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 2019/20 Levy Year (the "**Determination**"). It provides the formulae for transforming Section 179 Valuation results for the purpose of calculating the Levies in respect of the 2019/20 Levy Year. The transformation involves:

- transforming any Section 179 Valuation results on to a Section 179 basis as at 31 March 2019, using version A8 of the valuation assumptions guidance;
- moving the assets and liabilities forward (or backwards) from the date of the Section 179 Valuation to 31 March 2019;
- adjusting the Section 179 Valuation so as to exclude any value attributed to an ABC Arrangement;
- adjusting the results to reflect smoothed market conditions, calculated by averaging market data over five years to 31 March 2019; and
- applying stress factors to adjust the assets and liabilities to reflect their sensitivity to specified shocks in economic conditions.

A similar transformation (with the final step above omitted) is used to calculate smoothed but unstressed asset and liability values.

The formulae have been developed by the Board to transform valuation results which have been Submitted at the Measurement Time or otherwise provided to the Board in accordance with the Rules into valuation results as at 31 March 2019 (the "Output Date"), on:

- a smoothed and stressed Section 179 basis; and
- a smoothed but unstressed Section 179 basis.

For the purposes of this Appendix, "Input Date" is the effective date of the Section 179 Valuation or MFR Valuation of the Scheme as is used under Rule D2 of the Determination, or, in a case to which Parts F1-F3 of the Rules apply, to the relevant Post-Transfer Valuation.

This Appendix also covers the transformation of Contingent Asset valuations for the purpose of calculating the Levies in respect of the 2019/20 Levy Year.

1 Background

1.1 The most recent Section 179 Valuation Submitted as at the Measurement Time will be used, as described in this Appendix, to assess the Scheme's funding position on the smoothed and (where applicable) stressed Section 179 basis as at 31 March 2019. 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 2019 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 a version of the valuation assumptions guidance other than version A8 (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 methodology guidance (for example G7 compared to G8), the Board has decided that no allowance will be made in the transformation formulae to account for any change in methodology.

1.3 The transformation model only uses information about each Scheme as taken from Exchange together with 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 the liabilities on the smoothed and stressed Section 179 basis as at the Output Date, using version A8 of the valuation assumptions guidance:

- 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 6 April 1997, between 6 April 1997 and 5 April 2009 (both dates inclusive) and after 5 April 2009 taken, where possible, from data Submitted as at the Measurement Time, to allow for differences in PPF compensation for service attributable to these respective periods. 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 smoothed and stressed Section 179 assumptions as at the Output Date, using version A8 of the valuation assumptions guidance.

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

- The assets (excluding any value attributed to an ABC Arrangement) are assumed to achieve returns in line with certain smoothed 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.
- Liabilities are increased (or decreased) at rates that are reasonably consistent with smoothed and stressed Section 179 assumptions, as the liabilities are now closer to (or further away from) coming into payment. As a consequence of smoothing market conditions over a five year period, the transformed asset value has an effective valuation date at the mid point of the averaging period. For consistency the liability value at the Output Date is moved forward (or backwards) to the same point.
- 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 The expenses specified for Section 179 calculations are added to the liabilities to give the total liability value.

2.5 The smoothed asset values are multiplied by stress factors to reflect their sensitivity to specified shocks in economic conditions, e.g. interest rates and equity prices.

2.6 The unstressed values of assets and liabilities are calculated in a similar way to the smoothed and stressed values, but:

- without the application of the stress factors to the smoothed asset value;
- converting the liabilities using annuity factors and deferred annuity factors which reflect smoothed but unstressed Section 179 assumptions as at the Output Date; and
- moving the liability value forward (or backwards) from the date of the Section 179 Valuation at rates that are reasonably consistent with smoothed but unstressed Section 179 assumptions.

3 Summary of outputs from and inputs to the formulae

3.1 Outputs

• Effective date of the asset and liability valuations required for output (31 March 2019)	OutputDate
• Smoothed and stressed asset value	S179Ass
• Smoothed and stressed 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	S179InputAss
• Proportion of assets held in the form of insurance contracts not included in scheme accounts	S179InputInsPpn
• Date of relevant accounts giving asset figure	RelAcDate
• Effective date of the Section 179 valuation	S179InputDate
• 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
• External liabilities	S179InputExLiab
• Total value of protected liabilities	S179InputTL
• Proportion of pensioner liabilities, excluding expenses, relating to service before 6 April 1997	S179InputPPre97Ppn
• Proportion of deferred pensioner liabilities, excluding expenses, relating to service before 6 April 1997	S179InputDPre97Ppn
• Proportion of deferred pensioner liabilities, excluding expenses, relating to service between 6 April 1997 and 5 April 2009	S179InputD97_09Ppn
• Proportion of active member liabilities, excluding expenses, relating to service before 6 April 1997	S179InputAPre97Ppn
• Proportion of active member liabilities, excluding expenses, relating to service between 6 April 1997 and 5 April 2009	S179InputA97_09Ppn

• 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

Where membership numbers are not included in the Section 179 Valuation results Submitted as at the Measurement Time, the total membership number may be determined from a different source.

• Total membership number	TotMemNo

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

• Bonds	Bo%
• Proportion of bonds which are fixed interest government bonds	Go%
• Proportion of bonds which are fixed interest non-government bonds	NG%
• Proportion of bonds which are inflation-linked bonds	IL%
• Equities	Eq%
• Proportion of equities which are UK quoted equities	UK%
• Proportion of equities which are overseas quoted equities	OS%
• Proportion of equities which are unquoted equities/private equity	PE%
• Property	Pr%
• Insurance funds	In%
• Deferred or immediate fully insured annuities	An%
• Hedge funds	He%
• Cash and net current assets	Ca%
• Commodities	Co%
• ABC Arrangement	ABC%
• Other	Ot%
• Date of asset breakdown	AssetDate

Schemes with s179 protected liabilities of £1.5 billion or more are required to carry out a bespoke stress analysis on their asset allocation and to Submit the results by the Measurement Time. Other schemes have the option to Submit a bespoke stress analysis on a voluntary basis. Such calculations should be carried out as at the date of the most recently audited scheme accounts (i.e. the "AssetDate" above) and with reference to the Investment Risk Appendix and the Investment Risk Guidance.

