Risks and Financial Stability Department

EIOPA-BoS-19/135
29/03/2019

Annex to IORP Stress Test 2019 Specifications

Technical Specifications Common Balance Sheet

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1. Introduction

1.1.1. These technical specifications provide guidance and prescription in valuing the common balance sheet for the DB/hybrid part of the 2019 IORP stress test. The common balance sheet is valued on a market-consistent basis and includes all security and benefit adjustment mechanisms. The valuation methodology for the common balance sheet as described here is the same for all IORPs participating in the stress test. These technical specifications contain only minor changes compared to the technical specifications used in the EIOPA IORP stress test 2017.

1.1.2. The valuation of the common balance sheet in the stress test is based on the market-consistent balance sheet as included in EIOPA's opinion on a common framework for risk assessment and transparency for IORPs[1].

1.1.3. Technical provisions as reported in the common balance sheet should be calculated using a risk free discount rate[2] and include a risk margin for liabilities that cannot be replicated on financial markets.

1.1.4. Among the security and benefit adjustment mechanisms to be included on the common balance sheet are:

- Legally enforceable and non-legally enforceable sponsor support;
- Pension protection schemes;
- Conditional benefits;
- Discretionary benefits;
- Ex ante benefit reductions;
- Ex post benefit reductions;
- Benefit reductions in case of sponsor default.

1.1.5. Very often the use and value of security and benefit adjustment mechanisms will depend on the IORP's financial situation. For example:

- The IORP is expected to pay more benefits when it has more assets at its disposal, if these benefits are conditional on the IORP's financial position.
- The sponsor is expected to pay more contributions in the future when the IORP has fewer assets to cover liabilities, if it is required to supplement shortfalls.
- A pension protection scheme is expected to contribute less to secure benefits when the IORP's financial situation is more favourable.

1.1.6. The stress test does not include the calculation of a solvency capital requirement (SCR) or of a standardised risk assessment as described in EIOPA's opinion.

1.1.7. As in the 2017 IORP stress test, EIOPA expects that in this stress test, IORPs will report stressed and unstressed common balance sheets which are either balanced or show an excess of assets over liabilities. To achieve this, if otherwise an excess of liabilities over assets would be reported and no other balancing items are available, IORPs should assume in this stress test that

[1] https://eiopa.europa.eu/Publications/Opinions/EIOPA-BoS-16-075-Opinion_to_EU_Institutions_Common_Framework_IORPs.pdf

[2] In line with EIOPA's Opinion and the approach taken in previous IORP stress tests, there are no adjustments to the risk free interest rate curve, like matching adjustment or volatility adjustment. See section 10 of annex 1 of EIOPA's opinion, https://eiopa.europa.eu/Publications/Opinions/EIOPA-BoS-16-075-Annex_1_Technical_part.pdf

there are ex post benefit reduction mechanisms which would always balance the common balance sheet. IORPs should also apply this assumption when, according to national law, benefits are reduced when an IORP is wound up due to liabilities exceeding assets.

1.1.8. An IORP does not have to calculate the values of security and benefit adjustment mechanisms if it has sufficient financial assets to cover liabilities on the common balance sheet.

Balancing item approach

1.1.9. The common balance sheet may, dependent on the characteristics of a pension scheme, include an element that will always ensure that liabilities do not exceed assets, i.e. will always 'balance the common balance sheet'. This could be the case because this element can in all cases provide additional assets to cover technical provisions, or because this element can in all cases decrease the technical provisions to such a level that the available assets can cover or equate the (amended) technical provisions. In these cases, EIOPA considers that applying a balancing item approach is appropriate.

1.1.10. Under the balancing item approach, the value of the element at hand is simply the value necessary to equal the assets to technical provisions on the common balance sheet.

1.1.11. There are several elements that could, under specific circumstances, serve as a balancing item:

- Unlimited, legally enforceable sponsor support provided by a strong sponsor;
- A pension protection scheme that covers 100% of benefits and is valued separately (from sponsor support) on the common balance sheet;
- Unlimited benefit reductions. This could be ex ante benefit reductions, ex post benefit reductions, or benefit reductions in case of sponsor default[3].

1.1.12. Whether or not an element can in a specific case be valued using the balancing item approach depends on the characteristics of the element. The conditions which must be met for an element to qualify as a balancing item are specified in paragraphs 2.5.45-46 for benefit reductions, 2.7.41-46 for unlimited, legally enforceable sponsor support and 2.8.7-8 for pension protection schemes below.

1.1.13. Since the values of security and benefit reduction mechanisms do not have to be calculated if IORPs have sufficient financial assets to cover liabilities on the common balance sheet, the balancing item approach is only relevant in case financial assets are smaller than liabilities on the common balance sheet.

1.1.14. In case there are different elements available for an IORP which may in principle act as a balancing item, only one item can be valued using the balancing item approach in this stress test. To determine which element should be the balancing item in this case, IORPs should check in the following order whether an element meets the conditions to qualify as a balancing item[4]:

[3] See paragraph 2.5.43.

[4] An IORP may have valued an element which could in principle be valued as a balancing item using another valuation methodology. In this case, the check which element should be the balancing item only has to be performed on the remaining elements which could in principle act as a balancing item.

- Sponsor support: If sponsor support qualifies as a balancing item, according to the conditions, it will be included in the common balance sheet as a balancing item. This also means that neither benefit reductions nor the pension protection scheme will have to be valued on the common balance sheet.
- Pension protection scheme: If sponsor support does not qualify as a balancing item, it should be checked whether a pension protection scheme qualifies as a balancing item, according to the conditions. If this is the case, sponsor support will have to be valued in accordance with regular valuation methods, the pension protection scheme will be the balancing item, and benefit reductions will not have to be valued on the common balance sheet.
- Benefit reduction mechanisms: If neither sponsor support nor a pension protection scheme qualify as a balancing item, according to the conditions, benefit reductions will be the balancing item. Sponsor support and a pension protection scheme (where applicable) will have to be valued in accordance with regular valuation methods.

Valuation common balance sheet

1.1.15. IORPs are asked to perform the valuation of the various components of the common balance sheet separately: technical provisions, sponsor support, pension protection schemes, recoverables from (re)insurance and other assets and liabilities.

1.1.16. These technical specifications put forward the general method to value the best estimate of technical provisions by calculating the probability weighted average of the discounted value of future cash flows. They contain general guidance with respect to the principles and the assumptions used in such stochastic valuation, such as with regard to behaviour of boards of IORPs, members and sponsors.

1.1.17. The technical specifications discuss the way future cash flows should be determined for the calculation of the best estimate of technical provisions. They include rules on the benefits and contributions to be included in cash flows.

1.1.18. The specifications for the valuation of the best estimate of technical provisions also contain definitions of conditional and discretionary benefits as well as benefit reduction mechanisms.

1.1.19. The risk margin to be included in technical provisions should either be set to zero (if liabilities excluding benefit reductions exceed financial assets) or be determined using a simplification (if financial assets exceed liabilities excluding benefit reductions).

1.1.20. The valuation of sponsor support follows a principle based approach. IORPs which do not satisfy the conditions to use the balancing item approach for (unlimited) sponsor support will have to value it explicitly.

