

Guidance for bespoke investment risk calculation

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Part 1. Terminology

- 1.1 A **Bespoke Stress Calculation** is the PPF's terminology for the calculation of stressed asset values in accordance with our guidance. This calculation will be carried out by or on behalf of the scheme.
- 1.2 The results of the Bespoke Stress Calculation will need to be submitted as part of the annual Scheme Return, via Exchange. In order to use this in the levy calculation, schemes will need to supply the following information as at the effective date of the most recently available audited scheme accounts:
- a) Total asset value
 - b) Total stressed asset value

We will use these to calculate a stress factor (i.e. ratio of stressed value to unstressed asset value), which will be applied to the smoothed s179 value of assets.

- 1.3 A **standard stress** is a calculation carried out by the PPF based on information supplied by the scheme on Exchange in cases where a bespoke calculation is not necessary and has not been provided voluntarily.
- 1.4 **Exchange** is the Pensions Regulator's online scheme maintenance system, which schemes should use to notify us of their Bespoke Stress Calculation as part of the Scheme Return.
- 1.5 **Scheme Return** is the information that schemes are required by legislation to provide to the Pensions Regulator on an annual basis. The Bespoke Stress Calculation fields are a mandatory part of the Scheme Return for the largest schemes and an optional part for all other schemes.

Part 2. Overview of the Bespoke Stress Calculation process

The Board's objectives

- 2.1 The Board has the following objectives in respect of measuring investment risk:
- (a) to reflect the potential volatility of a scheme's investment strategy in the level of risk-based levy charged; and
 - (b) to give schemes that have adopted de-risking strategies the opportunity to obtain appropriate credit for these risk reduction measures.

What this Guidance covers

- 2.2 Schemes that have protected liabilities of £1.5 billion or more at their most recent section 179 valuation and must carry out a Bespoke Stress Calculation on a mandatory basis.
- 2.3 All other schemes may opt to carry out a Bespoke Stress Calculation on a voluntary basis.
- 2.4 This Guidance covers the process of carrying out and Submitting a Bespoke Stress Calculation for schemes in either scenario.
- 2.5 This guidance supplements the Levy Rules in the Determination and the Investment Risk Appendix and should be read in conjunction with those documents; in the event of any conflict between the Levy Rules as described in the Determination and the guidance, the Determination will take precedence.
- 2.6 This guidance does not cover the calculation of the standard stress which will be carried out by the PPF on behalf of schemes that are not required to and do not opt to carry out a Bespoke Stress Calculation. Where a scheme carries out a Bespoke Stress Calculation, it should not adjust the values to allow for smoothed market conditions as the PPF will perform this part of the levy calculation. For the same reason, no bespoke calculations are required in respect of the scheme liabilities. Please see the Determination for more information.
- 2.7 Guidance on the allocation of scheme investments between different asset categories (including a general description of the key characteristics of each asset category as well as some examples) is included in the "help file" accessible on Exchange (Asset Breakdown section of the Scheme Return). A copy of this help file is attached as an appendix to this guidance, although schemes are encouraged to refer to Exchange for the most up to date version.

2.8 Details on how the bespoke investment stress feeds into the levy calculation are covered in the Levy Rules in the Determination and the Transformation Appendix.

Why might you opt to carry out a Bespoke Stress Calculation?

- 2.9 All schemes will be allowed to submit a Bespoke Stress Calculation if they choose to do so; however the Board requires that all schemes with section 179 liabilities of £1.5 billion or more will submit this Bespoke Stress Calculation.
- 2.10 The standard stresses have been calibrated such that in aggregate, the broad risk profile of the universe of pension schemes covered by the PPF is captured.
- 2.11 The standard and bespoke stresses have been set so as to provide comparable results. Schemes are advised that using the bespoke approach is unlikely to provide for a reduced levy unless risk-reducing derivative strategies are in place.
- 2.12 Schemes with certain types of derivative exposure are encouraged to carry out a Bespoke Stress Calculation in order that the levy more accurately reflects the investment exposure of the scheme. Please refer to Part 5 for further guidance.
- 2.13 We expect that, once a scheme has chosen to submit bespoke results, it will be appropriate to continue to do so for future years, unless the investment strategy is significantly changed.

What does carrying out a Bespoke Stress Calculation involve?

- 2.14 There are three stages in the Bespoke Stress Calculation:
- For physical assets (i.e. non-derivative investments), a more refined set of asset stresses than the PPF standard stresses detailed at paragraph 4.2 of the Transformation Appendix will be applied to calculate an “initial stressed value of assets”. This stage is explained in more detail in Part 4.
 - For derivative positions (held either on a segregated basis or through pooled funds), schemes will be required to carry out risk factor stress calculations on those derivative positions. This stage is explained in more detail in Part 5.
 - The third stage is to combine the results of the risk factor stress analysis with the “initial stressed value of assets”.

What level of knowledge and expertise is required to carry out the Bespoke Stress Calculation?

- 2.15 A detailed understanding of the scheme’s investment strategy and the current asset allocation is needed to collate the appropriate information in order to carry out the refined asset stresses element of the Bespoke Stress Calculation, as described in Part 4.

- 2.16 Where derivative contracts are involved, Trustees should take advice from investment professionals who are, in the Trustees' opinion, appropriately qualified. We have provided guidance to help carry out these calculations in Parts 5 to 10.

What about the liability stress?

- 2.17 Liability stresses will be calculated by the PPF for all schemes based on the data supplied in Exchange. This calculation will be carried out in accordance with the Determination and appendices.

When should you carry out the Bespoke Stress Calculation?

- 2.18 The stressed and unstressed asset values need to be submitted as part of the annual Scheme Return, via Exchange, by the Scheme Return deadline (assigned individually to each scheme by the Pensions Regulator). All the calculations should be carried out as at the same effective date as the audited scheme accounts most recently available at the time the Scheme Return is submitted. The asset breakdown from these accounts is already required as part of the Scheme Return. The Bespoke Stress Calculation should be based on the same information and can be submitted at the same time.

How often should you carry out the Bespoke Stress Calculation?

- 2.19 The Scheme Return is an annual requirement and the Bespoke Stress Calculation should also be updated each year and recorded as part of this. The PPF will calculate levies based on information held on Exchange at the relevant Measurement Time. If more recent audited scheme accounts become available between the Scheme Return deadline, as assigned by the Pensions Regulator, and the Measurement Time, then schemes could choose to update the Bespoke Stress Calculation, provided Exchange is also updated in all respects to reflect the latest accounts (e.g. including the asset breakdown information).
- 2.20 In the following example, all dates are illustrative except for the Measurement Time.