• Stressed value of assets calculated from bespoke stress analysis as at date of the most recently audited scheme accounts	BespokeStr
• Unstressed value of assets as at date of the most recently audited scheme accounts	BespokeUnStr

For schemes with an ABC Arrangement, Part A of the Rules sets out the value of the ABC Arrangement that will be removed from the assets prior to calculating underfunding, the "s179 ABC Amount". For the avoidance of doubt, where the Board is satisfied that no value has been attributed to an ABC Arrangement in the assets used for the Section 179 or MFR Valuation that is used under Rule D2 or, in a case to which Parts F1-F3 of the Rules apply, the relevant Post-Transfer Valuation (whether because the ABC Arrangement was entered into after the effective date of the relevant valuation or otherwise), the s179ABCAmount shall be zero.

• s179 ABC Amount, as defined in Part A of the Rules	s179ABCAmount

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 benefits accrued between 6 April 1997 and 5 April 2009	NPA97_09
• Normal Pension Age in respect of post-5 April 2009 benefits	NPAPost09

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 Smoothing

Asset and liability values are smoothed based on market conditions over a five year period up to the Output Date. This is achieved by smoothing the underlying yields that feed into the liability transformation and smoothing the indices that feed into the asset transformation.

Smoothed yields and indices as at the Output Date should be determined as the arithmetic mean of the end of day values for each day excluding weekends over the five year period ending on the last such day preceding or coincident with the Output Date.

Where no published yield or index is available for a particular day (for example Bank Holidays or indices published on a monthly basis), the most recent yield or index available on that day shall be used.

4.2 Stress factors

Liability stress factors		
Interest rate stress factor	IntStrFac	-0.75%
Inflation stress factor	InflnStrFac	-0.14%

The inflation stress factor above represents the difference between a real rate stress factor of -0.61% and a nominal rate stress factor of -0.75% (equivalent to the interest rate stress factor), producing a negative result of -0.14%.

Asset stress factors		
Fixed interest government bonds	GoStrFac	+15%
Fixed interest non-government bonds	NGStrFac	+3%
Inflation-linked bonds	ILStrFac	+15%
UK quoted equities	UKStrFac	-19%
Overseas quoted equities	OSStrFac	-16%
Unquoted equities / private equity	PEStrFac	-19%
Property	PrStrFac	-5%
Insurance funds	InStrFac	-19%
Annuities	AnStrFac	+16%
Hedge funds	HeStrFac	-3%
Cash	CaStrFac	+0%
Commodities	CoStrFac	-14%
Other	OtStrFac	-19%

4.3 Transformation of liabilities on the Section 179 basis on assumptions as at the Input Date to the smoothed and stressed Section 179 basis as at the Output Date

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

If S179InputWUExp + S179InputPayExp > 0

or S179InputAssVNo=V1 and
S179InputTL>S179InputPL+ S179InputDL+ S179InputAL

then the input liabilities should not contain expenses so

S179InputPLNoExp = S179InputPL

S179InputDLNoExp = S179InputDL

S179InputALNoExp = S179InputAL

Otherwise

If S179InputAssVNo = A7, A8 or A9

Then

S179InputPLNoPayExp = max(S179InputPL - £700 x PMemNo, 0)

S179InputDLNoPayExp = max(S179InputDL - £1,000 x DMemNo, 0)

S179InputALNoPayExp = max(S179InputAL - £1,000 x AMemNo, 0)

If S179InputAssVNo = V1, V2, A3, A4, A5 or A6

Then

S179InputPLNoPayExp = max(S179InputPL - £350 x PMemNo, 0)

S179InputDLNoPayExp = max(S179InputDL - £500 x DMemNo, 0)

S179InputALNoPayExp = max(S179InputAL - £500 x AMemNo, 0)

and for all S179InputAssVNo,

S179InputTLNoPayExp = S179InputPLNoPayExp
+ S179InputDLNoPayExp + S179InputALNoPayExp

If S179InputAssVNo = V1, V2, A3, A4, A5, A6, A7, A8 or A9

S179InputPLNoExp = S179InputPLNoPayExp / (1 + S179InputExp%)

S179InputDLNoExp = S179InputDLNoPayExp / (1 + S179InputExp%)

S179InputALNoExp = S179InputALNoPayExp / (1 + S179InputExp%)

where

If S179InputTLNoPayExp < £51.5 million, then

(1+ S179InputExp%) = 1.03

If £51.5 million =< S179InputTLNoPayExp < £102.5 million, then

(1+ S179InputExp%) = (1.02 x S179InputTLNoPayExp) /
(S179InputTLNoPayExp – £0.5 million)

If S179InputTLNoPayExp >= £102.5 million, then

(1+ S179InputExp%) = (1.01 x S179InputTLNoPayExp) /
(S179InputTLNoPayExp – £1.5 million)

4.3.2 Divide the liabilities between those accrued before April 1997, between April 1997 and April 2009, and after April 2009 (different indexation and revaluation)

S179InputPLPre97 = S179InputPLNoExp x S179InputPPre97Ppn

S179InputPLPost97 = S179InputPLNoExp x (1 – S179InputPPre97Ppn)

S179InputDLPre97 = S179InputDLNoExp x S179InputDPre97Ppn

S179InputDL97_09 = S179InputDLNoExp x S179InputD97_09Ppn

S179InputDLPost09 = S179InputDLNoExp x (1 – S179InputDPre97Ppn – S179InputD97_09Ppn)

S179InputALPre97 = S179InputALNoExp x S179InputAPre97Ppn

S179InputAL97_09 = S179InputALNoExp x S179InputA97_09Ppn

S179InputALPost09 = S179InputALNoExp x (1 – S179InputAPre97Ppn – S179InputA97_09Ppn)

Details of the assumptions made where S179InputPPre97Ppn, S179InputDPre97Ppn, S179InputD97_09Ppn, S179InputAPre97Ppn or S179InputA97_09Ppn have not been provided (or are not in the form required by the Board) are set out in section 5 of this document.

4.3.3 Convert from Section 179 assumptions as at S179InputDate to smoothed and stressed Section 179 assumptions as at OutputDate

The financial and demographic assumptions as at OutputDate (31 March 2019) should be based on Section 179 assumptions version A8.