1.1.21. The principles for the valuation of sponsor support specify that IORPs should take into account the default probability of the sponsor and the maximum amount of support that the sponsor is able to afford. IORPs are provided with an elaborate set of possibilities to establish the default probability of the sponsor. Moreover, only broad principles for the calculation of the maximum amount of sponsor support are specified, supporting an IORP- and member states specific assessment.

1.1.22. The technical specifications put forward three simplifications for the valuation of unlimited sponsor support. The simplifications may be used by IORPs

which do not wish or are not able to perform their own principle-based valuation.

Current IORP systems and supervisory frameworks

1.1.23. The valuation of the common balance sheet should be consistent with existing national IORP systems and national prudential regulation.

1.1.24. This does not imply that the values of items on the common balance sheet will be the same as similar items on national prudential balance sheets. It does imply, though, that the cash flows relating to security and benefit adjustments should be consistent with existing pension arrangements and supervisory regimes.

1.1.25. The timing of sponsor payments is often determined by national funding targets – i.e. the level of technical provisions that has to be covered with financial assets – and recovery periods.

1.1.26. The first two (of three) simplifications[5] provided for the valuation of unlimited sponsor support all assume that sponsors restore any shortfall with respect to the value of technical provisions included in the common balance sheet - hence not the national value of technical provisions – within the average duration of the liabilities. The third simplification links the period for contributions to an approximate assessment of what the sponsor can afford, but still targets the value of technical provisions on the common instead of the national balance sheet. As such, these three methods should be considered simplifications of national recovery mechanisms.

Proportionality and simplifications

1.1.27. IORPs may adopt simplifications for the valuation of the common balance sheet when these simplifications are proportionate to the nature, scale and complexity of the underlying risk.

1.1.28. Simplifications are provided in these technical specifications and further simplifications can be adopted by IORPs as long as it is appropriate to do so and a description of the simplifications used can be provided by the IORPs (see Annex 2 for an overview of possible simplifications). Some elements of the technical specifications will not be relevant for IORPs in some member states, but have been included because they are relevant in other member states. In addition, the degree of materiality of many of the issues included within the specifications will vary depending on the nature of IORPs in member states.

1.1.29. IORPs should perform two steps to determine the proportionality of a simplification.

<u>Step 1: Nature, scale and complexity of underlying risks</u>

1.1.30. The assessment of nature, scale and complexity of underlying risks serves as a guide to identify where simplified methods are likely to be appropriate. The assessment should include all risks which materially affect the amount or timing of cash flows.

1.1.31. The nature and complexity of risks – including the impact of future management actions and behaviour of members/beneficiaries and sponsors – determines the level of sophistication and expertise needed to value the items on the common balance sheet. In this respect, it is important to

[5] See paragraph 2.7.51-2.7.70.

establish whether risks have a significant asymmetric impact on cash flows of pension obligations and sponsor support, in particular if pension schemes contain embedded options like caps and floors. If this is the case, a stochastic valuation may be more suitable than a deterministic valuation.

1.1.32. The measurement of scale allows IORPs to distinguish between 'small' and 'large' or material and non-material risks. It provides a threshold below which it would be justifiable not to take into account certain risks. IORPs need to compare the size of risks against a benchmark – such as contributions or technical provisions – to assess the scale of risks in relative terms.

Step 2: Establish that model-error is not material

1.1.33. IORPs are not required to quantify the degree of model-error, or to re-calculate the value of the components of the common balance sheet using a more accurate method in order to demonstrate that the difference between the result of the chosen method and the result of a more accurate method is immaterial. Instead, it is sufficient if there is reasonable assurance that the model error implied by the application of the chosen method (and hence the difference between those two amounts) is immaterial. The particular situation of an exercise like this, which usually requires a lower degree of accuracy than financial and supervisory reporting, may be taken into account in the assessment of the model-error.

1.1.34. Time, costs and unavoidable model-error: It should be recognised that time available to complete the stress test is limited. IORPs are requested to perform the calculations on a best effort basis and may have to apply simplifications that result in material model error due to time constraints.

1.1.35. IORPs may have to choose methods and simplifications that lead to material model-errors due to a lack of resources. For example, IORPs may apply a deterministic valuation method where a stochastic method seems more suitable. The latter is very time consuming and potentially costly, especially when the IORP does not already have the necessary data and modelling infrastructure in place.

1.1.36. IORPs may have to make assumptions which are uncertain or conjectural and cannot be validated due to data deficiencies.

2. Valuation common balance sheet

2.1. Valuation date

2.1.1. The reporting date to be used by all participants is end December 2018. If data is not available at this date, then a suitable roll forward method should be used from the date of the most recent available data. If IORPs are unsure as to how to do this, they should contact their national supervisory authority (NSA).

2.2. General principles for valuations

2.2.1. The value of technical provisions shall be equal to the sum of a best estimate and a risk margin. However, where future cash flows associated with pension obligations can be replicated reliably using financial instruments for which a reliable market value is observable, the value of technical provisions associated with those future cash flows should be determined on the basis of the market value of those financial instruments ("calculation of technical provisions as a whole"). In this case, separate calculations of the best estimate and the risk margin are not required.

2.2.2. As a general principle, the best estimate of technical provisions as well as the value of sponsor support should correspond to the probability weighted average of discounted future cash flows in possible future scenarios.

2.3. Presentation

2.3.1. Pure defined contribution obligations should be reported separately from all other obligations in the common balance sheet.

2.3.2. "All other obligations" should include all obligations arising out of schemes/contracts which provide any guarantees to members and beneficiaries.

2.4. Best estimate of technical provisions: principles and assumptions

Principles

2.4.1. The best estimate of technical provisions should be valued on a market consistent basis. IORPs are asked to carry out the calculation of the best estimate of technical provisions discounting future cash flows using the risk free interest rate curve.

2.4.2. No adjustment to take account of the own credit standing of the IORP should be made.

2.4.3. The best estimate should correspond to the probability weighted average of future cash in- and outflows taking account of the time value of money.

2.4.4. Therefore, the best estimate calculation should allow for the uncertainty in the future cash flows. The calculation should consider the variability of the cash flows in order to ensure that the best estimate represents the mean of the distribution of cash flow values. Allowance for uncertainty does not suggest that additional margins should be included within the best estimate.

2.4.5. The best estimate is the average of the outcomes of all possible scenarios, weighted according to their respective probabilities. Although, in principle, all possible scenarios should be considered, it may not be necessary, or even possible, to explicitly incorporate all possible scenarios in the valuation of the liability, nor to develop explicit probability distributions in all cases,

depending on the type of risks involved and the materiality of the expected financial effect of the scenarios under consideration. Moreover, it is sometimes possible to implicitly allow for all possible scenarios, for example using explicit formulae.

2.4.6. Cash flow characteristics that should, in principle and where relevant, be taken into consideration in the application of the valuation technique include the following (non-exhaustive list):

(a) Uncertainty in the timing, frequency and magnitude of benefit payments;

(b) Uncertainty in member and sponsor behaviour;

(c) Uncertainty in contributions.

2.4.7. The calculation of the best estimate should be based on actuarial and statistical techniques which appropriately reflect the risks that affect the cash flows. This may include simulation methods, deterministic techniques and analytical techniques.

2.4.8. The best estimate should be calculated gross, without deduction of the amounts recoverable from (re)insurance contracts and special purpose vehicles, which should be calculated separately.