Suppose:

- Scheme's accounting year end = 30 September
- Date 2010 scheme accounts signed off by the auditors = 31 March 2011
- Scheme Return deadline assigned to scheme by the Pensions Regulator = 31 January 2012
- Date 2011 scheme accounts signed off by the auditors = 28 February 2012
- Measurement Time for 2012/13 PPF Levy = 5pm, 30 March 2012

In this case, a Bespoke Stress Calculation should be done as at 30 September 2010, i.e. asset values and PV01 values etc should be measured as

at 30 September 2010. This would need to be submitted by 31 January 2012 as part of the Scheme Return. The scheme would have the option, at any time before the next Scheme Return deadline, to update the Bespoke Stress Calculation and the asset breakdown information on Exchange to reflect the latest audited scheme accounts. In this example, once the 2011 scheme accounts are signed off by the auditors on 28 February 2012, the scheme could submit a second Bespoke Stress Calculation as at 30 September 2011. If this second calculation is submitted on Exchange before 5pm, 30 March 2012 then it would be used in the 2012/13 PPF Levy; otherwise, the first Bespoke Stress Calculation as at 30 September 2010 will be used.

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Part 3. Sources of information

What information do you need to carry out the Bespoke Stress Calculation?

- 3.3 The Bespoke Stress Calculation should be carried out as at the same effective date as the most recently available audited scheme accounts. Asset values and exposures should be taken from information in the most recently available audited scheme accounts.
- 3.4 If the scheme accounts do not contain sufficiently detailed information on the exposure to different asset categories then more detailed information, particularly for multi asset funds and derivative contracts, may need to be provided by asset managers.
- 3.5 Although the asset allocation should be taken from the scheme accounts rather than from the Statement of Investment Principles, the scheme's latest Statement of Investment Principles may contain information on investment benchmarks which may help map the scheme's investments to the appropriate refined asset stress.
- 3.6 For derivative positions, risk factor sensitivity information should be available from asset managers, either as part of regular reporting or on request. This information should be collected as at the same effective date as the asset valuation (i.e. latest audited scheme accounts date).

Part 4. Asset stresses

- 4.1 The PPF recognises that schemes may have different investment benchmarks to the ones associated with the standard stresses.
- 4.2 The PPF is therefore providing a refined set of asset stresses that schemes can use to calculate and submit their own stressed valuation if they believe they provide a closer match to the characteristics of the particular assets held by the scheme. A refined set of asset stresses is provided for equities and bond investments. For all other asset classes it is not practical to divide the categories into greater granularity, so the asset stresses used under the bespoke approach are the same as under the standard approach.
- 4.3 The asset classes used in the Bespoke Stress Calculation are a refinement of those used in Exchange. Guidance on the allocation of scheme investments between different asset categories is included in the “help file” accessible on Exchange (Asset Breakdown section of the Scheme Return). A copy of this help file is attached as an appendix to this guidance, although schemes are encouraged to refer to Exchange for the most up to date version. This guidance remains relevant in the Bespoke Stress Calculation. A general description of the key characteristics of each asset category in Exchange has been provided. Where a scheme has assets that do not obviously fall into any of these categories, the pension scheme, perhaps in conjunction with their investment advisor or asset manager, can apply judgment as to which category best reflects that asset’s characteristics – this may involve dividing the asset amongst more than one category.
- 4.4 For equities and bond investments, portfolios should be mapped to one or more of the refined asset stresses. Generally the scheme’s investment consultant and/or asset manager should be able to apply professional judgment to advise how a portfolio should be broken down and which of the asset stresses are appropriate to each subset. Some general guidance is provided below.

Equities

- 4.5 For equity investments, there is an additional asset stress for Emerging Markets. Allocations to Emerging Market equities are normally separately identified within the Statement of Investment Principles and would normally be included in “Overseas equities” for Exchange purposes. For the Bespoke Stress Calculation, Trustees are required to strip out the allocation to Emerging Markets from the rest of the portfolio of overseas equities.
- 4.6 If there is uncertainty over the definition of which countries are to be considered as Emerging Market, then schemes should refer to the classifications adopted by MSCI in its Global Equity Indices. See <http://www.msci.com/products/indices/> Those countries classified as being emerging markets or frontier markets by

MSCI should be treated as Emerging Market for the purposes of the Bespoke Stress Calculation.

Bonds

- 4.7 The main characteristic to identify the most appropriate stress for a bond portfolio (or subset) will be its “maturity”. Maturity is a measure of the length of time until the bonds in the portfolio make their final payment. Fixed interest government bond, fixed interest non-government bond and inflation-linked bond portfolios should be split into subsets based on maturity (as per Table 1 below). Fixed interest bonds issued by overseas governments, including Emerging Markets governments, should be treated as fixed interest government bonds.
- 4.8 For fixed interest non-government bonds, portfolios should also be split into subsets according to whether the bonds are UK or overseas and investment or sub-investment grade. Sub-investment grade is often also called “high yield” and this category groups bonds rated BB+ or below by Standard & Poor’s or Fitch Ratings or rated Ba1 or below by Moody’s Investors Service.

Currency Hedging

- 4.9 Pension schemes adopt a wide range of currency hedging strategies, both within and across asset classes. The stresses have been derived assuming that for each asset class the level of currency hedging (if any) is fixed.
- 4.10 Schemes are not expected, or able, to reflect their specific approach to currency hedging.

LDI Strategies

- 4.11 An LDI strategy may consist of a cash and derivative strategy or a bond portfolio tailored to the scheme’s liability cashflow pattern, or a combination thereof. A buy-in insurance policy may also be treated in a similar way to an LDI strategy. If a scheme has adopted an LDI strategy, then there are two approaches that can be taken, depending on how much data is available from the asset manager. The second approach is likely to be the simpler method and we expect most asset managers should be able to provide the necessary information.

Option 1: The strategy can be treated as a combination of physical assets and derivatives (with the asset stresses applied to the cash and bond components, and the risk stresses applied to the derivatives). This relies upon the asset manager being able to separately identify the components.

Option 2: The asset manager may be able to provide interest rate (“PV01”) and inflation (“IE01”) sensitivities for all the assets within the LDI strategy, in which case all elements could be assessed together in

line with Parts 7 and 8 of this document. Option 2 should not be used if non-government bonds are included in the LDI strategy.