Annuities used for conversion

General assumptions for annuity factors

The following section specifies the calculation of mortality, discount rates and other parameters, depending on whether the valuation at S179InputDate was prepared under assumptions guidance V1, V2, A3, A4, A5, A6, A7, A8 or A9. If the valuation at S179InputDate was prepared under assumptions guidance other than V1, V2, A3, A4, A5, A6, A7, A8 or A9 (for example on future versions of guidance), use assumptions that are consistent with the relevant guidance in force at that date.

- 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, 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.
- At S179InputDate where the valuation was prepared using assumptions guidance version A6, Mortality: PCMA00 (for males) and PCFA00 (for females), as appropriate, in each case with medium cohort improvement rates, and with a 1.5% 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.
- At S179InputDate where the valuation was prepared using assumptions guidance version A7, Mortality: S1PMA (for males) and S1PFA (for females), as appropriate, in each case adjusted to apply a factor of 0.9 to the q_xs, with future changes in line with CMI_2012_M [1.50 per cent] (for males) and CMI_2012_F [1.00 per cent] (for females), all applying from the year 2002. 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 A8 and at Output Date, Mortality: S2PMA (for males) and S2PFA (for females), as appropriate, with future changes in line with CMI_2014_M [1.50 per cent] (for males) and CMI_2014_F [1.25 per cent] (for females), all applying from the year 2007. 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 using assumptions guidance version A9, Mortality: S2PMA (for males) and S2PFA (for females), as appropriate, with future changes in line with CMI_2016_M [1.50 per cent] (for males) and CMI_2016_F [1.25 per cent] (for females) together with a smoothing parameter of 7.5, all applying from the year 2007. The 'year of use/retirement' to adopt is described in the following table for annuities at S179InputDate.

Annuity	**Year of Use**
annuityfactorpre97	S179InputDate
annuityfactorpost97	S179InputDate

Deferred Annuity	**Year of Retirement[1]**
defannuityfactorpre97def	S179InputDate + NPAPre97 – DAvAge
defannuityfactor97_09def	S179InputDate + NPA97_09 – DAvAge

[1] 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 2019 (and so the assumed year of retirement is 2029) the deferred annuity will take account of mortality improvements up to 2029 in deferment, and thereafter take account of mortality improvements from 2029 in payment.

defannuityfactorpost09def	S179InputDate + NPAPost09 – DAvAge
defannuityfactorpre97act	S179InputDate + NPAPre97 – AAvAge
defannuityfactor97_09act	S179InputDate + NPA97_09 – AAvAge
defannuityfactorpost09act	S179InputDate + NPAPost09 – AAvAge

- Age: PAvAge, DAvAge or AAvAge (as appropriate)[2] - where DAvAge or AAvAge > NPAPre97, NPA97_09 or NPAPost09 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, A6, A7, A8 or A9 and at Output Date, 75%.
- Wife three years younger than member
- No allowance for pre-retirement mortality
- Normal pension age: NPAPre97, NPA97_09 or NPAPost09 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:

- defannuityfactorpre97def, defannuityfactor97_09def, defannuityfactorpre97act, defannuityfactor97_09act:
    - Where S179InputAssVNo = V1 or V2, Yield A(i) as at S179InputDate, less 0.5%
    - Where S179InputAssVNo = A3, Yield A(i) as at S179InputDate, less 0.7%
    - Where S179InputAssVNo = A4, Yield A(i) as at S179InputDate, less 0.4%
    - Where S179InputAssVNo = A5, A6 or A7, Yield A(i) as at S179InputDate, less 0.3%
    - Where S179InputAssVNo = A8, Yield A(ii) as at S179InputDate
    - Where S179InputAssVNo = A9, Yield A(ii) as at S179InputDate, plus 0.2%
    - At OutputDate, Smoothed Yield A(ii) as at OutputDate, plus IntStrFac, less InflnStrFac.

Yield A(i) should be determined as 50% of the sum of the annualised real yields on the FTSE UK Gilts Index-Linked over 15 years indices assuming 0% and 5% inflation.

Yield A(ii) should be determined as 50% of the sum of the annualised real yields on the FTSE UK Gilts Index-Linked 5 to 15 years indices assuming 0% and 5% inflation.

Smoothed Yield A(ii) should be determined as the five-year average of the daily values of Yield A(ii) in line with subsection 4.1 above.

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

- defannuityfactorpost09def, defannuityfactorpost09act:
    - Where S179InputAssVNo = V1 or V2, Yield A(i) as at S179InputDate, less 0.5%
    - Where S179InputAssVNo = A3, Yield A(i) as at S179InputDate, less 0.7%
    - Where S179InputAssVNo = A4, Yield A(i) as at S179InputDate, less 0.4%
    - Where S179InputAssVNo = A5 or A6, the maximum of:
        - Yield A(i) as at S179InputDate, less 0.3%: and
        - Yield B(i) as at S179InputDate, less 2.6%.
    - Where S179InputAssVNo = A7, the maximum of:
        - Yield A(i) as at S179InputDate, less 0.3%: and
        - Yield B(i) as at S179InputDate, less 2.2%.
    - Where S179InputAssVNo = A8, the maximum of:
        - Yield A(ii) as at S179InputDate: and
        - Yield B(ii) as at S179InputDate, less 2.5%.
    - Where S179InputAssVNo = A9, the maximum of:
        - Yield A(ii) as at S179InputDate, plus 0.2%: and
        - Yield B(ii) as at S179InputDate, less 2.5%.
    - At OutputDate, the maximum of:
        - Smoothed Yield A(ii) as at OutputDate, plus IntStrFac less InflnStrFac: and
        - Smoothed Yield B(ii) as at OutputDate, less 2.5% plus IntStrFac.

Yield B(i) should be determined as the annualised yield on the FTSE UK Gilts 20 years Fixed Interest index.

Yield B(ii) should be determined as the annualised yield on the FTSE UK Gilts 15 years Fixed Interest index.

Smoothed Yield B(ii) should be determined as the five-year average of the daily values of Yield B(ii) in line with subsection 4.1 above.