Simplification

2.4.9. In cases where cash flows are not available or a calculation based on available cash flows is considered to be too burdensome a simplification can be used to determine the best estimate of technical provisions. For example the best estimate of technical provisions can be determined based on the duration of the corresponding obligations.

Assumptions consistent with information provided by financial markets

2.4.10. In order to calculate the best estimate of technical provisions of the IORP in line with the general principle for valuation, assumptions consistent with information about or provided by financial markets shall be made.

2.4.11. When IORPs derive assumptions on future financial market parameters or scenarios, they should be able to demonstrate that the choice of the assumptions is appropriate and consistent with the valuation principles set out in section 2.12.

2.4.12. Where the IORP uses a model to produce future projections of market parameters (market consistent asset model, e.g. an economic scenario file), such model should comply with the following requirements:

(i) it generates asset prices that are consistent with deep, liquid and transparent financial markets;

(ii) it assumes no arbitrage opportunity;

(iii) the calibration of the parameters and scenarios is consistent with the risk-free term structure used to calculate the best estimate.

2.4.13. The following principles should be taken into account in determining the appropriate calibration of a market consistent asset model:

(i) the asset model should be calibrated to reflect the nature and term of the liabilities, in particular of those liabilities giving rise to significant guarantee and option costs;

(ii) the asset model should be calibrated to the risk-free term structure used to discount the cash flows;

(iii) the asset model should be calibrated to a properly calibrated volatility measure.

2.4.14. In principle, the calibration process should use market prices only from financial markets that are deep, liquid and transparent. If the derivation of a parameter is not possible by means of prices from deep, liquid and transparent markets, other market prices may be used. In this case, particular attention should be paid to any distortions of the market prices. Corrections for the distortions should be made in a deliberate, objective and reliable manner.

2.4.15. A financial market is deep, liquid and transparent, if it meets the following requirements:

(i) transactions involving a large quantity of financial instruments can take place without significantly affecting the price of the instruments (deep);

(ii) financial instruments can readily be converted through an act of buying or selling without causing a significant movement in the price (liquid);

(iii) current trade and price information is readily available to the public, in particular to the IORPs (transparent).

2.4.16. The calibration of the above mentioned asset models may also be based on adequate actuarial and statistical analysis of economic variables provided they produce market consistent results. For example:

(i) to establish the appropriate correlations between different asset returns;

(ii) to determine probabilities of transitions between credit quality steps and default of corporate bonds;

(iii) to determine property volatilities. As there is virtually no market in property derivatives, it is difficult to derive property implied volatility. Thus the volatility of a property index may often be used instead of property implied volatility.

Assumptions consistent with generally available data on pension technical risks

2.4.17. Generally available data refers to a combination of:

- Internal data;
- External data sources such as industry or market data.

2.4.18. Internal data refers to all data which is available from internal sources. Internal data may be either:

- IORP-specific data;
- Pension scheme/contract-specific data.

2.4.19. All relevant available data whether external or internal, should be taken into account in order to arrive at the assumption which best reflects the characteristics of the underlying portfolio of pension obligations. In the case of using external data, only the data to which the IORP can reasonably be expected to have access to should be considered.

2.4.20. The extent to which internal data is taken into account should be based on:

- The availability, quality and relevance of external data;
- The amount and quality of internal data.

2.4.21. Where IORPs use data from an external source, they should derive assumptions on risks that are based on that data according to the following requirements:

(a) IORPs are able to demonstrate that the use of data from an external source is more suitable than the use of data which are exclusively available from an internal source;

(b) IORPs know the origin of the data and the assumptions or methodologies used to process that data;

(c) IORPs identify any trends in the data from an external source and the variation, over time or across data, of the assumptions or methodologies in the use of the data;

(d) IORPs are able to demonstrate that the assumptions and methodologies referred to in points (b) and (c) appropriately reflect the characteristics of the portfolio of pension obligations.

Members/beneficiaries or sponsor behaviour

2.4.22. IORPs are required to identify members/beneficiaries or sponsor behaviour where it impacts on the calculation of the best estimate of technical provisions.

2.4.23. IORPs may exclude any allowance for members/beneficiaries or sponsor behaviour if they consider it would be immaterial.

2.4.24. Any assumptions made by IORPs with respect to the likelihood that members/beneficiaries or sponsors will exercise contractual options, should be realistic and based on current and credible information. The assumptions should take account, either explicitly or implicitly, of the impact that future changes in financial and non-financial conditions may have on the exercise of those options.

2.4.25. Assumptions about the likelihood that members/beneficiaries or sponsors will exercise contractual options should be based on analysis of past members/beneficiaries or sponsors' behaviour and a prospective assessment of expected members/beneficiaries or sponsors' behaviour.

IORP management actions

2.4.26. The methods and techniques for the estimation of future cash flows, and hence the assessment of the provisions for pension liabilities, should take account of potential future management actions by the IORP.

2.4.27. IORPs may exclude any allowance for management actions if they consider they would be immaterial.

2.4.28. Assumed future management actions should be realistic and consistent with the IORPs current business practice and business strategy and take due account of possible correlations with the financial position of the IORP. If there is sufficient evidence that the IORP will change its practices or strategy, the assumed future management actions should be consistent with the changed practices or strategy.

2.4.29. Assumed future management actions should be consistent with each other.

2.4.30. IORPs should not assume that future management actions would be taken that would be contrary to their obligations towards members/beneficiaries or sponsors or to legal provisions applicable to the IORPs. The assumed future actions should take account of any public indications by the IORP as to the actions that it would expect to take, or not take in the circumstances being considered.

2.4.31. Assumptions about future management actions should take account of the time needed to implement the actions and any expenses caused by them. IORPs should be able to verify that assumptions about future management actions are realistic through:

1. a comparison of assumed future management actions with actions actually taken previously by the IORP;

2. a comparison of future management actions taken into account in the current and past calculations of the best estimate;

3. an assessment of the impact of changes in the assumptions of future management actions on the value of the technical provisions.

Expert judgement

2.4.32. IORPs should choose assumptions based on the expertise of persons with relevant knowledge, experience and understanding of the risks inherent in occupational pension provision (expert judgement). In certain circumstances expert judgement may be necessary when calculating the best estimate, among other:

- in selecting the data to use, correcting its errors and deciding the treatment of outliers or extreme events;
- in adjusting the data to reflect current or future conditions, and adjusting external data to reflect the IORPs features or the characteristics of the relevant portfolio of pension obligations;
- in selecting the time period of the data;
- in selecting realistic assumptions;
- in selecting the valuation technique or choosing the most appropriate alternatives existing in each methodology;
- in incorporating appropriately into the calculations the environment under which the IORPs have to provide occupational pensions.

2.5. Best estimate of technical provisions: methodology for calculation

Cash flow projections

2.5.1. Cash flow projections should reflect expected realistic future demographic, legal, medical, technological, social or economic developments over the lifetime of the pension obligations (see section 2.11 for the inclusion of inflation and salary increases).

2.5.2. Mortality tables may differ between IORPs as mortality rates are different between member states as well as between different IORPs within one Member State, given the individual structure of the population of members and beneficiaries. However, the cash flow projections should be based on appropriate and recent mortality tables and include a future trend in mortality rates.