4.12 Care should be taken not to double count the stress applied as a result of taking a mixed approach.

Table 1 Asset stresses

Asset class	Asset class description	Maturity	Asset stress
Equities	UK quoted equities	N/A	-22%
Equities	Overseas developed market quoted equities	N/A	-16%
Equities	Emerging market quoted equities	N/A	-21%
Equities	Unquoted/private equity	N/A	-22%
Property	Property	N/A	-6%
Hedge funds	Hedge funds	N/A	-7%
Commodities	Commodities	N/A	-16%
Fixed interest government bonds	Short maturity	0 to 5 years	+2%
Fixed interest government bonds	Medium maturity	5 to 15 years	+4%
Fixed interest government bonds	Long maturity	Over 15 years	+10%
Inflation-linked bonds	Short maturity	0 to 5 years	+2%
Inflation-linked bonds	Medium maturity	5 to 15 years	+8%
Inflation-linked bonds	Long maturity	Over 15 years	+22%
Fixed interest non-government bonds	UK short- and medium-dated investment grade	0 to 15 years	+0%
Fixed interest non-government bonds	UK long-dated investment grade	Over 15 years	+3%
Fixed interest non-government bonds	Overseas short- and medium-dated investment grade	0 to 10 years	+0%
Fixed interest non-government bonds	Overseas long-dated investment grade	Over 10 years	+2%

Asset class	Asset class description	Maturity	Asset stress
Fixed interest non-government bonds	Global sub-investment grade	All maturities	-5%
Cash and net current assets	Cash and net current assets	N/A	0%
Annuities	Annuities	N/A	+16%
Insurance Funds ¹	Insurance Funds	N/A	-22%
Other	Other	N/A	-22%

Future developments in pension scheme investment strategies

4.13 The investment strategies adopted by pension schemes will be kept under review and further guidance may be issued if developments in strategies require additional clarification. Current trends being kept under review by the PPF include:

4.14 Trigger-based investment strategies

4.14.1 A recent trend in pension scheme investment strategies has been the development of trigger-based investment strategies whereby pension schemes set market or scheme funding levels at which they envisage making changes to strategic asset allocations.

4.14.2 Where such mechanisms are written into asset manager documentation, we would expect schemes to consider how they interact with our stress factors; however such strategies tend to target “de-risking” in situations where funding levels improve, which are opposite to the scenarios being assessed through stress analysis.

4.15 Special Purpose Vehicles

4.15.1 Some companies have provided investments to their pension schemes via Special Purpose Vehicles that provide security to the pension scheme over a future stream of income related to assets on the company’s balance sheet.

4.15.2 Such strategies are distinct from contingent assets as their payment is not purely contingent on a future insolvency event and also their value is likely to be reflected as an asset in the pension scheme’s report and accounts.

¹ To the extent that this cannot be broken down into component asset classes (see Exchange Help File)

- 4.15.3 The impact of the stresses on such assets will depend ultimately on the way in which the value is determined and the unique nature of each solution makes it difficult for general guidance to be given. However, such valuations may include an element of discounted cashflow in which case it may be reasonable to use the interest rate, inflation and credit risk stress factors.
- 4.15.4 We expect schemes with such investments will ask their advisors to adopt an approach that reflects the spirit of this guidance and that best gives effect to the approach set out in the Levy Rules, the Investment Risk Appendix and this guidance. For example if the Special Purpose Vehicle is a wrapper for equities it should be treated in the same way as the underlying equities would be.

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Part 5. Risk factor stresses

What are risk factor stresses for?

- 5.1 There are a range of derivatives that schemes may buy or sell that alter their risk exposure such that analysis limited to physical assets would not accurately reflect the risks in the investment strategy. The risk factors form the building blocks from which the asset stresses in Part 4 have been derived. In the case of physical asset categories the sensitivity to each risk factor is well defined so asset stresses can be derived; however, for derivative positions the sensitivity to each risk factor could vary widely so asset stresses are not provided.
- 5.2 Schemes that have derivatives in their portfolio will need to carry out additional analysis of the impact of risk factor stresses on their derivative positions after applying the refined asset stresses to all non-derivative investments.
- 5.3 Some asset managers whose mandate principally covers the investment of physical assets may have some freedom to employ small short-term derivative positions from time to time as part of their efficient portfolio management. In these cases, schemes should be able to use the asset stress methodology described in Part 4 above, rather than using the risk factor stresses. Where a breakdown by asset class is required, this should reflect the effective economic exposures of the portfolio (as indicated in the manager's regular reporting).

How do I determine whether my scheme has derivatives?

- 5.4 Reference to derivatives is only intended to capture the use of derivatives as an explicit part of the Trustees' long-term investment strategy (e.g. as documented in the scheme's Statement of Investment Principles or within the investment mandate given to asset managers). This can be either as a segregated holding or within pooled funds.
- 5.5 Reference to derivatives is not intended to refer to short-term derivative positions. Where there is an intention that a derivative position will be unwound, and not rolled over, within six months, no allowance should be made. Similarly no allowance should be made where derivatives are used by asset managers for efficient management of their portfolios and therefore form only an implicit part of the investments.
- 5.6 If the answer to any of the questions in this section is "Yes", then the scheme should be treated as having derivative strategies and will be required to carry out risk factor stress analysis (if carrying out the bespoke investment stress). Derivative positions can either be held on a segregated basis or through pooled funds. The questions set out in this section are non-exhaustive; schemes should consider whether any other relevant considerations apply.

- 5.7 The scheme's investment advisor and/or asset manager will be able to advise if such investments are held by the scheme. They may also be best placed to carry out the stress calculations on behalf of the scheme; however if the scheme wishes to calculate the stresses themselves, we provide further guidance and some worked examples in Parts 6 to 10.

1. Does your scheme have investment in any of the following equity derivative strategies?

An equity derivative strategy is one where the scheme has entered into a contract with another party to pay or receive a series of payments (or one single payment) whose amounts are determined by the future movement of equity markets.

Example equity derivative strategies:

Equity futures or forward contracts: These contracts promise to pay the holder the return on an equity index (e.g. FTSE 100, or S&P 500) or an individual share.

Equity total return swaps: These contracts promise to pay the contract holder the total return on an equity index (e.g. FTSE 100 or S&P 500) in return for a series of payments from the contract holder to the counterparty.

Equity options: These contracts give the buyer the right, but not the obligation, to buy (or sell) some equities at a particular strike price. These contracts are typically used to protect the scheme from equity markets falling below a certain level, in return for paying an upfront premium (e.g. a "put option" or "put spread"). In some cases, schemes may also have agreed to limit their gain from rising equity markets, in return for receiving an upfront premium (e.g. a "call option" or "call spread"). Most other commonly used option strategies are typically combinations of buying or selling put or call options (e.g. "put collar").

2. Does your scheme have any direct investment in interest rate derivative strategies?

An interest rate derivative strategy is one where the scheme has entered into a contract with another party to pay or receive a series of payments (or one single payment) whose amounts are determined by the future movement of interest rates. They are a common component of "LDI" investment strategies. They typically consist of interest rate swaps and protect the scheme's funding level volatility from interest rate movements. Some schemes may enter these contracts directly with counterparties, or they can be done through pooled funds – often called "LDI" pooled funds.

As well as swaps, these strategies could include swaptions, gilt repos or gilt total return swaps.

If you have these strategies, you will need either to request the stress calculation from the asset manager/investment consultant or carry out the calculation yourself with some information from the asset manager. In the latter case you should ask your asset manager for the "PV01" (also known as "DV01") of the portfolio, i.e. the sensitivity of the portfolio value to a one basis point (or 0.01 per cent) change in interest rates at all durations. The market standard for calculating "PV01" is to use the spot rate curve, however, if it is not available you may use the par rate curve.