Since there is no allowance for mortality before retirement, generally defannuityfactor() = $(1 / (1 + i)^t)$ x annuityfactor(), where t is the period to retirement (taken as normal pension age less DAvAge or AAvAge as appropriate) and i is the relevant pre retirement discount rate.

Discount rate – post retirement

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

- defannuityfactorpre97def and defannuityfactorpre97act:
    - Where S179InputAssVNo = V1 or V2 or A3, Yield C(i) as at S179InputDate
    - Where S179InputAssVNo = A4, Yield C(i) as at S179InputDate, plus 0.3%
    - Where S179InputAssVNo = A5, Yield C(ii) as at S179InputDate, plus 0.6%
    - Where S179InputAssVNo = A6, Yield C(ii) as at S179InputDate, plus 0.4%

- Where S179InputAssVNo = A7, Yield C(ii) as at S179InputDate, less 0.1%
- Where S179InputAssVNo = A8, Yield C(iii) as at S179InputDate, less 0.4%
- Where S179InputAssVNo = A9, Yield C(iii) as at S179InputDate, less 0.2%
- At OutputDate, Smoothed Yield C(iii) as at OutputDate, less 0.4%, plus IntStrFac

- annuityfactorpre97:
  - Where S179InputAssVNo = V1 or V2 or A3, Yield C(i) as at S179InputDate
  - Where S179InputAssVNo = A4, Yield C(i) as at S179InputDate, plus 0.3%
  - Where S179InputAssVNo = A5, Yield C(ii) as at S179InputDate, plus 0.6%
  - Where S179InputAssVNo = A6, Yield C(ii) as at S179InputDate, plus 0.4%
  - Where S179InputAssVNo = A7, Yield C(ii) as at S179InputDate, less 0.1%
  - Where S179InputAssVNo = A8 or A9, Yield C(i) as at S179InputDate, plus 0.3%
  - At OutputDate, Smoothed Yield C(i) as at OutputDate, plus 0.3%, plus IntStrFac

Yield C(i) should be determined as the annualised yield on the FTSE UK Gilts 10 years Fixed Interest index.

Yield C(ii) should be determined as the annualised yield on the FTSE UK Gilts 15 years Fixed Interest index.

Yield C(iii) should be determined as the annualised yield on the FTSE UK Gilts 20 years Fixed Interest index.

Smoothed Yield C(i) should be determined as the five-year average of the daily values of Yield C(i) in line with subsection 4.1 above.

Smoothed Yield C(iii) should be determined as the five-year average of the daily values of Yield C(iii) in line with subsection 4.1 above.

- defannuityfactor97_09def, defannuityfactorpost09def, defannuityfactor97_09act, defannuityfactorpost09act:
  - Where S179InputAssVNo = V1 or V2, Yield D(i) as at S179InputDate, less 0.5%
  - Where S179InputAssVNo = A3, the maximum of:
    - Yield D(i) as at S179InputDate, less 0.5%; and
    - Yield C(i) as at S179InputDate, less 2.5%.
  - Where S179InputAssVNo = A4 , the maximum of:
    - Yield D(i) as at S179InputDate, less 0.2%; and
    - Yield C(i) as at S179InputDate, less 2.2%.
  - Where S179InputAssVNo = A5, the maximum of:
    - Yield D(i) as at S179InputDate, plus 0.1%; and
    - Yield C(ii) as at S179InputDate, less 1.9%.

- Where S179InputAssVNo = A6, the maximum of:
  - Yield D(i) as at S179InputDate, plus 0.1%; and
  - Yield C(ii) as at S179InputDate, less 2.1%.
- Where S179InputAssVNo = A7, the maximum of:
  - Yield D(i) as at S179InputDate, plus 0.1%; and
  - Yield C(ii) as at S179InputDate, less 2.2%.
- Where S179InputAssVNo = A8, the maximum of:
  - Yield D(i) as at S179InputDate, plus 0.2%; and
  - Yield C(iii) as at S179InputDate, less 2.6%.
- Where S179InputAssVNo = A9, the maximum of:
  - Yield D(i) as at S179InputDate, plus 0.4%; and
  - Yield C(iii) as at S179InputDate, less 2.6%.
- At OutputDate, the maximum of:
  - Smoothed Yield D(i) as at OutputDate, plus 0.2% plus IntStrFac less InflnStrFac; and
  - Smoothed Yield C(iii) as at OutputDate, less 2.6% plus IntStrFac.

- annuityfactorpost97:
  - Where S179InputAssVNo = V1 or V2, Yield D(i) as at S179InputDate, less 0.5%
  - Where S179InputAssVNo = A3, the maximum of:
    - Yield D(i) as at S179InputDate, less 0.5%; and
    - Yield C(i) as at S179InputDate, less 2.5%.
  - Where S179InputAssVNo = A4 , the maximum of:
    - Yield D(i) as at S179InputDate, less 0.2%; and
    - Yield C(i) as at S179InputDate, less 2.2%.
  - Where S179InputAssVNo = A5, the maximum of:
    - Yield D(i) as at S179InputDate, plus 0.1%; and
    - Yield C(ii) as at S179InputDate, less 1.9%.
  - Where S179InputAssVNo = A6, the maximum of:
    - Yield D(i) as at S179InputDate, plus 0.1%; and
    - Yield C(ii) as at S179InputDate, less 2.1%.
  - Where S179InputAssVNo = A7, the maximum of:
    - Yield D(i) as at S179InputDate, plus 0.1%; and
    - Yield C(ii) as at S179InputDate, less 2.2%.
  - Where S179InputAssVNo = A8, the maximum of:
    - Yield D(ii) as at S179InputDate, plus 0.9%; and
    - Yield C(i) as at S179InputDate, less 1.6%.

- Where S179InputAssVNo = A9, the maximum of:
  - Yield D(ii) as at S179InputDate, plus 1.1%; and
  - Yield C(i) as at S179InputDate, less 1.5%.
- At OutputDate, the maximum of:
  - Smoothed Yield D(ii) as at OutputDate, plus 0.9% plus IntStrFac less InflnStrFac; and
  - Smoothed Yield C(i) as at OutputDate, less 1.6% plus IntStrFac.

