act:

- where S179InputAssVNo = V1 or V2, the average of the annualised real yields on the FTSE UK Gilts Index-linked Over 5 years indices assuming 0% and 5% inflation, less 0.5%.
- Where S179InputAssVNo = A3, the maximum of A and B, where A is the average of the annualised real yields on the FTSE UK Gilts Index-linked Over 5 years indices assuming 0% and 5% inflation, less 0.5%. B is the annualised yield on the FTSE UK Gilts 10 years Fixed Interest index, less 2.5%.
- Where S179InputAssVNo = A4, the maximum of A and B, where A is the average of the annualised real yields on the FTSE UK Gilts Index-linked Over 5 years indices assuming 0% and 5% inflation, less 0.2%. B is the annualised yield on the FTSE UK Gilts 10 years Fixed Interest index, less 2.2%.
- Where S179InputAssVNo = A5 and at OutputDate, the maximum of A and B, where A is the average of the annualised real yields on the FTSE UK Gilts Index-linked Over 5 years indices assuming 0% and 5% inflation, plus 0.1%. B is the annualised yield on the FTSE UK Gilts 15 years Fixed Interest index, less 1.9%.

### **Pensioner liabilities**

$$S179PLPre97@S179InputDate = S179InputPLPre97 \times \frac{\text{annuityfactorpre97}(S179rate@OutputDate)}{\text{annuityfactorpre97}(S179rate@S179InputDate)}$$

$$S179PLPost97@S179InputDate = S179InputPLPost97 \times \frac{\text{annuityfactorpost97}(S179rate@OutputDate)}{\text{annuityfactorpost97}(S179rate@S179InputDate)}$$

### **Non-pensioner liabilities**

$$S179DLPre97@S179InputDate = S179InputDLPre97 \times \frac{\text{defannuityfactorpre97def}(S179rate@OutputDate)}{\text{defannuityfactorpre97def}(S179rate@S179InputDate)}$$

$$S179ALPre97@S179Inputdate = S179InputALPre97 \times \frac{\text{defannuityfactorpre97act}(S179rate@OutputDate)}{\text{defannuityfactorpre97act}(S179rate@S179InputDate)}$$

$$S179DLPost97@S179InputDate = S179InputDLPost97 \times \frac{\text{defannuityfactorpost97def}(S179rate@OutputDate)}{\text{defannuityfactorpost97def}(S179rate@S179InputDate)}$$

$$\begin{aligned}
& S179ALPost97@S179InputDate \\
& = S179InputALPost97 \times \frac{\text{defannuityfactorpost97act}(S179rate@OutputDate)}{\text{defannuityfactorpost97act}(S179rate@S179InputDate)}
\end{aligned}$$

## 4.2 Transforming the liabilities and external liabilities from S179InputDate to OutputDate and transforming the assets from RelAcDate to OutputDate

### 4.2.1 Liabilities

$$\begin{aligned}
& S179PLPre97@OutputDate \\
& = S179PLPre97@S179InputDate \times (1 + i)^{(OutputDate - S179InputDate)}
\end{aligned}$$

$$\begin{aligned}
& S179DLPre97@OutputDate \\
& = S179DLPre97@S179InputDate \times (1 + i)^{(OutputDate - S179InputDate)}
\end{aligned}$$

$$\begin{aligned}
& S179ALPre97@OutputDate \\
& = S179ALPre97@S179InputDate \times (1 + i)^{(OutputDate - S179InputDate)}
\end{aligned}$$

$$\begin{aligned}
& S179PLPost97@OutputDate \\
& = S179PLPost97@S179InputDate \times (1 + i)^{(OutputDate - S179InputDate)}
\end{aligned}$$

$$\begin{aligned}
& S179DLPost97@OutputDate \\
& = S179DLPost97@S179InputDate \times (1 + i)^{(OutputDate - S179InputDate)}
\end{aligned}$$

$$\begin{aligned}
& S179ALPost97@OutputDate \\
& = S179ALPost97@S179InputDate \times (1 + i)^{(OutputDate - S179InputDate)}
\end{aligned}$$

The time period  $OutputDate - S179InputDate$  is measured in years and fractions of years.