3. Does your scheme have any direct investment in inflation derivative strategies?

An inflation derivative strategy is one where the scheme has entered into a contract with another party to pay or receive a series of payments (or one single payment) whose amounts are determined, in whole or part, by the future movement of inflation rates. They are a common component of "LDI" investment strategies. They typically include inflation swaps and protect the scheme's funding level volatility from changes in inflation. Some schemes may enter these contracts directly with counterparties, or they can be done through pooled funds – often called "LDI" pooled funds.

If you have these strategies, you will either need to request the stress calculation from the asset manager/investment consultant or carry out the calculation yourself with some information from the asset manager. In the latter case you should ask your asset manager for the "PV01" and "IE01" of the portfolio, i.e. the sensitivity of the portfolio value to a one basis point (or 0.01 per cent) change in interest rates and inflation respectively².

4. Does your scheme have any direct investment in credit derivatives?

A credit derivative strategy is one where the scheme has entered into a contract with another party to pay or receive a series of payments (or one single payment) whose amounts are determined by the future movement of credit spreads or a credit event. The most common credit derivative is a credit default swap where the scheme has agreed to make a series of payments to buy or sell protection against the default of a corporate bond or corporate loan. They are commonly used by pension schemes to manage sizeable exposures to corporate bond/loan issuers or to mitigate the risk of sponsor insolvency.

If you have these strategies, you will either need to request the stress calculation from the asset manager/investment consultant or carry out the calculation yourself with some information from the asset manager. In the latter case you should ask your asset manager for the "CDD01" of the portfolio, i.e.

² Although the primary risk factor within inflation swaps will be inflation risk, the market value of the swaps contract will also have sensitivity to interest rates. On day 1, this sensitivity will be zero (for an unfunded swap).

the sensitivity of the portfolio value to a one basis point (or 0.01 per cent) change in credit spreads.

Risk factor stresses

5.8 The risk factor stresses are set out in the Table 2 below. It should be noted that the interest rate and inflation risk factor stresses are applicable to par or spot swaps rates as well as government bond yields.

Table 2 Risk Factor Stresses

Credit	Interest rates	Inflation	UK Equity	Non-UK Developed Equity	Emerging Market Equity
+49bps	-61bps	+34bps	-22%	-16%	-21%

Applying risk factor stresses to derivative strategies

5.9 There are numerous derivative strategies that are available to schemes in both segregated and pooled format and it is not practical to provide an exhaustive list of strategies. As noted earlier, investment consultants or asset managers will be able to assist schemes in determining whether such strategies are in place. We expect that the examples in Parts 6 to 9 will cover most common strategies used by pension schemes:

- Equity futures
- Equity total return swaps
- Equity options
- Fixed income futures
- Gilt futures
- Gilt total return swaps
- Gilt repos
- Interest rate swaps (typical component of an “LDI” strategy)
- Inflation swaps (typical component of an “LDI” strategy)
- Interest rate swaptions
- Credit default swaps

5.10 The underlying principle to be applied is that the stress calculation should reflect only the change in intrinsic value³ for any option contract; and for any other derivative, the standard measures of risk factor sensitivity applicable to that

³ The intrinsic value of an option is the value that would be realised if the option expired immediately. The market value also takes into account the time value of the option arising from potential changes in intrinsic value between the valuation date and actual future expiry date. The time value is primarily driven by the volatility of the underlying instrument. For the holder of an option, the intrinsic value is typically lower than the market value.

strategy (e.g. PV01, IE01, CDD01). Examples A – D in Parts 6 – 10 below relate to some of the more common types of derivative contracts that are used by pension schemes in the UK. Should a scheme's specific approach to derivatives not be captured by the examples, that scheme should ask its investment consultant or asset manager to apply the risk factor stresses in a consistent way by considering the overall economic exposure of the pension scheme.

- 5.11 Where strategies are exposed to more than one risk factor, the impact should be assessed separately and aggregated.
- 5.12 There are three stages in the Bespoke Stress Calculation:
- (a) Stage 1, covered in part 4 of this guidance, is to calculate the initial stressed value of assets (before adjusting for any derivative stress).
 - (b) Stage 2 is to apply risk factor stresses to the derivative positions.
 - (c) Stage 3 is to aggregate the results of Stage 1 and Stage 2. See the example in Part 10.
- 5.13 The initial stressed value of assets calculated in Stage 1 should include the unstressed market value of the derivatives – which can be positive or negative – as well as taking into account all related liabilities e.g. any premiums due to be paid (the value should be as included in the most recently available audited scheme accounts). No asset stresses should be applied to the derivative market values when calculating the initial stressed value of assets.

Part 6. Equity derivatives

Equity futures

The stress on an equity futures position is the notional exposure of the futures position, multiplied by the relevant equity risk factor stress. The calculation may need to be carried out more than once to reflect whether the position is capturing UK equity, non-UK developed markets (i.e. overseas markets) equity or emerging market equity risk.

Input parameters

Calculation date	<i>Effective date of the most recently available audited scheme accounts</i>
Notional exposure of futures position at the calculation date	<i>N</i>
Equity risk factor stress (note this is different for UK, non-UK developed and emerging markets)	<i>d_equity</i>

Notional exposure is defined to be the economic exposure of the position at the date of inception, adjusted in line with the relevant equity index return from the date of inception to the calculation date.

Calculations

The impact of the stress on the portfolio = $N \times d_equity$

This amount should be added to the initial stressed value of assets, so that if a scheme holds:

- a long position, the overall asset value is reduced;
- a short position, the overall asset value is increased.

Equity forward contracts and equity total return swaps can be valued in a similar way to equity futures.

Equity option

The stress on the equity option is the change in the intrinsic value of the option as a result of applying the appropriate stress to the underlying equity index. The calculation is set out below and should be carried out separately for each option that the scheme has.

Input parameters

Calculation date	<i>Effective date of the most recently available audited scheme accounts</i>
Strike price of option	<i>S</i>
Level of the underlying index at the calculation date	<i>P</i>
Notional option exposure at the calculation date	<i>E</i>
Equity risk factor stress (note this is different for UK, non-UK developed and emerging markets)	<i>d_equity</i>

Notional exposure is defined to be the economic exposure of the position at the date of inception, adjusted in line with the relevant equity index return from the date of inception to the calculation date.

Calculation of intrinsic values and stress impacts

A. Equity put option

1. Calculate current intrinsic value

$$\text{Value}_I = \max [0, E \times (S - P) \div P]$$
2. Calculate stressed level of index

$$P_{\text{stress}} = P \times (1 + d_{\text{equity}})$$
3. Calculate stressed intrinsic value of option

$$\text{Value}_S = \max [0, E \times (S - P_{\text{stress}}) \div P]$$
4. Calculate stress impact to apply

$$\text{Equity}_{\text{stress}} = \text{Value}_S - \text{Value}_I$$

B. Equity call option

1. Calculate current intrinsic value option

$$\text{Value}_I = \max [0, E \times (P - S) \div P]$$
2. Calculate stressed level of index

$$P_{\text{stress}} = P \times (1 + d_{\text{equity}})$$
3. Calculate stressed intrinsic value of option

$$\text{Value}_S = \max [0, E \times (P_{\text{stress}} - S) \div P]$$
4. Calculate stress impact to apply

$$\text{Equity}_{\text{stress}} = \text{Value}_S - \text{Value}_I$$

Adjustment to be applied to initial stressed value of assets

If the scheme has bought the option, the $\text{Equity}_{\text{stress}}$ should be added to the overall asset value.