Yield D(i) should be determined as 50% of the sum of the annualised real yields on the FTSE UK Gilts Index-Linked over 5 years indices assuming 0% and 5% inflation.

Yield D(ii) should be determined as 50% of the sum of the annualised real yields on the FTSE UK Gilts Index-Linked 5 to 15 years indices assuming 0% and 5% inflation.

Smoothed Yield D(i) should be determined as the five-year average of the daily values of Yield D(i) in line with subsection 4.1 above.

Smoothed Yield D(ii) should be determined as the five-year average of the daily values of Yield D(ii) in line with subsection 4.1 above.

In the formulae below, S179rate@OutputDate and S179rate@S179InputDate refer respectively to the smoothed and stressed S179 basis applicable at Output Date and the unsmoothed, unstressed S179 basis applicable at S179Input Date, determined in accordance with the subsections above.

Pensioner liabilities

S179PLPre97@S179InputDate

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

S179PLPost97@S179InputDate

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

Non-pensioner liabilities

S179DLPre97@S179InputDate

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

S179DL97_09@S179InputDate

$$= \text{S179InputDL97\_09} \times \frac{\text{defannuityfactor97\_09def(S179rate@OutputDate)}}{\text{defannuityfactor97\_09def(S179rate@S179InputDate)}}$$

S179DLPost09@S179InputDate

$$= \text{S179InputDLPost09} \times \frac{\text{defannuityfactorpost09def(S179rate@OutputDate)}}{\text{defannuityfactorpost09def(S179rate@S179InputDate)}}$$

S179ALPre97@S179InputDate

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

S179AL97_09@S179InputDate

$$= S179InputAL97\_09 \times \frac{defannuityfactor97\_09act(S179rate@OutputDate)}{defannuityfactor97\_09act(S179rate@S179InputDate)}$$

S179ALPost09@S179InputDate

$$= S179InputALPost09 \times \frac{defannuityfactorpost09act(S179rate@OutputDate)}{defannuityfactorpost09act(S179rate@S179InputDate)}$$

4.4 Transforming the smoothed and stressed liabilities and external liabilities from S179InputDate to OutputDate, and transforming the assets from RelAcDate to OutputDate with allowance for smoothing

4.4.1 Liabilities

S179PLPre97@OutputDate

$$= S179PLPre97@S179InputDate \times (1 + i)^{(OutputDate - S179InputDate) - 2.5 \text{ years}}$$

S179PLPost97@OutputDate

$$= S179PLPost97@S179InputDate \times (1 + i)^{(OutputDate - S179InputDate) - 2.5 \text{ years}}$$

S179DLPre97@OutputDate

$$= S179DLPre97@S179InputDate \times (1 + j)^{(OutputDate - S179InputDate) - 2.5 \text{ years}}$$

S179DL97_09@OutputDate

$$= S179DL97\_09@S179InputDate \times (1 + j)^{(OutputDate - S179InputDate) - 2.5 \text{ years}}$$

S179DLPost09@OutputDate

$$= S179DLPost09@S179InputDate \times (1 + j)^{(OutputDate - S179InputDate) - 2.5 \text{ years}}$$

S179ALPre97@OutputDate

$$= S179ALPre97@S179InputDate \times (1 + j)^{(OutputDate - S179InputDate) - 2.5 \text{ years}}$$

S179AL97_09@OutputDate

$$= S179AL97\_09@S179InputDate \times (1 + j)^{(OutputDate - S179InputDate) - 2.5 \text{ years}}$$

S179ALPost09@OutputDate

$$= S179ALPost09@S179InputDate \times (1 + j)^{(OutputDate - S179InputDate) - 2.5 \text{ years}}$$

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

i = Smoothed Yield C(i) as at OutputDate, plus IntStrFac.

j = Smoothed Yield C(iii) as at OutputDate, plus IntStrFac.

S179PL = S179PLPre97@OutputDate + S179PLPost97@OutputDate

S179DL = S179DLPre97@OutputDate + S179DL97_09@OutputDate
+ S179DLPost09@OutputDate

S179AL = S179ALPre97@OutputDate + S179AL97_09@OutputDate
+ S179ALPost09@OutputDate

4.4.2 External liabilities and ABC Arrangements

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.

The calculation below is also designed to exclude any value attributed in the Section 179 Valuation to an ABC Arrangement.

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

Then

S179ExLiab = S179InputExLiab

AdjS179InputAss = S179InputAss - s179ABCAmount

Otherwise

S179ExLiab = S179InputExLiab

AdjS179InputAss = S179InputAss + S179InputExLiab -

s179ABCAmount

4.4.3 Assets

Where Go% + NG% + IL% ≠ 100% the values will then be adjusted using the approach set out in section 5 of this document.

Where UK% + OS% + PE% ≠ 100% the values will then be adjusted using the approach set out in section 5 of this document.

Where Bo% + Eq% + Pr% + In% + An% + He% + Ca% + Co% + ABC% +Ot% ≠ 100% the values will then be adjusted using the approach set out in section 5 of this document.

The asset splits will then be adjusted to exclude any proportion in relation to an ABC Arrangement. The remaining asset classes will then be scaled up to 100% as follows.

Bo%Adj = Bo% / (1 - ABC%)

Eq%Adj = Eq% / (1 - ABC%)

Pr%Adj = Pr% / (1 - ABC%)

In%Adj = In% / (1 - ABC%)

An%Adj = An% / (1 - ABC%)

He%Adj = He% / (1 - ABC%)

Ca%Adj = Ca% / (1 - ABC%)

Co%Adj = Co% / (1 - ABC%)

Ot%Adj = Ot% / (1 - ABC%)

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 may need to be adjusted to take account of this adjustment. This is allowed for, where appropriate, by multiplying each asset class (excluding any value attributed to an ABC Arrangement using the scaling up calculation above) through by (100% - S179InputInsPpnAdj) and then adding S179InputInsPpnAdj to the resulting proportion for the Annuities class.

For scheme accounting years commencing on or after 1 January 2015, the contracts underlying S179InputInsPpn will be included in the accounts and will therefore also be in the asset breakdown at AssetDate (typically within An%). In these cases, if the accounts underlying the Section 179 Valuation relate to a scheme accounting year commencing before 1 January 2015, then the adjustments described in the above paragraph are not appropriate due to the potential for inconsistent treatment of annuity contracts between the asset value in the Section 179 Valuation and the asset breakdown at AssetDate.