2.5.3. The cash flow projections used in the calculation of the best estimate should be made separately for each contract or pension obligation. Where the separate calculation for each obligation would be an undue burden on the IORP, it may carry out the projection by grouping obligations, provided that the grouping complies with the following requirements:

(a) There are no significant differences in the nature and complexity of the risks underlying the obligations that belong to the same group;

(b) The grouping of obligations does not misrepresent the risk underlying the contracts and does not misstate their expenses;

(c) The grouping of obligations is likely to give approximately the same results for the best estimate calculation as a calculation on a per contract basis, in particular in relation to financial guarantees and contractual options included in the obligations.

2.5.4. In certain specific circumstances, the best estimate of technical provisions may be negative (e.g. for some individual obligations under some types of IORP). This is acceptable and IORPs should not set to zero the value of the best estimate in those circumstances.

Time horizon

2.5.5. The projection horizon used in the calculation of the best estimate should cover the full lifetime of all the cash in- and out-flows[6] required to settle the obligations related to existing pension schemes / contracts on the date of the valuation, unless an accurate valuation can be achieved otherwise.

2.5.6. The determination of the lifetime of pension obligations should be based on up-to-date and credible information and realistic assumptions about when the existing pension obligations will be discharged or cancelled or expired.

2.5.7. IORPs may not be able to perform stochastic valuations of non-unconditional benefits over the full lifetime of the pension obligations due to model restrictions. In that case IORPs may apply simplifications with regard to the projection horizon, and are requested to provide an explanation (and quantification of the impact, where possible) of the simplification in the qualitative questionnaire.

Benefits and contributions to be included in cash flows

2.5.8. For IORPs/schemes where obligations of the IORP to pay benefits are only established following payments of contributions to the IORP/scheme, cash flows to be included in the calculation of technical provisions should be determined as follows:

1. All cash flows relating to obligations of the IORP relating to current members and beneficiaries shall be recognised in the calculation of technical provisions, unless otherwise stated below. Apart from the cases described below, obligations shall include those obligations relating to current members and beneficiaries which result from contributions received by the IORP after the valuation date.

[6] The extent to which future contributions and benefits should be included in cash in- and out-flows is determined by the rules provided in paragraphs 2.5.8-2.5.9.

2. Any cash flows relating to obligations of the IORP relating to contributions received by the IORP after any of the following dates shall not be recognised in technical provisions:

a. The future date where the IORP has a unilateral right or obligation to terminate the agreement with the plan sponsor and/or the plan members to provide the pension benefits as agreed between plan sponsor and plan members;

b. The future date where the IORP has a unilateral right or obligation to reject additional contributions;

c. The future date where the IORP has a unilateral right or obligation to amend the contributions payable after this date or the benefits related to those contributions in such a way that the contributions fully reflect the risks related to them and the related benefits; or

d. The future date where the sponsor or sponsors have a unilateral right to terminate future accrual of benefits.

2.5.9. For IORPs/schemes where obligations of the IORP to pay benefits are established independently from payments of contributions to the IORP, cash flows to be included in the calculation of technical provisions should be determined as follows:

1. All cash flows relating to obligations of the IORP relating to current members and beneficiaries shall be recognised in the calculation of technical provisions unless otherwise stated below. Apart from the cases described below, obligations shall include those obligations relating to current members and beneficiaries which are established after the valuation date. Any contributions which are directly linked to the financing of certain obligations established after the valuation date shall also be recognised in technical provisions, unless otherwise stated below.

2. Any cash flows relating to obligations established after any of the following dates shall not be recognised in technical provisions:

a. The future date where the IORP has a unilateral right or obligation to terminate the agreement with the plan sponsor and/or the plan members to provide the pension benefits as agreed between plan sponsor and plan members;

b. The future date where the IORP has a unilateral right or obligation to reject the establishment of additional obligations;

c. In cases where contributions are directly linked to the financing of certain obligations established after the valuation date, the future date where the IORP has a unilateral right or obligation to amend those contributions or those obligations to fully reflect the risk; or

d. The future date where the sponsor or sponsors have a unilateral right to terminate future accrual of benefits.

2.5.10. Depending on the specifications in 2.5.8 and 2.5.9 above, cash flows to be included in the calculation of technical provisions on the common balance sheet may only include accrued benefits the IORP is obliged to pay, whereas the IORP conducts a valuation based on an 'open modelling' assumption. In that case IORPs may apply simplifications to determine the proportion of

adjustment and security mechanisms that are attributable to accrued benefits and are requested to provide an explanation of any material simplifications in the qualitative questionnaire.

Expenses

2.5.11. In determining the best estimate, the IORP should take into account all cash flows arising from expenses that it will incur in servicing all future obligations related to existing pension schemes/contracts.

2.5.12. The IORP should disregard expenses borne by the employer.

2.5.13. Expenses in respect of (re)insurance contracts and special purpose vehicles should be taken into account in the gross calculation of the best estimate. IORPs should split expenses between existing pension schemes/contracts and possible future schemes/contracts, while only the former should be included in the best estimate of technical provisions.

2.5.14. Expenses should include both allocated and overhead expenses. Allocated expenses are those expenses which the IORP incurs in servicing pension obligations and which are directly assignable to the source of expense. Overhead expenses comprise all other expenses which the IORP incurs in servicing pension obligations.

2.5.15. Overhead expenses should be allocated in a realistic and objective manner and on a consistent basis over time to the parts of the best estimate to which they relate.

2.5.16. IORPs should consider their own analysis of expenses and any relevant data from external sources such as average industry or market data.

2.5.17. Assumptions with respect to future expenses arising from commitments made on or prior to the date of valuation have to be appropriate and take into account the type of expenses involved. IORPs should ensure that expense assumptions allow for future changes in expenses and such an allowance for inflation is consistent with the economic assumptions made. Future expense cash flows are usually assumed to vary with assumed rates of general level of expense inflation in a reasonable manner.

2.5.18. Relevant market data needs to be used to determine expense assumptions which include an allowance for future cost increase. Furthermore, expense inflation must be consistent with the types of expenses being considered.

2.5.19. Any assumptions about expected cost reductions should be realistic, objective and based on verifiable data and information.

2.5.20. For the assessment of future expenses, IORPs should take into account all expenses that are directly related to the on-going administration of obligations related to existing pension schemes/contracts, together with a share of the relevant overhead expenses. Overhead expenses should be split between existing and future schemes/contracts based on recent analyses of the operations of the business and the identification of appropriate expense drivers and relevant expense apportionment ratios. Cash flow projections should include, as cash out-flows, the recurrent overhead expenses attributable to the existing business at the calculation date of the best estimate.

2.5.21. In order to determine which expenses best reflect the characteristics of the underlying pension obligations and to ensure that the technical provisions are calculated in a reliable and objective manner, IORPs should consider the

appropriateness of both market consistent expenses and IORP specific expenses. If sufficiently reliable market consistent expenses are not available, participants should use IORP-specific information to determine expenses that will be incurred in servicing pension obligations provided that the IORP-specific information is assessed to be appropriate.

2.5.22. Expenses that are determined by contracts between the IORP and third parties have to be taken into account based on the terms of the contract.

Conditional and discretionary benefits

2.5.23. All unconditional as well as non-unconditional benefits should be included in the common balance sheet. Two types of non-unconditional benefits are distinguished:

1. conditional benefits;
2. discretionary benefits.