If the scheme has sold the option, the Equity_stress should be subtracted from the overall asset value.

So the impact on the overall stressed value of assets will be as follows:

- increase for put option bought
- decrease for put option sold
- decrease for call option bought
- increase for call option sold (We would expect this to be an unusual position for a pension scheme to take unless in combination with other equity options that are bought.)

The vast majority of equity option-based strategies can be deconstructed into a number of the above component parts. For example, a zero cost collar is made up of buying a put option and selling a call option (at different strike prices). A put spread is a combination of buying a put option and selling another put option at a different strike price. Each element of these should be valued separately and the stresses added together.

Example A – Equity options

A pension fund has the following positions as at its latest audited scheme accounts date:

A) It holds an unexpired put option that it bought on the UK FTSE 100 Index with a strike price of 3,800 and notional exposure of £100m.

B) It has sold an unexpired call option on the US S&P 500 Index with a strike price of 550 and notional exposure of £75m.

At the latest audited scheme accounts date, the initial stressed value of the fund's assets (after applying the refined asset stresses to the fund's non-derivative investments and including the unstressed market value of the options) is £500m and the levels of the UK FTSE 100 Index and US S&P 500 Index are 3,926 and 798 respectively. It has no other derivative strategies.

Calculations

A. Intrinsic value of put option on UK FTSE 100 Index

$$\begin{aligned} S &= 3,800 \\ P &= 3,926 \\ E &= \text{£}100\text{m} \\ d_{\text{equity}} &= -22\% \end{aligned}$$

$$\begin{aligned} 1. \text{ Value}_I &= \max [0, E \times (S - P) \div P] \\ &= \max [0, \text{£}100\text{m} \times (3,800 - 3,926) \div 3,926] \\ &= \text{£}0\text{m} \end{aligned}$$

$$\begin{aligned} 2. P_{\text{stress}} &= P \times (1 + d_{\text{equity}}) = 3,926 \times (1 - 22\%) \\ &= 3,062 \end{aligned}$$

$$\begin{aligned} 3. \text{Value}_S &= \max [0, E \times (S - P_{\text{stress}}) \div P] \\ &= \max [0, \text{£}100\text{m} \times (3,800 - 3,062) \div 3,926] \\ &= \text{£}19\text{m} \end{aligned}$$

$$\begin{aligned} 4. \text{Equity}_{\text{stress}} &= \text{Value}_S - \text{Value}_I \\ &= \text{£}19\text{m} - \text{£}0\text{m} = \text{£}19\text{m} \end{aligned}$$

B. Intrinsic value of call option on US S&P 500 Index

$$\begin{aligned} S &= 550 \\ P &= 798 \\ E &= \text{£}75\text{m} \\ d_{\text{equity}} &= -16\% \end{aligned}$$

$$\begin{aligned} 1. \text{Value}_I &= \max [0, E \times (P - S) \div P] \\ &= \max [0, \text{£}75\text{m} \times (798 - 550) \div 798] \\ &= \text{£}23\text{m} \end{aligned}$$

$$\begin{aligned} 2. P_{\text{stress}} &= P \times (1 + d_{\text{equity}}) \\ &= 798 \times (1 - 16\%) \\ &= 670 \end{aligned}$$

$$\begin{aligned} 3. \text{Value}_S &= \max [0, E \times (P_{\text{stress}} - S) \div P] \\ &= \max [0, \text{£}75\text{m} \times (670 - 550) \div 798] \\ &= \text{£}11\text{m} \end{aligned}$$

$$\begin{aligned} 4. \text{Equity}_{\text{stress}} &= \text{Value}_S - \text{Value}_I \\ &= \text{£}11\text{m} - \text{£}23\text{m} = -\text{£}12\text{m} \end{aligned}$$

C. Overall stressed asset value

$$\begin{aligned} &= \text{Initial stressed value of assets} + \text{Equity}_{\text{stress}} (\text{put option bought}) - \text{Equity}_{\text{stress}} (\text{call option sold}) \\ &= \text{£}500\text{m} + \text{£}19\text{m} - (-\text{£}12\text{m}) \\ &= \text{£}531\text{m} \end{aligned}$$

Part 7. Interest rate derivatives

The most common interest rate derivatives used by pension funds in the UK are swaps contracts. These can be held in either segregated or pooled format, the latter commonly described as “LDI”.

Some schemes may also use gilt repos, gilt futures, gilt total return swaps or interest rate swaption strategies, which will typically be on a segregated basis.

The stress calculation quantifies the change in the value of the derivative contract associated with the interest rate risk factor stress.

Swaps contracts

Swaps contracts are between two parties – one pays a floating interest rate, the other pays a fixed interest rate. It is most typical for pension funds (or pooled funds on their behalf) to enter into contracts where they are receiving a fixed interest rate from the counterparty (and hence paying the floating interest rate).

Input parameters

Calculation date	<i>Effective date of the most recently available audited scheme accounts</i>
PV01 of the portfolio at the calculation date	<i>PV01</i>
This can be obtained from the asset manager. This is the sensitivity of the portfolio value to a one basis point (or 0.01 per cent) change in interest rates.	
Interest rate risk factor stress	<i>d_rates (basis points)</i>

Calculations

The impact of the interest rate stress on portfolio is $PV01 \times d_rates$

Typically, pension funds (or pooled funds on their behalf) will be receiving the fixed leg of an interest rate swap, in which case the absolute value of the stress impact should be added to the overall asset value.

If the fund (or pooled fund on its behalf) is paying the fixed leg of an interest rate swap, the absolute value of the stress impact should be deducted from the overall asset value.

Scheme/Pooled fund position

Receive fixed, pay floating
Receive floating, pay fixed

Effect on overall stressed asset value

Add absolute value of interest rate stress
Deduct absolute value of interest rate stress

Swaptions contracts

Interest rate swaptions are options to enter into a swaps contract at some defined point in the future. A pension fund can either be the buyer or seller of the option and can be either paying or receiving the fixed interest rate on the resulting swaps contract.

Interest rate swaptions are complex instruments and the intrinsic value of a swaption requires schemes both to have an assessment of the market's expectation of the future evolution of interest rates as well as the ability to carry out a theoretical swap valuation. Both these pieces of information are difficult to define in generality.