This potential for inconsistent treatment is addressed by setting S179InputInsPpnAdj to zero when the accounting period corresponding to AssetDate commenced on or after 1 January 2015 and RelAcDate is before 31 December 2015.

If AssetDate is on or after 31 December 2015 and RelAcDate is before 31 December 2015 and the Board has not received evidence that the accounting period corresponding to AssetDate commenced before 1 January 2015:

S179InputInsPpnAdj = 0

Else

S179InputInsPpnAdj = S179InputInsPpn * S179InputAss / (S179InputAss - s179ABCAmount)

Then roll forward to the Output Date, reflecting smoothed 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,

Go@RelAcDate = AdjS179InputAss x Bo%Adj x Go% x (100% - S179InputInsPpnAdj)

NG@RelAcDate = AdjS179InputAss x Bo%Adj x NG% x (100% - S179InputInsPpnAdj)

IL@RelAcDate = AdjS179InputAss x Bo%Adj x IL% x (100% - S179InputInsPpnAdj)

UK@RelAcDate = AdjS179InputAss x Eq%Adj x UK% x (100% - S179InputInsPpnAdj)

OS@RelAcDate = AdjS179InputAss x Eq%Adj x OS% x (100% - S179InputInsPpnAdj)

PE@RelAcDate = AdjS179InputAss x Eq%Adj x PE% x (100% - S179InputInsPpnAdj)

Prop@RelAcDate = AdjS179InputAss x Pr%Adj x (100% - S179InputInsPpnAdj)

Insurance@RelAcDate = AdjS179InputAss x In%Adj x (100% - S179InputInsPpnAdj)

Annuities@RelAcDate = AdjS179InputAss x (An%Adj x (100% - S179InputInsPpnAdj) + S179InputInsPpnAdj)

Hedge@RelAcDate = AdjS179InputAss x He%Adj x (100% - S179InputInsPpnAdj)

Cash@RelAcDate = AdjS179InputAss x Ca%Adj x (100% - S179InputInsPpnAdj)

Commodities@RelAcDate = AdjS179InputAss x Co%Adj x (100% - S179InputInsPpnAdj)

Other@RelAcDate = AdjS179InputAss x Ot%Adj x (100% - S179InputInsPpnAdj)

Then roll forward the asset values to OutputDate with allowance for smoothing,

Go@OutputDate = Go@RelAcDate x BoRet(RelAcDate, OutputDate)

NG@OutputDate = NG@RelAcDate x BoRet(RelAcDate, OutputDate)

IL@OutputDate = IL@RelAcDate x BoRet(RelAcDate, OutputDate)

UK@OutputDate
= UK@RelAcDate x UKRet(RelAcDate, OutputDate)

OS@OutputDate
= OS@RelAcDate x OSRet(RelAcDate, OutputDate)

PE@OutputDate

= PE@RelAcDate x UKRet(RelAcDate, OutputDate)

Prop@OutputDate

= Prop@RelAcDate x PrRet(RelAcDate, OutputDate)

Annuities@OutputDate

= Annuities@RelAcDate x BoRet(RelAcDate, OutputDate)

Hedge@OutputDate

= Hedge@RelAcDate x HeRet(RelAcDate, OutputDate)

Cash@OutputDate

= Cash@RelAcDate x CaRet(RelAcDate, OutputDate)

Insurance@OutputDate

= Insurance@RelAcDate
x (50% x BoRet(RelAcDate, OutputDate)
+ 12.5% x UKRet(RelAcDate, OutputDate)
+ 12.5% x OSRet(RelAcDate, OutputDate)
+ 25% x CaRet(RelAcDate, OutputDate))

Commodities@OutputDate = Commodities@RelAcDate
x (50% x BoRet(RelAcDate, OutputDate)
+ 12.5% x UKRet(RelAcDate, OutputDate)
+ 12.5% x OSRet(RelAcDate, OutputDate)
+ 25% x CaRet(RelAcDate, OutputDate))

Other@OutputDate = Other@RelAcDate
x (50% x BoRet(RelAcDate, OutputDate)
+ 12.5% x UKRet(RelAcDate, OutputDate)
+ 12.5% x OSRet(RelAcDate, OutputDate)
+ 25% x CaRet(RelAcDate, OutputDate))

The asset return roll up factors are defined as follows:

<table>
<tr><th>Asset category (Xx)</th><th>Asset return roll up factor
XxRet(Date1, Date2)</th></tr>
<tr><td>Bo</td><td>FTSE UK Gilts All stocks TRI@Date2
÷ FTSE UK Gilts All stocks TRI@Date1</td></tr>
<tr><td>UK</td><td>FTSE All-Share TRI@Date2
÷ FTSE All-Share TRI@Date1</td></tr>
<tr><td>OS</td><td>FTSE All-World ex UK TRI@Date2[3]
÷ FTSE All-World ex UK TRI@Date1</td></tr>
<tr><td>Pr</td><td>When Date2 is not specified as the OutputDate of 31 March 2019, PrRet(Date1, Date2) is defined as follows:
<table>
<tr><td>FTSE All-Share TRI@Date2
÷ FTSE All-Share TRI@Date1</td><td>If Date1 and Date2 are both on or before 22 June 2006</td></tr>
<tr><td>(FTSE All-Share TRI@Date2
÷ FTSE All-Share TRI@22 June 2006)
x (FTSE All UK Property Gross TRI@22 June 2006
÷ FTSE All UK Property Gross TRI@Date1)</td><td>If Date1 is after 22 June 2006 and on or before 31 December 2014 and Date2 is on or before 22 June 2006</td></tr>
<tr><td>(FTSE All-Share TRI@Date2
÷ FTSE All-Share TRI@22 June 2006)
x (FTSE All UK Property Gross TRI@22 June 2006
÷ FTSE All UK Property Gross TRI@31 December 2014)
x (IPD UK Monthly Property TRI@31 December 2014
÷ IPD UK Monthly Property TRI@Date1)</td><td>If Date1 is after 31 December 2014 and Date2 is on or before 22 June 2006</td></tr>
<tr><td>(FTSE All-Share TRI@22 June 2006
÷ FTSE All-Share TRI@Date1)
x (FTSE All UK Property Gross TRI@Date2
÷ FTSE All UK Property Gross TRI@22 June 2006)</td><td>If Date1 is on or before 22 June 2006 and Date2 is after 22 June 2006 and on or before 31 December 2014</td></tr>
<tr><td>FTSE All UK Property Gross TRI@Date2
÷ FTSE All UK Property Gross TRI@Date1</td><td>If Date1 and Date2 are both after 22 June 2006 and on or before 31 December 2014</td></tr>
</table></td></tr>
</table>