2.5.24. The value of both types of non-unconditional benefits should be determined and reported separately on the common balance sheet. The distinction between discretionary benefits and conditional benefits is determined by the existence of a realistic discretionary power to grant certain benefits or to deviate from an existing policy to grant benefits.

2.5.25. 'Conditional benefits' are benefits which are granted based on certain "objective" conditions without a realistic discretionary power of the IORP to deviate from that policy. This means that conditional benefits have a payoff that can be objectively linked to some observable realisation. The following examples of conditional benefits may illustrate the concept:

(a) Benefits that are granted on the basis of legally or contractually established policies which only contain certain "objective" conditions;

(b) Benefits that are legally or contractually based on the performance of the contract, the IORP or a defined set of assets;

(c) Benefits that are subject to an ex-ante benefit adjustment mechanism, i.e. a mechanism based on a contract concluded beforehand and which describes precisely under which conditions and to which extent adjustments will take place; and

(d) Benefits that are granted on the basis of a specified policy of adjusting the accrued benefits without a realistic discretionary power of the IORP to deviate from that policy.

2.5.26. 'Discretionary benefits' are benefits which are either granted based only on a "subjective" decision making process or based on "objective" conditions as part of a "subjective" decision making process in which the IORP has a realistic discretionary power to deviate from the conditions. The results of this process are not concluded beforehand, but the fact that there is such a process may be. The granting of those benefits can be based upon financial or demographic developments, but does not have any a-priori link to these developments. Discretionary benefits are typically granted by means of a periodical decision of the IORP based on non-formalised criteria.

2.5.27. There may be no recurrent practice or expectation of granting those benefits. In other cases, discretionary benefits may have a specified or perceived policy of adjusting benefits, but also a realistic discretionary power to deviate from that policy. The realistic discretionary power is closely linked to the communication to members and beneficiaries, as it must be clear for them

that no legal rights can be derived from possible "objective" conditions (for example a specified or perceived policy of adjusting benefits) to obtain these benefits.

2.5.28. In cases where an objective measure (explicit policy), or a series of historical decisions and/or communications from which a pattern can be derived (implicit policy), is available to assist in a discretionary decision-making process, it may not always be completely clear whether the IORP has a realistic discretionary power to deviate from the policy. In such cases, NSAs may provide guidance to IORPs on the distinction between discretionary and conditional benefits.

2.5.29. The granting of discretionary benefits is a management/trustee action and assumptions about it should be realistic and verifiable. Assumptions about the granting of discretionary benefits should take the relevant and material characteristics of the mechanism for their distribution into account.

Valuation requirements for non-unconditional benefits

2.5.30. The value of non-unconditional benefits depends on a wide range of factors, which includes future IORP management actions and sponsor behaviour. Valuing these benefits incorporates some degree of estimation, even when the benefits are not only subject to a discretionary decision-making process, but also to a conditionality which would in itself be capable of being objectively modelled. Obtaining a best estimate value includes a level of complexity in the necessary modelling. Furthermore, it may be difficult to model how the discretionary powers of the IORP management / sponsor will be exercised under different future scenarios. For example, past experience may not be a reliable guide for future behaviour.

2.5.31. For every non-unconditional benefit, IORPs are required to identify the risk drivers which have the potential to materially affect (directly or indirectly) the value of the benefit.

2.5.32. As a first step, the non-unconditional benefits could be valued separately as if unconditional, in order to provide an upper limit.

2.5.33. The best estimate of non-unconditional benefits may be valued by using one or more of the following methodologies:

(a) a stochastic approach using for instance a market-consistent asset model (includes both closed form and stochastic simulation approaches);

(b) a deterministic valuation based on expected cash flows in cases where this delivers a market-consistent valuation of the technical provision, including the cost of options and guarantees.

2.5.34. For the purposes of valuing the best estimate of non-unconditional benefits, a stochastic simulation approach would consist of an appropriate market consistent asset model for projections of risk-neutral returns (such as equity, fixed income and property returns), together with a dynamic model incorporating the corresponding value of liabilities (incorporating the stochastic nature of any relevant non-financial risk drivers).

2.5.35. For the purposes of the stochastic approach, a range of scenarios or outcomes appropriate to both valuing the benefits and the underlying asset mix, together with the associated probability of occurrence should be set. A stochastic approach typically uses a large number of projections (scenarios) with attributed probabilities. The number and type of scenarios are not prescribed but should be set so that a market consistent valuation is

determined. The range of scenarios should be sufficiently wide, reflecting the range of possible outcomes.

2.5.36. If appropriate, simplifications regarding the projection horizon may be applied because of model restrictions that prohibit stochastic valuations of non-unconditional benefits over the full lifetime of the pension obligations. Simplifications may also be applied to determine the proportion of adjustment and security mechanisms that are attributable to accrued benefits as valuations are conducted based on an 'open modelling' assumption, whereas the best estimate on the common balance sheet may only include accrued benefits (depending on the rules on benefits and contributions to be included in cash flows).

2.5.37. If no marked-to-market model can be defined, the benefit should be marked-to-model. Assumptions, variables and parameters used in the model should be market consistent and IORPs should be able to explain them.

2.5.38. IORPs should take into account the discretionary element of discretionary benefits in their valuation. IORPs are expected to be able to clarify their assumptions regarding discretionary elements and to be able to explain the way that these elements are incorporated in the valuation. Given their discretionary nature, no methodology for the inclusion of discretionary elements is prescribed. IORPs are allowed to use simplifications in the valuation where appropriate.

2.5.39. Where relevant, the assumptions on members' behaviour should be appropriately founded in statistical and empirical evidence, to the extent that it is deemed representative of the future expected behaviour.

2.5.40. Appropriate consideration should also be given to an increasing future awareness of policy options as well as members' and beneficiaries' possible reactions to a changed financial position of an IORP. In general, members' and beneficiaries' behaviour should not be assumed to be independent of financial markets, an IORP's treatment of its members and beneficiaries or publicly available information unless proper evidence to support the assumption can be observed

2.5.41. Given a pattern which may be visible in the use of discretionary decision-making processes, IORPs may or may not find a correlation between their funding position and the granting of discretionary benefits.

2.5.42. When valuing non-unconditional benefits, IORPs should consider whether the following factors are relevant and material for the valuation of the benefits and take them into account accordingly, applying the principle of proportionality.

- Allocation to groups: How is a benefit divided between groups of members? What constitutes a homogenous group of members and what are the key drivers for the grouping?
- Severe events: When is an IORP's national funding position so weak that granting the benefits is considered by the IORP to jeopardize the interests of the IORP or groups of members? How will the mechanism for the benefits be affected by a large change in the funding ratio? How is management / are trustees expected to behave in such a situation?
- Drivers and restrictions: What are the key drivers affecting the level of benefits? What is an IORP's investment strategy? How are benefits made available to members and what are the key drivers affecting for example conditionality, changes in

smoothing practice, level of discretionary benefits provided by the IORP? What other restrictions are in place for determining the level of benefits?

- Expectations: What is an expected level of the benefits? How will the experience from current and previous years affect the level of benefits? How will the expectations regarding years to come affect the level of benefits?