The number of schemes with swaptions strategies is currently anticipated to be extremely low and any such schemes would be expected to have the governance or ability to have specific stress analysis carried out by their asset manager or investment consultant. Such schemes should ask their asset manager or investment consultant to assist with the calculation.

Asset managers and investment consultants should note that:

- The interest rate risk factor is a parallel shift in the spot rate curve. For swaption calculations, in theory the equivalent impact on the forward rates would need to be assessed. But applying the same parallel shift to the forward rate curve is a reasonable approximation.
- Non-zero intrinsic values will only occur when the swaption is in-the-money.⁴ The intrinsic value in these cases will be the value of the swap contract assuming the swaption expires immediately and that the swap rate is the forward rate.

Gilt derivatives

Gilt derivatives include gilt repos, gilt futures and gilt total return swaps. Pension schemes may hold these instruments to give them synthetic exposure to the underlying gilts. The calculation of the stress is similar to that for swaps. We would expect pension schemes to be the holders of these instruments, rather than the seller.

Input parameters

⁴ A receiver-swaption is in-the-money if the forward rate of the underlying swap at the maturity of the option is lower than the strike-rate of the swaption. A payer-swaption is in-the-money if the forward rate of the underlying swap at the maturity of the option is greater than the strike-rate of the swaption.

Calculation date	<i>Effective date of the most recently available audited scheme accounts</i>
PV01 of the portfolio at the calculation date	<i>PV01</i>
This can be obtained from the asset manager. This is the sensitivity of the portfolio value to a one basis point (or 0.01 per cent) change in interest rates.	
Interest rate risk factor stress	<i>d_rates (basis points)</i>

Calculations

The impact of the interest rate stress on portfolio is $PV01 \times d_rates$

Where the synthetic exposure is a long position in gilts, the stress calculation would have the effect of increasing the overall stressed asset value, and vice versa.

Example B – Interest rate swaps

A pension fund has £5m notional of interest rate swaps, in which it is paying floating rate and receiving fixed rate. The total initial stressed value of the pension fund’s assets (after applying the refined asset stresses to the fund’s non-derivative investments and including the market value of the swaps) at the latest audited scheme accounts date is £25m. The fund has no other derivative contracts.

The asset manager has provided the following information on the contract as at the latest audited scheme accounts date:

Market value = £265,204
 PV01 = -£14,761

The risk factor stress from Table 2 is:

d_rates = -61bps

Calculations

Impact of the interest rate stress (IRSV) = $PV01 \times d_rates$
 = $-£14,761 \times -61$
 = £900,421

The absolute value of this stress is added to the initial stressed value of assets as the fund is receiving fixed rate payments.

Overall stressed asset value = Initial stressed value + absolute value of IRSV
 = £25m + £900,421
 = £25,900,421

Part 8. Inflation derivatives

The stress calculation quantifies the change in the value of the derivative associated with the inflation risk factor stress.

In addition, although the primary sensitivity of the derivative will be to inflation, over time the derivative will increase or decrease in value, such that its market value on any particular day will not be zero. To the extent the market value is non-zero, inflation derivatives will also have sensitivity to interest rate risk.

The inflation risk factor and interest rate risk factor stresses will be applied independently of each other. A more accurate calculation could be considered by applying the inflation risk factor stress first and then applying the interest rate risk factor stress to the stressed value of the derivative contract. We are not proposing this more complex approach because the PV01 and IE01 data provided by the asset manager will only reflect the market conditions at the specific date.

Input parameters

Calculation date	<i>Effective date of the most recently available audited scheme accounts</i>
IE01 of the portfolio at the calculation date This can be obtained from the asset manager. This is the sensitivity of the portfolio value to a one basis point (or 0.01 per cent) change in inflation.	<i>IE01</i>
PV01 of the portfolio at the calculation date This can be obtained from the asset manager. This is the sensitivity of the portfolio value to a one basis point (or 0.01 per cent) change in interest rates.	<i>PV01</i>
Market value of inflation swaps contract	<i>Value</i>
Inflation risk factor stress	<i>d_inf (basis points)</i>
Interest rate risk factor stress	<i>d_rates (basis points)</i>

Calculations

The impact of inflation stress (ISV) is $IE01 \times d_inf$

The impact of interest rate stress (IRSV) is $PV01 \times d_rates$

Step 1: Applying the inflation stress

Typically, pension funds (or pooled funds on their behalf) will enter inflation swaps as the receiver of the inflation linked payments. In this case, the absolute value of the inflation stress should be **added** to the overall stressed asset value.

If the fund (or pooled fund on its behalf) is paying inflation-linked payments, the absolute value of the inflation stress impact should be **deducted** from the overall stressed asset value.

Step 2: Applying the interest rate stress

If the market value of the inflation swaps contract is positive, the absolute value of the interest rate stress impact should be **added** to the overall stressed asset value.

If the market value of the inflation swaps contract is negative, the absolute value of the interest rate stress impact should be **deducted** from the overall stressed asset value.

Scheme or pooled fund position	Market value of inflation swap	Effect on overall stressed asset value
Receive inflation, pay fixed	Negative	1) Add absolute value of ISV 2) Deduct absolute value of IRSV
Receive inflation, pay fixed	Positive	1) Add absolute value of ISV 2) Add absolute value of IRSV
Receive fixed, pay inflation	Negative	1) Deduct absolute value of ISV 2) Deduct absolute value of IRSV
Receive fixed, pay inflation	Positive	1) Deduct absolute value of ISV 2) Add absolute value of IRSV

Example C – Inflation swaps

A pension fund has £5m notional of inflation swaps in a pooled fund. On behalf of the pension fund, the pooled fund manager is paying fixed rate and receiving inflation. The total initial stressed value of the pension fund's assets (after applying the refined asset stresses to the fund's non-derivative investments and including the market value of the swaps) at the latest audited scheme accounts date is £13m. The fund has no other derivative contracts.

The pooled fund manager has provided the following information on the inflation swaps contract as at the latest audited scheme accounts date:

Market value	= -£250,908
IE01	= £12,643
PV01	= £908

The risk factor stresses from table 2 are:

$$d_inf = +34\text{bps}$$

$$d_rates = -61\text{bps}$$

Calculations

$$\begin{aligned} \text{Calculate Inflation stressed value (ISV)} &= \text{IE01} \times d_inf \\ &= £12,643 \times 34 \\ &= £429,862 \end{aligned}$$

$$\begin{aligned} \text{Calculate Interest rate stressed value (IRSV)} &= \text{PV01} \times d_rates \\ &= £908 \times -61 \\ &= -£55,388 \end{aligned}$$

Step 1: Applying the inflation stress

The absolute value of ISV is added to the overall stressed asset value as the fund is receiving inflation-linked payments.

Step 2: Applying the interest rate stress

As the market value of the swap is negative, the absolute value of IRSV is deducted from the overall stressed asset value.