[3] FTSE All-World ex UK TRI (Sterling denominated) to be used

(FTSE All UK Property Gross TRI@Date2 ÷ FTSE All UK Property Gross TRI@31 December 2014) x (IPD UK Monthly Property TRI@31 December 2014 ÷ IPD UK Monthly Property TRI@Date1)	If Date1 is after 31 December 2014 and Date2 is after 22 June 2006 and on or before 31 December 2014
(FTSE All-Share TRI@22 June 2006 ÷ FTSE All-Share TRI@Date1) x (FTSE All UK Property Gross TRI@31 December 2014 ÷ FTSE All UK Property Gross TRI@22 June 2006) x (IPD UK Monthly Property TRI@Date2 ÷ IPD UK Monthly Property TRI@31 December 2014)	If Date1 is on or before 22 June 2006 and Date2 is after 31 December 2014
(FTSE All UK Property Gross TRI@31 December 2014 ÷ FTSE All UK Property Gross TRI@Date1) x (IPD UK Monthly Property TRI@Date2 ÷ IPD UK Monthly Property TRI@31 December 2014)	If Date1 is after 22 June 2006 and on or before 31 December 2014 and Date2 is after 31 December 2014
IPD UK Monthly Property TRI@Date2 ÷ IPD UK Monthly Property TRI@Date1	If Date1 and Date2 are both after 31 December 2014

When Date2 is specified as the OutputDate of 31 March 2019, PrRet(Date1, OutputDate) is defined as follows:

The index value at Date2, the OutputDate, is smoothed by constructing the following five year series:

FTSE All UK Property Gross TRI@DateX	Where DateX is on or after 1 April 2013 and on or before 31 December 2014
FTSE All UK Property Gross TRI@31 December 2014 x (IPD UK Monthly Property TRI@DateX ÷ IPD UK Monthly Property TRI@31 December 2014)	Where DateX is on or after 1 January 2015 and on or before 31 March 2019

This series is then smoothed in line with subsection 4.1 above and divided by the denominator derived from the table below to give the property return roll up factor PrRet(Date1, OutputDate):

(FTSE All-Share TRI@Date1 ÷ FTSE All-Share TRI@22 June 2006) x FTSE All UK Property Gross TRI@22 June 2006	If Date1 is on or before 22 June 2006
FTSE All UK Property Gross TRI@Date1	If Date1 is after 22 June 2006 and on or before 31 December 2014
(IPD UK Monthly Property TRI@Date1 ÷ IPD UK Monthly Property TRI@31 December 2014) x FTSE All UK Property Gross TRI@31 December 2014	If Date1 is after 31 December 2014

Where reference is made to the IPD UK Monthly Property TRI:

- the IPD UK Monthly Property All Property TRI should be used for dates between 31 December 2014 and 29 June 2016 inclusive.
- the IPD UK Monthly Property All Assets TRI should be used for dates on or after 30 June 2016.

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FTSE All-Share TRI@Date2 ÷ FTSE All-Share TRI@Date1	If Date1 and Date2 are both on or before 1 June 2005
(FTSE All-Share TRI@Date2 ÷ FTSE All-Share TRI@1 June 2005) x (HFRX Global Hedge Fund GBP Index TRI@1 June 2005 ÷ HFRX Global Hedge Fund GBP Index TRI@Date1)	If Date1 is after 1 June 2005 and Date2 is on or before 1 June 2005
(FTSE All-Share TRI@1 June 2005 ÷ FTSE All-Share TRI@Date1) x (HFRX Global Hedge Fund GBP Index TRI@Date2 ÷ HFRX Global Hedge Fund GBP Index TRI@1 June 2005)	If Date1 is on or before 1 June 2005 and Date2 is after 1 June 2005
HFRX Global Hedge Fund GBP Index TRI@Date2 ÷ HFRX Global Hedge Fund GBP Index TRI@Date1	If Date1 and Date2 are both after 1 June 2005

Ca	Cash TRI@Date2 ÷ Cash TRI@Date1 where Cash TRI@DateX = 1 + Cashreturn%(BaseDate, DateX), Cashreturn% estimated by rolling up the Bank of England base rate from BaseDate to DateX, and BaseDate = 1 November 2004
When Date2 is specified as the OutputDate of 31 March 2019, the index values at Date2 are smoothed in line with subsection 4.1 above unless otherwise stated; otherwise, unsmoothed index values are used.	

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 excluding any ABC Arrangement, allowing for differential asset returns for each asset category over the period from AssetDate to RelAcDate. This is done using roll forward formulae consistent with those above. The asset distribution at RelAcDate for assets included in the accounts is then calculated by normalising the total to 100%. The adjustment for the field S179InputInsPpnAdj, to take account of annuities not listed in the relevant accounts, is made after the normalisation process. These normalised allocation percentages are then used in the formulae above to calculate the asset value at OutputDate.

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 excluding any ABC Arrangement, allowing for differential asset returns for each asset category over the period from 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 asset distribution at RelAcDate for assets included in the accounts is then calculated by normalising the total to 100%. The adjustment for the field S179InputInsPpnAdj, to take account of annuities not listed in the relevant accounts, is made after the normalisation process. These normalised allocation percentages are then used in the formulae above to calculate the asset value at OutputDate.