$i$  = annualised yield on the FTSE UK Gilts 15 Years Fixed Interest index as at  $OutputDate$ .

$$S179PL = S179PLPre97@OutputDate + S179PLPost97@OutputDate$$

$$S179DL = S179DLPre97@OutputDate + S179DLPost97@OutputDate$$

$$S179AL = S179ALPre97@OutputDate + S179ALPost97@OutputDate$$

### 4.2.2 External liabilities

Prior to the 2010/11 Levy Year it was the case that, depending on the source of the Section 179 Valuation data and the version of the guidance under which the valuation was prepared, external liabilities (S179InputExLiab) were either included in the total liabilities (S179InputTL) or deducted from the assets (S179InputAss). In November 2008 Exchange was upgraded to require all Schemes to enter the information with the external liabilities included in the field S179InputTL and not to deduct it from the S179InputAss field. It should therefore be the case that the condition below will always be true.

If  $S179InputTL = S179InputPL + S179InputDL + S179InputAL + S179InputWUExp + S179InputPayExp + S179InputExLiab$

Then

$$S179ExLiab = S179InputExLiab$$

$$AdjS179InputAss = S179InputAss$$

Otherwise

$$S179ExLiab = S179InputExLiab$$

$$AdjS179InputAss = S179InputAss + S179InputExLiab$$

### 4.2.3 Assets

Where  $Bo\% + Eq\% + Pr\% + IP\% + An\% + He\% + Ca\% + Co\% + Ot\% \neq 100\%$  the values will be adjusted using the approach set out in section 5 of this document.

Since the value of assets used in the Section 179 Valuation may have been adjusted to include the value of assets held in the form of insurance contracts not included in Scheme accounts, the allocation between the different asset classes needs to be adjusted to take account of this adjustment. This is allowed for by multiplying each asset class through by  $(100\% - S179InputInsPpn)$  and then adding  $S179InputInsPpn$  to the resulting proportion for the Annuities class.

Reflect returns likely to be earned or to have been earned on schemes' actual assets using, as far as possible, published information about returns on assets in different classes.

First work out the asset values at RelAcDate for each asset class.

If AssetDate = RelAcDate,

$$Bo@RelAcDate = AdjS179InputAss \times Bo\% \times (100\% - S179InputInsPpn)$$

$$Equities@RelAcDate = AdjS179InputAss \times Eq\%$$

$$\times (100\% - S179InputInsPpn)$$

$$\text{Prop@RelAcDate} = \text{AdjS179InputAss} \times \text{Pr}\% \times (100\% - \text{S179InputInsPpn})$$

$$\begin{aligned} \text{Insurance@RelAcDate} &= \text{AdjS179InputAss} \times \text{IP}\% \\ &\quad \times (100\% - \text{S179InputInsPpn}) \end{aligned}$$

$$\begin{aligned} \text{Annuities@RelAcDate} &= \text{AdjS179InputAss} \\ &\quad \times (\text{An}\% \times (100\% - \text{S179InputInsPpn}) + \text{S179InputInsPpn}) \end{aligned}$$

$$\begin{aligned} \text{Hedge@RelAcDate} &= \text{AdjS179InputAss} \times \text{He}\% \\ &\quad \times (100\% - \text{S179InputInsPpn}) \end{aligned}$$

$$\text{Cash@RelAcDate} = \text{AdjS179InputAss} \times \text{Ca}\% \times (100\% - \text{S179InputInsPpn})$$

$$\begin{aligned} \text{Commodities@RelAcDate} &= \text{AdjS179InputAss} \times \text{Co}\% \\ &\quad \times (100\% - \text{S179InputInsPpn}) \end{aligned}$$

$$\begin{aligned} \text{Other@RelAcDate} &= \text{AdjS179InputAss} \times \text{Ot}\% \\ &\quad \times (100\% - \text{S179InputInsPpn}) \end{aligned}$$

Then roll forward the asset values to OutputDate,

$$\begin{aligned} \text{Bo@OutputDate} &= \text{Bo@RelAcDate} \\ &\quad \times \frac{\text{FTSE UK Gilts All stocks TRI@OutputDate}}{\text{FTSE UK Gilts All stocks TRI@RelAcDate}} \end{aligned}$$

$$\begin{aligned} \text{Equities@OutputDate} \\ &= \text{Equities@RelAcDate} \times \text{EqRet}(\text{RelAcDate}, \text{OutputDate}) \end{aligned}$$

Where

$$\begin{aligned} \text{EqRet}(\text{RelAcDate}, \text{OutputDate}) &= 50\% \times \frac{\text{FTSE All-Share TRI@OutputDate}}{\text{FTSE All-Share TRI@RelAcDate}} \\ &\quad + 50\% \times \frac{\text{FTSE All-World ex UK TRI@OutputDate}^3}{\text{FTSE All-World ex UK TRI@RelAcDate}} \end{aligned}$$

$$\begin{aligned} \text{Prop@OutputDate} \\ &= \text{Prop@RelAcDate} \times \text{PropRet}(\text{RelAcDate}, \text{OutputDate}) \end{aligned}$$