Overall stressed asset value

$$\begin{aligned} &= \text{Initial stressed value of assets} + \text{absolute value of ISV} - \text{absolute value of IRSV} \\ &= £13\text{m} + £429,862 - (£55,388) \\ &= £13,374,474 \end{aligned}$$

Part 9. Credit derivatives

The stress calculation quantifies the change in the value of a derivative associated with the credit risk factor stress.

Input parameters

Calculation date	<i>Effective date of the most recently available audited scheme accounts</i>
CDD01 of the portfolio at the calculation date	<i>CDD01</i>
This can be obtained from the asset manager. This is the sensitivity of the portfolio value to a one basis point change in credit spreads.	
Credit risk factor stress	<i>d_credit (basis points)</i> e.g. +49 from Table 2

Calculations

The impact of credit stress on the portfolio $CDD01 \times d_credit$

If the scheme has bought credit protection, the absolute value of the impact of the stress should be added to the overall asset value.

If the scheme has sold credit protection, the absolute value of the impact of the stress should be subtracted from the overall asset value.

Part 10. Bespoke Stress Calculation - Example

Example D – Portfolio with physical and derivative assets

A pension fund has £1,230m of assets broken down as follows as at its latest audited scheme accounts date:

UK equities	£200m
Emerging market equities	£100m
Overseas investment grade corporate bonds	£200m
UK long-dated investment grade corporate bonds	£100m
Medium maturity index-linked gilts	£200m
Very long maturity index-linked gilts	£300m
Cash	£100m
Interest rate swaps contract (market value)	£30m
Equity derivative contracts (market values)	£0m

The fund holds an unexpired put option that it bought on the UK FTSE 100 Index with a strike price of 3,800. The level of the UK FTSE 100 Index as at the latest audited scheme accounts date is 3,926. It also holds a long position in overseas developed equity futures.

The notional exposures of the equity derivative contracts as at the latest audited scheme accounts date are as follows:

UK (FTSE 100) equity put option (bought)	£100m
Overseas developed equity futures (long position)	£100m

The PV01 of the interest rate swaps contract is -£200,000 as at the latest audited scheme accounts date. The scheme is receiving the fixed leg of the swap and paying the floating leg.

Stage 1 – Calculate the initial stressed value of assets based on the refined asset stresses for non-derivative investments

Applying the refined asset stresses, the initial stressed value of assets (including the unstressed market value of the derivative investments, but before allowing for the stress impact of these derivatives) is £1,252m, calculated as follows:

<i>Asset</i>	<i>(A) Amount (£m)</i>	<i>(B) Refined asset stress</i>	<i>(A) × [1 + (B)] Stressed value (£m)</i>
UK equities	200	-22%	156
Emerging market equities	100	-21%	79
Overseas short- and medium-dated investment grade corporate bonds	100	+0%	100
Overseas long-dated investment grade corporate bonds	100	+2%	102
UK long-dated investment grade corporate bonds	100	+3%	103
Medium maturity index-linked gilts	200	+8%	216
Very long maturity index-linked gilts	300	+22%	366
Cash	100	0%	100
Market value of swaps	30	0% (stress analysis carried out in Stage 2)	30
Market value of equity derivatives	0	0% (stress analysis carried out in Stage 2)	0
Total	1,230	N/A	1,252

In the absence of a Bespoke Stress Calculation the stressed asset value would have been calculated by the PPF as £1,243m under the standard approach. This compares to the initial stressed value of assets, £1,252m, calculated above.

Stage 2 – Risk factor stress on derivative investments

Equity options

The stress in respect of the equity options is the difference between the stressed and unstressed intrinsic values:

The equity stress on the UK FTSE 100 Index put option is +£19m (see Example A in Part 6 for more details of this calculation). This acts to increase the overall stressed value of assets as the fund has bought the put option.

Equity futures

The stress of the equity futures is the notional exposure multiplied by the risk factor stress:

The equity stress on the overseas developed equities futures is -£16m, calculated as $£100m \times (-16\%)$.

Interest rate swap

Interest Rate Stress Value (IRSV)
= $PV01 \times \text{Interest Rate risk factor stress}$
= $-£200,000 \times -61$
= £12.2m

This overall stressed asset value is increased by the absolute value of IRSV because the scheme is receiving the fixed leg of the swap and paying the floating leg.

Stage 3 – Combine all the calculations

Overall stressed value of assets
= Initial stressed value + Equity options stress + Equity futures stress + absolute value of IRSV
= $£1,252m + £19m - £16m + £12.2m$
= £1,267,200,000

Illustration of how the asset stress will be used in the levy bill

The scheme's s179 valuation is rolled forward to the levy calculation date by the PPF, with the following results:

- smoothed and stressed liabilities of £1,500m
- smoothed assets of £1,200m

The stress factor (i.e. ratio of the stressed asset value divided by the unstressed asset value provided as part of the Bespoke Stress Calculation) is then applied to the smoothed assets. So:

$$\begin{aligned}\text{Smoothed and stressed assets} &= £1,200\text{m} \times (£1,267.2\text{m} \div £1,230\text{m}) \\ &= £1,236.3\text{m}\end{aligned}$$

$$\begin{aligned}\text{Underfunding} &= \text{Liabilities (on a smoothed and stressed basis)} \\ &\quad - \text{Assets (on a smoothed and stressed basis)} \\ &= £1,500\text{m} - £1,236.3\text{m} \\ &= £264\text{m}\end{aligned}$$

$$\text{Risk based levy} = \text{Underfunding} \times \text{insolvency rate} \times \text{scaling factor}$$

Appendix: Exchange Help File

Help for submitting asset breakdown on Exchange

Please note that the asset breakdown submitted here is used in the calculation of the Pension Protection Levy – it affects the roll-forward, smoothing and investment risk stressing of the s179 asset value, which feeds into the calculation of the risk-based levy.

This information should be taken from the scheme's most recently audited accounts.

If the breakdown of equities and bonds into their constituent components is not available, then there are two options available.

Firstly, you could obtain the split at the accounting date from the scheme's investment manager(s). Alternatively, where such a split would be disproportionately costly to obtain, you could obtain the split from the investment manager's report nearest to the accounting date. For example, if your accounting date is 5 April and you have the split as at 31 March from your regular monitoring of investments, you should enter the split as at 31 March as a proxy for the split at 5 April.

Some investments do not obviously fall into any of the categories available on Exchange. A general description of the key characteristics of each asset category has been provided so that, likely in conjunction with the investment advisor or asset manager, schemes can apply judgement as to which category best reflects that investment's characteristics.

For multi-asset funds, schemes are encouraged to obtain a detailed breakdown between asset classes and divide the investment amongst more than one category. For example, this could include:

- managed/balanced funds,
- insurance funds,
- diversified growth funds, or
- global aggregate bond portfolios.

Some funds with rapidly changing asset allocations may be classified as hedge funds, please also refer to the hedge fund description below.