4.5 Application of Section 179 expenses

S179PayExp = £700 x PMemNo + £1,000 x (DMemNo + AMemNo)

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

S179WUExp = (S179PL + S179DL + S179AL) x 0.03

If £50million =< S179PL + S179DL + S179AL < £100 million, then

S179WUExp = (S179PL + S179DL + S179AL) x 0.02 + £0.5 million

If S179PL + S179DL + S179AL >= £100 million, then

S179WUExp = (S179PL + S179DL + S179AL) x 0.01 + £1.5 million

S179Exp = S179PayExp + S179WUExp

4.6 Total liability value on smoothed and stressed Section 179 basis

S179TL = S179PL + S179DL + S179AL + S179Exp + S179ExLiab

4.7 Total asset value on smoothed and stressed basis

In standard cases, where no bespoke stress analysis has been submitted:

S179Ass

= Go@OutputDate x (1 + GoStrFac) + NG@OutputDate x (1 + NGStrFac)
+ IL@OutputDate x (1 + ILStrFac) + UK@OutputDate x (1 + UKStrFac)
+ OS@OutputDate x (1 + OSStrFac) + PE@OutputDate x (1 + PEStrFac)
+ Prop@OutputDate x (1 + PrStrFac)
+ Insurance@OutputDate x (1 + InStrFac)
+ Annuities@OutputDate x (1 + AnStrFac) + Hedge@OutputDate x (1 + HeStrFac) + Cash@OutputDate x (1 + CaStrFac)
+ Commodities@OutputDate x (1 + CoStrFac)
+ Other@OutputDate x (1 + OtStrFac)

In cases where a bespoke stress analysis has been submitted:

- Adjust BespokeUnstr and BespokeStr to make allowance for assets held in the form of insurance contracts not included in Scheme accounts
- Use the ratio of these adjusted asset values to apply a bespoke stress factor

BespokeUnstrAdj = BespokeUnstr ÷ (100% - S179InputInsPpnAdj)

BespokeStrAdj =

BespokeStr + BespokeUnstrAdj x S179InputInsPpnAdj x (1 + AnStrFac)

S179Ass

= (Go@OutputDate + NG@OutputDate + IL@OutputDate
+ UK@OutputDate + OS@OutputDate + PE@OutputDate
+ Prop@OutputDate + Insurance@OutputDate + Annuities@OutputDate
+ Hedge@OutputDate + Cash@OutputDate + Commodities@OutputDate
+ Other@OutputDate)

x BespokeStrAdj ÷ BespokeUnstrAdj

4.8 Calculation of smoothed but unstressed asset and liability values

The calculation of the smoothed but unstressed asset and liability values follows the same transformation steps as set out above in subsections 4.1 to 4.7, with the application of the stress factors omitted (i.e. BespokeStrAdj ÷ BespokeUnstrAdj = 1, if applicable, and the stress factors specified in subsection 4.2 should be treated as if they were zero). In this scenario, the outputs S179Ass and S179TL would respectively represent the smoothed but unstressed asset and liability values.

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 and to service between 6 April 1997 and 5 April 2009 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 deferred pensioner liabilities, excluding expenses, relating to service between 6 April 1997 and 5 April 2009	S179InputD97_09Ppn	= 0.2
• Proportion of active member liabilities, excluding expenses, relating to service before 6 April 1997	S179InputAPre97Ppn	= 0.6
• Proportion of active member liabilities, excluding expenses, relating to service between 6 April 1997 and 5 April 2009	S179InputA97_09Ppn	= 0.4

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

5.5 Where the total of the percentages of the equities in each subcategory (UK% + OS% + PE%) is zero (or no breakdown is provided), UK% will be increased to give a total of 100%. Where the total of the percentages of the equities in each subcategory is less than 100% or greater than 100%, the percentages will be pro-rated so as to give an adjusted total equal to 100%.

5.6 If PMemNo + DMemNo + AMemNo = 0 but total membership number, TotMemNo, can be determined from another source then

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

5.7 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

5.8 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

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

5.10 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.

5.11 Where NPAPre97, NPA97_09 or NPAPost09 have not been provided, 63 will be used.

5.12 Where S179InputInsPpn has not been provided, 0 will be assumed.

6. Transformation of Deficit-Reduction Contributions and Contingent Asset valuations

6.1 Deficit-Reduction Contributions

The amount of any certified Deficit-Reduction Contributions used in the calculation of the RBL pursuant to Rule G1 of the Determination and the Deficit-Reduction Contributions Appendix is not subject to smoothing or stressing transformations.

6.2 Contingent Assets

The value of any secured assets underlying a Contingent Asset agreement used in the calculation of the RBL (pursuant to Rule G2 of the Determination and the Contingent Asset Appendix) shall be subject to smoothing and/or stressing transformations as set out below.

Only Type B(ii) Contingent Assets (real estate subject to a first priority legal mortgage or fixed charge in favour of the trustees of the Scheme) and Type B(iii) Contingent Assets (securities subject to a first priority legal mortgage or fixed charge in favour of the trustees of the Scheme) are subject to smoothing or stressing transformations with regard to the valuations of the secured assets underlying the agreement.

This section describes how the valuation of the real estate / the valuation of the securities, in each case as shown in the Contingent Asset Certificate, is transformed to reflect smoothing and stressing of market conditions for the purpose of calculating the Levies in respect of the 2019/20 Levy Year. The Contingent Asset Appendix provides detail on how Contingent Assets shall be taken into account for the purposes of calculating RBL under the Rules.

Smoothing

For Type B(ii) Contingent Assets, no smoothing adjustment is made to the valuation of the real estate as shown in the Contingent Asset Certificate.

For Type B(iii) Contingent Assets, the valuation of the securities as shown in the Contingent Asset Certificate is transformed to a smoothed value by multiplying by the following factor:

> (50% x BoRet(OutputDate, OutputDate) + 12.5% x UKRet(OutputDate, OutputDate) + 12.5% x OSRet(OutputDate, OutputDate) + 25% x CaRet(OutputDate, OutputDate))
>
> For the avoidance of doubt, the above asset return roll up factors are calculated as the ratio of the smoothed index value relative to the unsmoothed index value.

Stressing

For Type B(ii) Contingent Assets, the valuation of the real estate as shown in the Contingent Asset Certificate is transformed to a stressed value by multiplying by the following factor:

> (1+ PrStrFac)

For Type B(iii) Contingent Assets, the smoothed value of the securities as calculated above is transformed to a stressed value by multiplying by the following factor:

> (1 + OtStrFac)