Where

$$\text{PropRet}(\text{RelAcDate}, \text{OutputDate}) = \frac{\text{FTSE All-Share TRI@SwitchDate}}{\text{FTSE All-Share TRI@RelAcDate}}$$

$$\begin{aligned} &\times \frac{\text{FTSE All UK Property Gross TRI@OutputDate}}{\text{FTSE All UK Property Gross TRI@SwitchDate}} \end{aligned}$$

<sup>3</sup> FTSE All-World ex UK TRI (Sterling denominated) to be used

where SwitchDate = max(RelAcDate, 22 June 2006)

$$\begin{aligned} \text{Annuities@OutputDate} &= \text{Annuities@RelAcDate} \times \\ &\quad \frac{\text{FTSE UK Gilts All stocks TRI@OutputDate}}{\text{FTSE UK Gilts All stocks TRI@RelAcDate}} \end{aligned}$$

$$\begin{aligned} \text{Hedge@OutputDate} \\ &= \text{Hedge@RelAcDate} \times \text{HedgeRet}(\text{RelAcDate}, \text{OutputDate}) \end{aligned}$$

Where

$$\begin{aligned} \text{HedgeRet}(\text{RelAcDate}, \text{OutputDate}) &= \frac{\text{FTSE All-Share TRI@SwitchDate}}{\text{FTSE All-Share TRI@RelAcDate}} \\ &\times \frac{\text{HFRX Global Hedge Fund GBP Index TRI@OutputDate}}{\text{HFRX Global Hedge Fund GBP Index TRI@SwitchDate}} \end{aligned}$$

where SwitchDate = max(RelAcDate, 1 June 2005)

$$\begin{aligned} \text{Cash@OutputDate} \\ &= \text{Cash@RelAcDate} \times (1 + \text{Cashreturn\%}(\text{RelAcDate}, \text{OutputDate})) \end{aligned}$$

Cashreturn% estimated by rolling up the Bank of England base rate from RelAcDate to OutputDate

$$\begin{aligned} \text{Insurance@OutputDate} \\ &= \text{Insurance@RelAcDate} \times \text{CompRet}(\text{RelAcDate}, \text{Outputdate}) \end{aligned}$$

Where

CompRet(RelAcDate, Outputdate) = Composite roll-up factor created based on 50% of the fixed interest roll-up factor above, 25% of the equity roll-up factor and 25% of the cash roll-up factor

$$\begin{aligned} \text{Commodities@OutputDate} &= \text{Commodities@RelAcDate} \\ &\quad \times \text{CompRet}(\text{RelAcDate}, \text{Outputdate}) \end{aligned}$$

$$\text{Other@OutputDate} = \text{Other@RelAcDate} \times \text{CompRet}(\text{RelAcDate}, \text{Outputdate})$$

S179Ass

$$\begin{aligned} &= \text{Bo@OutputDate} + \text{Equities@OutputDate} \\ &\quad + \text{Prop@OutputDate} + \text{Insurance@OutputDate} \\ &\quad + \text{Annuities@OutputDate} + \text{Hedge@OutputDate} \\ &\quad + \text{Cash@OutputDate} + \text{Commodities@OutputDate} \\ &\quad + \text{Other@OutputDate} \end{aligned}$$

If AssetDate is earlier than RelAcDate

Derive the asset distribution for assets included in the accounts at RelAcDate based on the given asset distribution at AssetDate, allowing for differential asset returns based on information on returns on different investments in the period AssetDate to RelAcDate. This is done using roll forward formulae consistent with those above. The asset distribution at RelAcDate is then calculated by normalising the total to 100%. These normalised allocation percentages are then used in the formulae above to calculate the asset value at OutputDate. The adjustment for the field S179InputInsPpn then, in effect, normalises again to 100% to take account of annuities not listed in the relevant accounts.

If AssetDate is later than RelAcDate,

Derive the asset distribution for assets included in the accounts at RelAcDate based on the given asset distribution at AssetDate, allowing for differential asset returns based on information on returns on different investments in the period RelAcDate to AssetDate. In effect the roll-forward formulae above are used "in reverse" for the period from AssetDate back to RelAcDate and applied to the proportions of assets in each class as at AssetDate. The assets distribution at RelAcDate for assets included in the accounts is then calculated by normalising the total to 100%. The adjustment for the field S179InputInsPpn then, in effect, normalises again to 100% to take account of annuities not listed in the relevant accounts.