Reduction of benefits

2.5.43. Three types of benefit reductions should be calculated and shown separately on the common balance sheet:

(i) An ex-ante benefit reduction mechanism is a mechanism based on a contract/bylaws, concluded beforehand and which describes precisely under which conditions and to which extent reductions will take place;

(ii) An ex-post benefit reduction is a measure of last resort (i.e. to be used when no other means are available), which may be allowed by national law and regulation;

(iii) A benefit reduction in the event of sponsor default/sponsor insolvency allows for the possibility to reduce pension benefits in the event of a default of the sponsor, in particular in cases when it provides unlimited support and/or when there are not enough assets to cover liabilities. The benefit reduction could occur as part of a transfer to a pension protection scheme or another institution, or as part of a recovery plan of the IORP, if the IORP continues to exist after the default of the sponsor.

Valuation of benefit reductions

2.5.44. The general valuation objective is that the adjustment to technical provisions made in respect of benefit reductions be consistent with the overall valuation methodology of the common balance sheet, involving the valuation of projected future (negative) cash flows on a market consistent basis.

2.5.45. As mentioned in the introduction, benefit reduction mechanisms may be valued using the balancing item approach if there are no limits to the amount of the reductions, as any limitation would mean that there could be instances in which the benefit reduction mechanism would not be able to 'balance the balance sheet'.

2.5.46. By their nature, benefit reduction mechanisms will be the last mechanisms taken into account. Only where all security mechanisms are fully taken into account will benefit reductions be considered. If a benefit reduction mechanism can be recognised as a balancing item on the common balance sheet, other elements of the common balance sheet will then have to be valued using other valuation methods.

2.5.47. A direct approach to the calculation of the value of benefit reduction mechanisms is based on a modelling of future (negative) cash flows. Where the occurrence and amount of benefit reductions are reasonably predictable, probabilities can be assigned to different amounts of reductions to put a total value on the effect of the adjustments.

2.5.48. When there is insufficient data on which to base a more exact modelling a simplified approach could be applied. The objective of a simplification is that the benefit reduction to be valued in the technical provisions will be a best estimate of the average future annual reduction, consistent with the underlying market consistent assumptions. The estimate should take account

of any past and foreseen policies and/or communications to members and beneficiaries that would influence or determine the benefit. There should be consistency between the treatment of benefit reductions and discretionary and conditional benefits, as the economic effect of paying non-unconditional benefits only in economically favourable times is similar to making reductions to unconditional benefits in economically unfavourable circumstances.

Ex ante benefit reductions

2.5.49. IORPs should include the value of ex ante benefit reductions on the common balance sheet in the valuation of the best estimate of technical provisions. The value should be calculated and shown separately from the rest of the best estimate. This way, the best estimate of technical provisions reflects under which conditions and to which extent reductions will take place following from contracts and bylaws.

Ex post benefit reductions

2.5.50. National law and regulation may allow for ex post benefit reductions as a measure of the last resort (i.e. the IORP is no longer able to provide the benefits it originally aimed for or promised).

2.5.51. IORPs should include the value for ex post benefit reductions – when permitted by national law, f.i. in case of default of the IORP, and contractual arrangements - in the valuation of the best estimate of technical provisions. They should be calculated and shown separately from the rest of the best estimate.

2.5.52. Ex post benefit reductions are per definition not explicit and will require an assessment under what circumstances benefits may be reduced and by how much. This assessment could among other things be based on 1) stipulations in national law and regulation, 2) rules or behaviour of the NSA as regards to when reductions are allowed or required, 3) policy behaviour of the management of the IORP, and 4) historical evidence.

Reduction of benefits in case of sponsor default

2.5.53. National law and regulation or contractual arrangements (e.g. collective bargaining) may allow for the possibility to reduce pension benefits in the event of a default of the sponsor that provides unlimited support. This implies that such benefits are conditional on the sponsor continuing to exist.

2.5.54. IORPs should include the value of benefit reductions in case of sponsor default - when permitted by national law and contractual arrangements - in the valuation of the best estimate of technical provisions. The value should be calculated and shown separately from the rest of the best estimate. Two cases can be discerned:

(a) The sponsor provides unlimited support and a pension protection scheme is in place that guarantees a reduced amount of benefits.

(b) The sponsor provides unlimited support and there is no pension protection scheme in place.

In both cases, pensions are reduced in the event of sponsor default when financial assets plus amounts recoverable from the sponsor are insufficient to meet technical provisions.

2.5.55. The value of the reduction of benefits in case of sponsor default can be determined by calculating:

(a) In case (a) above the difference between the value of the pension protection scheme guaranteeing the full level of benefits and its actual value, taking into account the level of financial assets in the IORP.

(b) In case (b) above the difference between the value of sponsor support without default risk and its actual value including default risk.

The spreadsheets provided by EIOPA for the calculation of the simplification for the valuation of pension protection schemes (see 2.8.9 ff.) and simplification 2 for the valuation of sponsor support (see 2.7.62 ff.) automatically calculate the benefit reductions in case of sponsor default for respectively case (a) and case (b).

Valuation of options and guarantees embedded in pension contracts

2.5.56. When calculating the best estimate of technical provisions, IORPs should identify and take into account:

(a) all contractual options and financial guarantees embedded in their schemes and pension rules;

(b) all factors which may affect the likelihood that members will exercise contractual options or the value of the guarantees.

2.5.57. IORPs could ignore an option if exercising the option would be actuarially neutral and second order effects are minimal. This could be the case, for example, if members have an option to choose to have the value of their pension benefits paid out in the form of a lump sum payment at pension date. Second order effects refer to, for instance, the impact of exercising the option on the value of other pension obligations and common balance sheet items. Where future member behaviour is difficult to estimate, as a simplification, the IORP could assume that there are no second order effects.

Definition of contractual options and financial guarantees

2.5.58. A contractual option is defined as a right to change the benefits, to be taken at the choice of its holder (generally the member), on terms that are established in advance. Thus, in order to trigger an option, a decision of its holder is necessary.

2.5.59. A financial guarantee is present when there is the possibility to pass losses to the IORP or to receive additional benefits as a result of the evolution of financial variables (solely or in conjunction with non-financial variables). In the case of guarantees, the trigger is generally automatic (the mechanism would be set in the contract's terms and conditions) and thus not dependent on a decision of the holder. In financial terms, a guarantee is linked to option valuation. The case of defined benefits paid until the death of the beneficiary should not be regarded as an implicit financial guarantee which has to be valued separately as part of the technical provisions.

Valuation requirements

2.5.60. For each type of contractual option IORPs are required to identify the risk drivers which have the potential to materially affect (directly or indirectly) the frequency of option take-up rates considering a sufficiently large range of scenarios, including adverse ones.

2.5.61. When determining the likelihood that members will exercise contractual options, IORPs should take into consideration past member behaviour and a

prospective assessment of expected member behaviour. IORPs should consider whether the following elements are relevant and material for the valuation of options and should take them into account accordingly, applying the principle of proportionality:

- how beneficial the exercise of the options was and will be to the members under circumstances at the time of exercising the option;
- the influence of past and future economic conditions;
- the impact of past and future management actions;
- any other circumstances that are likely to influence decisions by members on whether to exercise the option.

2.5.62. Assumptions for the valuation of options should be realistic. Where it is not possible to determine whether assumptions are realistic, e.g. due to insufficient empirical evidence, assumptions should be chosen such as to avoid underestimation of values. The best estimate of contractual options and financial guarantees must capture the uncertainty of cash flows, taking into account the likelihood and severity of outcomes from multiple scenarios combining the relevant risk drivers.