For some investment classes, the most appropriate Exchange category may vary between schemes depending on the way that the pension scheme has invested. For example, investment in "infrastructure" is widely accessed via private equity-type vehicles and should in those circumstances be classified

as “private equity” investments. In some circumstances, however, the exposure to “infrastructure” can also be accessed through debt instruments, which means that the characteristics would be more like that of a corporate bond, so the investment should be classified accordingly.

Similar considerations apply to Special Purpose Vehicles and structured products. We expect that the advice of investment professionals be taken in deciding whether such investments can appropriately be allocated between the asset categories available on Exchange. If not, the value should be classified as “other”.

The classification of some investments may depend on financial market conditions, and in such cases schemes should consult their asset manager or investment advisor. For example, it may either be appropriate to classify a portfolio of convertible bonds along with equity investments or along with non-government bond investments. If the conversion option represents a high proportion of the overall asset value (generally when the underlying share price is high), then the convertibles are likely to be highly sensitive to the value of the underlying shares – so equity classification is likely to be most appropriate. On the other hand, if the conversion option represents a small proportion of the overall asset value (generally when the underlying share price is low), then the convertibles are likely to behave more like debt instruments – so classification along with non-government bonds is likely to be most appropriate.

The asset categories on Exchange are:

Fixed interest government bonds

This category covers investments issued by a sovereign body that provide a series of known income at pre-determined points in time. There is, however, a risk that some or all of these payments may not be made should the sovereign body default on its obligation. The values of such investments are sensitive to changes in interest rates and will typically have minimal or no sensitivity to credit spreads.

For most schemes, the majority of these will be UK government bonds (i.e. “gilts”). All overseas government bonds (e.g. US Treasury bonds, German bunds) and bonds issued by supranational organisations may also be included here.

Include relevant components of multi asset funds and insurance funds.

Fixed interest non-government bonds

This category covers investments issued by a corporate body that provide a series of known income at pre-determined points in time. There is however a risk that some or all of these payments may not be received due to the corporate body defaulting on its obligation. The values of such investments are sensitive to changes in interest rates and credit spreads.

Include UK and overseas corporate bonds, mortgage-backed securities, asset-backed securities. Investment managers may also refer to these as “credit” mandates. Include all levels of credit rating and debt-like investments i.e. investment grade corporate bonds, asset-backed securities (ABS) and mortgage-backed securities (MBS) and alternative credit, which includes:

- sub-investment grade (also known as high yield bonds),
- distressed debt,
- subordinated debt,
- senior debt,
- mezzanine debt,
- leveraged loans,
- asset-backed securities, and
- convertible bonds where they are classified as debt-like.

Include relevant components of multi asset funds and insurance funds.

Inflation-linked bonds

This category covers investments that provide a series of inflation-linked income at pre-determined points in time. There is a risk that some or all of these payments may not be received due to the issuer defaulting on its obligations. The values of such investments are sensitive to changes in interest rates and inflation and will typically have minimal or no sensitivity to credit spreads.

Include UK and overseas inflation/index linked government bonds and inflation/index linked corporate bonds. For most schemes, the majority of such bonds will be UK government bonds (i.e. “index-linked gilts”) but may also be issued by overseas governments and supranational organisations. Schemes should also reflect holdings in inflation-linked corporate bonds in this category.

Include relevant components of multi asset funds and insurance funds.

UK quoted equities

Include all shares listed/quoted on the London Stock Exchange or AIM. This category may also include convertible bonds where they are classified as equity-like.

Include relevant components of multi asset funds and insurance funds.

Overseas quoted equities

Include all shares listed/quoted on any overseas stock exchange. This category may also include convertible bonds where they are classified as equity-like.

Include relevant components of multi asset funds and insurance funds.

Unquoted equities / private equity

Represents investment in the equity capital of an unlisted company or investment structure whereby the investor is exposed to the first loss on that capital.

Include all UK and overseas unquoted shares, private equity, venture capital and leveraged buy-outs.

Include relevant components of multi asset funds and insurance funds.

Property

Include all UK and overseas land or property (commercial, residential and industrial). Include any land or property owned by the pension scheme that is occupied by a scheme sponsor.

Listed property funds (e.g. REITs) may be included here where the holding is explicitly intended to provide exposure to the property sector. However, small concentrations of these held as part of a larger equity portfolio need not be separately identified and can be included along with the rest of the portfolio as quoted equities.

Include relevant components of multi asset funds and insurance funds.

Insurance funds

Insurance fund investments may include pooled funds, deposit administration contracts, with-profits contracts and similar. For such investments, schemes are encouraged to obtain a detailed breakdown between asset categories as at (or near to) the relevant scheme accounts date. Each component should be included within the relevant other categories. In the few instances where this breakdown is not available, the amount should be included in this category.

Deferred or immediate fully insured annuities

Insured annuities are contracts through which payments in respect of a portion of the scheme's liabilities are met by a third party insurance company. Typically such contracts will be written in the name of the pension scheme trustees.

Include the proportion of total assets invested in annuities where the audited accounts reflect a value for these assets. These annuities generally relate to a particular group of named members and/or dependants of the scheme.

Hedge funds

A hedge fund may invest in a diverse range of assets and may employ a variety of investment strategies to maintain a hedged portfolio intended to protect investors from downturns in the market while maximizing returns on market upswings. Generally hedge fund strategies would aim to limit volatility relative to equities and tend to have a cash based performance benchmark, e.g. LIBOR+x per cent. A typical feature of hedge funds will be their ability to use derivatives, long/short positions and leverage to gain significant long/short exposure to certain markets or opportunities.

This is a particularly difficult area of investment to define, given the variety of asset classes and strategies that are used in practice. General descriptions of the types of strategies that might be considered include:

- "global macro",
- "event-driven",
- "relative value",
- "real return",
- "multi strategy",
- "absolute-return funds", and
- "global tactical asset allocation" (GTAA) strategies.

Where currency explicitly forms part of a pension scheme's investment strategy, this is typically done through a leveraged vehicle, so such funds should be included with hedge funds. Examples of fund types to include here are: FX carry and emerging market currency funds.

Commodities

Commodities are goods that are generally used as primary goods in the manufacturing of other products. Examples include oil, metals and agricultural goods.

Pension schemes will typically not have direct exposure to commodities but will access the returns on them via commodity indices. Timber and forestry products can be considered as commodities. Funds that are designed to provide long-only exposure to commodity markets should be classified as commodities.

Cash and net current assets

Include cash in any currency or denomination, cash held in money market funds, savings accounts, bank accounts etc. Note that active currency strategies should be included with hedge funds. Include net current assets.

Other

Some assets do not obviously fall into any of the above categories. A general description of the key characteristics of each asset category has been provided so that in such circumstances, the pension scheme, likely in conjunction with their investment advisor or asset manager, can apply judgement as to which category best reflects that assets characteristics – this may involve dividing the asset amongst more than one category.

If assets cannot be assigned in this way, they should be recorded in this category.

The market value of any derivative exposures (e.g. repo portfolios, LDI arrangements, equity futures) should be included in this category.