### 4.3 Application of section 179 expenses

If S179InputPayExp > 0 then

$$\text{S179PayExp} = \text{S179InputPayExp}$$

Otherwise

$$\text{S179PayExp} = \text{£}350 \times \text{PMemNo} + \text{£}500 \times (\text{DMemNo} + \text{AMemNo})$$

In all cases

If S179PL + S179DL + S179AL < £50 million, then

$$\text{S179WUExp} = (\text{S179PL} + \text{S179DL} + \text{S179AL}) \times 0.03$$

If £50million  $\leq$  S179PL + S179DL + S179AL  $<$  £100 million, then  
S179WUExp = (S179PL + S179DL + S179AL) x 0.02 + £0.5 million

If S179PL + S179DL + S179AL  $\geq$  £100 million, then  
S179WUExp = (S179PL + S179DL + S179AL) x 0.01 + £1.5 million

S179Exp = S179PayExp + S179WUExp

#### **4.4 Total liabilities on section 179 basis**

S179TL = S179PL + S179DL + S179AL + S179Exp + S179ExLiab

**5. Assumptions made where input information has not been provided in full (or not provided in the format required by the Board)**

Exchange was upgraded in November 2008 to require Schemes to enter their Section 179 Valuation information consistently with respect to external liabilities (i.e. include the external liabilities in the total liabilities and not reduce the assets). At the same time various data validation rules were tightened. It is therefore expected that the following assumptions will not be necessary for schemes whose data has been Submitted through Exchange after that date. However, they need to be retained in this document in case data needs to be used where the Scheme Return had not been completed (and thus the data validation rules not applied).

5.1 If total value of protected liabilities (S179InputTL) is provided, but S179InputPL, S179InputDL and S179InputAL are missing:

• Liabilities for pensions in payment, possibly including expenses	S179InputPL	= 0.44 x S179InputTL
• Liabilities for deferred members, possibly including expenses	S179InputDL	= 0.24 x S179InputTL
• Liabilities for active members, possibly including expenses	S179InputAL	= 0.29 x S179InputTL

Where  $S179InputTL <> S179InputPL + S179InputDL + S179InputAL + S179InputWUExp + S179InputPayExp + S179InputExLiab$

then the PPF will adjust the input values in the way it considers most appropriate so that the total figure equals the sum of the relevant parts.

5.2 If the proportions of liabilities relating to service before 6 April 1997 are not provided (or not provided in the format required by the PPF) the following will be assumed:

• Proportion of pensioner liabilities, excluding expenses, relating to service before 6 April 1997	S179InputPPre97Ppn	= 0.9
• Proportion of deferred pensioner liabilities, excluding expenses, relating to service before 6 April 1997	S179InputDPre97Ppn	= 0.8
• Proportion of active member liabilities, excluding expenses, relating to service before 6 April 1997	S179InputAPre97Ppn	= 0.6

5.3 Where the total of the percentages of the assets in each asset class (Bo% + Eq% + Pr% + IP% + An% + He% + Ca% + Co% + Ot%) is less than 100% (or no breakdown is provided), Ca% will be increased to give a total of 100%. Where the total of the percentages of the assets in each class is greater than 100%, the percentages will be pro-rated so as to give an adjusted total equal to 100%.

5.4 If PMemNo + DMemNo + AMemNo = 0 but total membership number, TotMemNo, is provided then

• Pensioner members	PMemNo	= 0.45 x TotMemNo
• Deferred members	DMemNo	= 0.25 x TotMemNo
• Active members	AMemNo	= 0.30 x TotMemNo

5.5 Where average ages of different classes of members are not provided (or are not provided in the format required by the PPF) the following will be assumed

• Pensioner members	PAvAge	66
• Deferred members	DAvAge	46
• Active members	AAvAge	46

5.6 Note also that where average ages have been provided, if they fall outside of particular ranges, they will be subject to the following adjustments

• Pensioner members	PAvAge	PAvAge > 120 reduced to 66, PAvAge < 25 increased to 25
• Deferred members	DAvAge	DAvAge > 75 reduced to 46, DAvAge < 25 increased to 25
• Active members	AAvAge	AAvAge > 75 reduced to 46, AAvAge < 25 increased to 25

5.7 Where the number of the valuation guidance has not been provided, guidance number V2 will be assumed. Where the number of the assumptions guidance has not been provided, guidance number V2 will be assumed.

5.8 Where the date of relevant accounts is not provided, it will be assumed to be equal to the effective date of the Section 179 Valuation.

5.9 Where NPAPre97 or NPAPost97 have not been provided, 63 will be used.

5.10 Where S179InsPpn has not been provided, 0 will be assumed.