2.5.63. The best estimate of contractual options and financial guarantees should reflect both the intrinsic value and the time value.

2.5.64. The best estimate of contractual options and financial guarantees may be valued by using one or more of the following methodologies:

- a stochastic approach using for instance a market-consistent asset model (includes both closed form and stochastic simulation approaches);
- a deterministic valuation based on expected cash flows in cases where this delivers a market-consistent valuation of the technical provision, including the cost of options and guarantees.

2.5.65. For the purposes of valuing the best estimate of contractual options and financial guarantees, a stochastic simulation approach would consist of an appropriate market consistent asset model for projections of asset prices and returns (such as equity prices, fixed interest rate and property returns), together with a dynamic model incorporating the corresponding value of liabilities (incorporating the stochastic nature of any relevant non-financial risk drivers) and the impact of any foreseeable actions to be taken by management.

2.5.66. For the purposes of the stochastic approach, a range of scenarios or outcomes appropriate to both valuing the options or guarantees and the underlying asset mix, together with the associated probability of occurrence should be set. A stochastic approach typically uses a large number of projections (scenarios) with attributed probabilities. The number and type of scenarios are not prescribed but should be set so that a market consistent valuation is determined. The range of scenarios should be sufficiently wide, reflecting the range of possible outcomes.

2.5.67. When the valuation of the best estimate of contractual options and financial guarantees is not being done on a contract-by-contract basis, the grouping considered should not distort the valuation of technical provisions.

2.5.68. Regarding contractual options, the assumptions on members'/beneficiaries' or sponsor behaviour should be appropriately founded in statistical and

empirical evidence, to the extent that it is deemed representative of the future expected behaviour.

2.6. Risk margin

2.6.1. Where technical provisions are not calculated "as a whole"[7] IORPs should determine technical provisions as the sum of the best estimate and a risk margin based on the cost-of-capital approach. The determination of the risk margin described in this section follows the approach described in EIOPA's opinion[8], taking into account the assumption that the common balance sheet is either balanced through the use of the balancing item approach or shows an excess of assets over liabilities[9]. The latter may either occur if the value of security and/or benefit reduction mechanisms yields an excess of assets over liabilities when financial assets are lower than liabilities excluding benefit reductions or if financial assets exceed liabilities excluding benefit reductions. Two situations can be distinguished, both in the unstressed and stressed common balance sheet:

IORPs where financial assets are not larger than liabilities (excluding benefit reductions and risk margin)

2.6.2. For these IORPs the risk margin is zero because all risks are borne by security and/or benefit adjustment mechanisms.

All other IORPs

2.6.3. If IORPs have financial assets exceeding liabilities (excluding benefit reductions) then there will be a positive risk margin, because the IORP will have enough financial assets to fully or partly bear all risks itself.

2.6.4. For IORPs with financial assets exceeding liabilities (excluding benefit reductions), the risk margin should be 3% of the best estimate (calculated in accordance with par. 2.4.8) of non-pure DC obligations[10]. If this calculation yields a risk margin which is so large that the common balance sheet shows an excess of liabilities over assets, the risk margin should be determined as (assets – liabilities (excluding risk margin)).

2.7. Sponsor support

2.7.1. Four forms of sponsor support can be distinguished which relate to the support that the sponsor may provide in addition to that committed for financing benefits on an ongoing basis:

A – Increases in contributions

B – Subsidiary liability of the sponsor

C – Contingent assets of the sponsor

D – Claims on the sponsor

2.7.2. Forms A & B can be valued by estimating the future cash flows of the sponsor that could be available to the IORP (Form A), or to pay the benefits directly to members and beneficiaries (Form B).

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[7] See paragraph 2.2.1.

[8] https://eiopa.europa.eu/Publications/Opinions/EIOPA-BoS-16-075-Annex_1_Technical_part.pdf

[9] See paragraph 1.1.9.

[10] See Annex 1 of 2017 Technical Specifications on the Common Balance Sheet, BoS-17-076v2_Annex_TS_IORP_Stress_Test_2017.pdf

2.7.3. For reasons of simplicity the wording in the text below often takes into account Form A (payments to the IORP) only, but is meant to capture Form B (payments to members and beneficiaries) as well.

2.7.4. Form C relates to contingent assets of the sponsor. These assets are still in the possession of the sponsor at the valuation date, but are locked in a legally binding way for the purpose of flowing to the IORP under a predefined set of circumstances.

2.7.5. Contingent assets of the sponsor should be recognised separately on the common balance sheet and valued in accordance with the principles laid down in section 2.12 applying to the valuation of financial assets of IORPs. Where appropriate, the value of contingent assets should be deducted from the value of sponsor support where it would result in double counting.

2.7.6. Form D relates to claims on the sponsor on discontinuance of the IORP. In essence this form of support is what would be available to the IORP if the link between the IORP and the sponsor is broken.

Overarching principles valuation

2.7.7. Sponsor support should be valued on a market-consistent basis where the value of the sponsor support should be calculated as the probability weighted average of the discounted value of future cash flows that is expected to be paid by the sponsor in possible future scenarios.

2.7.8. A one-size-fits-all methodology to the valuation of sponsor support is not possible as the position of sponsors can vary significantly and the appropriate approach for one type of sponsor may not be appropriate for another - for example, understanding the affordability position of a commercial sponsor will require very different analysis to that of a sponsor in the not-for-profit sector. The specifics of how IORPs should do this are left to IORPs and NSAs to decide on the most appropriate approach.

Valuation approach

2.7.9. The value of sponsor support should be calculated as the probability weighted average of the discounted value of future cash flows, that would be required to be paid by the sponsor to the IORP in excess of its regular contributions for funding the cost of new accrual, in order to ensure assets in the IORP meet a required level (i.e. the gap between the total of all other assets of the IORP and the assumed target level of total assets). Where sponsor support is limited by contract or otherwise, the limit should be taken into account in the calculation of cash flows. Where the cost of new accrual is valued as part of the technical provisions (see section 2.5) IORPs may use their current policy as the basis for valuing the required contributions for future accrual. The risk free interest rate curve should be used for discounting cash flows.

2.7.10. The valuation of sponsor support should be consistent with the general principles and assumptions outlined in section 2.4 with respect to the incorporation of:

- Assumptions consistent with information provided by financial markets;
- Members/beneficiaries or sponsor behaviour;
- IORP management actions;
- Expert judgement.

2.7.11. This approach may use elements of various modelling techniques (i.e. probabilistic or deterministic) relevant to the IORP's specific circumstances and overlaid with expert judgment relating to the specific circumstance of the sponsor.

2.7.12. In some circumstances a balancing item approach (see 2.7.41 ff.) may be applied, such that the value of sponsor support is simply the required amount to balance the common balance sheet. Then a detailed approach to valuing sponsor support may not be needed. Application of the balancing item approach requires, among other things, that the strength of the sponsor is sufficient.

Contributions and timing of cash flows

2.7.13. Future contributions to be included in the valuation of sponsor support should be consistent with the following rules:

(i) Only contributions in excess of the cost of new accruals should be taken into account – see "Benefits and contributions to be included in cash flows" section 2.5.

(ii) Only future additional contributions with respect to existing obligations and accrued rights included in the best estimate of technical provisions at the calculation date shall be taken into account.

(iii) Both contributions paid by the employer(s) and employees should be taken into account where employees can be required to make additional contributions. The credit risk associated with employee contributions can be assumed to be the same as for the associated employer(s).

(iv) Possible restitutions (i.e. negative contributions) by the IORP to the employer(s) and employees in favourable scenarios should be taken into account where legislation allows for this.

2.7.14. IORPs should consider the timing of sponsor support when making projections of future cash flows. The distribution of sponsor support over time may depend on the pension contract and / or social and labour law.

Legally and non-legally enforceable sponsor support

2.7.15. The value of legally and non-legally enforceable sponsor support should be determined and reported separately on the common balance sheet. Sponsor support is legally enforceable if the sponsor is legally obliged to make additional payments to the IORP and/or the members and beneficiaries and the IORP and/or the members and beneficiaries can compel the sponsor to fulfil its obligations in that respect. The obligation could be laid down in national social and labour law or in a contractual agreement between IORP and plan sponsor or between plan sponsor and members and beneficiaries. Sponsor support is non-legally enforceable if there is no legal or contractual obligation to provide sponsor support.

Probability of occurrence of future sponsor support

Overarching approach

2.7.16. The probability of occurrence and default risk of future support of the sponsor to the IORP including any recoverables should be taken into account in order to derive the probability weighted expected value. In order to do this it is important to take into account two key elements.

2.7.17. Firstly, the ability of the sponsor to make payments that includes the financial position of the sponsor and also its credit risk (financial constraints). When deriving the amounts and probabilities of future sponsor support cash flows, IORPs should appropriately take into account their own financial situation, as well as the quantitative uncertainty of this situation.

2.7.18. Secondly, the ability of the IORP/NSA to demand payments from the sponsor (legal constraints).

2.7.19. Where sponsor support is non-legally enforceable, IORPs should take into account the likelihood of their sponsor(s) providing additional resources in future scenarios and be in a position to demonstrate to their NSA the appropriateness of the modelling assumptions used for this purpose. This could be done, for example, by adjusting the default probability of the sponsor to reflect the additional risk that the sponsor may not provide the required cash flows. Where this is not possible, IORPs should use the sponsor's unadjusted default probability and report the result as non-legally enforceable sponsor support in the spreadsheets. Elements that could play a role in this assessment are the current financial strength of the sponsor, the level of cyclicality with economic scenarios of the sponsor's activities and the accounting consequences for the sponsor in case he would provide additional resources. IORPs should take into account past experience when assessing the likelihood of non-legally enforceable sponsor support being available. The value of non-legally enforceable sponsor support should be calculated and shown separately on the common balance sheet.

Sponsor default probabilities

2.7.20. IORPs should use whatever method is most appropriate for their circumstances to derive the default probability for their sponsor. IORPs should take into account how the default probability will change over time. In case this is too difficult or burdensome, IORPs may assume that the probability of default remains constant over time.

2.7.21. To help IORPs assess the sponsor default probability, below methodologies may be used:

2.7.22. Option 1 – IORPs may use probabilities as implied by securities traded on financial markets, such as credit default swaps and corporate bonds.

2.7.23. Option 2 - Probability of default assessed according to the sponsor's credit rating. The following table[11] can be used to derive a suitable default probability from a sponsor's credit rating.

Rating	Credit Quality Step	PD
AAA	0	0.002%
AA	1	0.01%
A	2	0.05%
BBB	3	0.24%
BB	4	1.20%

[11] The table is aligned with the table included in Article 199 paragraph 2 of Commission Delegated Regulation (EU) 2015/35.

B	5	4.20%
CCC or lower	6	4.20%

2.7.24. Option 3 - IORPs can use data from their sponsors' financial accounts to derive a suitable default probability. IORPs may apply the first stage of the Alternative Simplified Approach (see paragraph 2.7.75) to derive an approximate credit rating. This approach is also possible for smaller and/or unrated sponsors. The above table can then be used to derive the probability of default. IORPs from the UK can use probabilities calculated by the UK Pension Protection Fund.[12]

Recovery rate on sponsor default

2.7.25. The recovery rate of claims on the sponsor in the event of default of the sponsor should not exceed 50%. If IORPs have evidence as to why a different recovery rate would be more appropriate in their circumstances including for example allowing for the different recovery rates from different insolvency processes in different member states, this can be used. In particular, for some member states, a much smaller figure might be more appropriate under the circumstances in which insolvency occurs. IORPs should be able to demonstrate the appropriateness of the recovery rate used.

Scope of guarantees

2.7.26. In cases where there are legally enforceable guarantees protecting the sponsor and/or the support provided by it to an IORP, whether granted by other group- or parent-companies of the sponsor, or by third parties such as credit insurance, bank guarantees or government guarantees, those guarantees should be taken into account when calculating the value of sponsor support. Calculations for valuing sponsor support should in this case be done in the same way as for "standard" sponsor support, but taking into account the financial strength and data of the respective guarantor(s). If the guarantee covers the full sponsor support, replacing the sponsor with the guarantor in calculating sponsor support will probably simplify the procedure, as the guarantor may be more likely to have a credit rating and there may be more easily available data for assessing credit quality. Where information from the sponsor (or from the sponsor's accounts) is available on any material commitment of those guarantors towards other IORPs, as well as other on- or off-balance commitments, these should be taken into account, in order to avoid any multiple gearing. Where information on other commitments is not available or is likely to be immaterial, IORPs may ignore it.

Maximum value of sponsor support

Approach

2.7.27. In order to ensure that the valuation of sponsor support does not exceed an amount that the sponsor could reasonably afford, IORPs should derive an approximation of the maximum value of sponsor support.

2.7.28. This value is also used to test Condition 1 and Condition 2 of the balancing item approach (see paragraph 2.7.41 ff. below).

[12] http://www.pensionprotectionfund.org.uk/DocumentLibrary/Documents/1516_insolvency_risk_appendix.pdf

2.7.29. Where sponsor support is contractually limited to a certain value in some way, the value of maximum sponsor support should not exceed this limit.

Principles for valuation

2.7.30. IORPs are free to choose the most appropriate approach to the valuation of maximum sponsor support for their IORP. The aim of this assessment is to determine the maximum support the sponsor may be reasonably able to provide the IORP over an appropriate period of time.

2.7.31. IORPs can take a proportionate approach to the valuation. For example, where the sponsor is extremely strong and the relative size and risk of the IORP is small, a simple approach can be taken to valuing maximum sponsor support. This is left to IORPs to decide on and they should be in a position to justify the approach they have taken.

2.7.32. The approach to valuing maximum sponsor support will depend on the information available to the IORP from the sponsor and/or from the sponsor's accounts.

2.7.33. Where IORPs have credible and sufficient information regarding the future business plans of the sponsor that will affect the estimation of future cash flows, then this should be taken into account.

2.7.34. In practice, the IORP should be able to demonstrate to the NSA the validity of the assumptions and analysis used in this assessment.

Simplification

2.7.35. In general, valuing maximum sponsor support will involve valuing two broad components:

(a) the wealth (or surplus) of the sponsor currently available for the IORP;

(b) the wealth which can be foreseen to be made available for the IORP through future cash flows of the sponsor.

2.7.36. As a simplification, IORPs may take an approach that combines the valuation of these two areas accounting for any appropriate adjustments for double counting – for example where items valued on the balance sheet of the sponsor are present values of items included in future cash flow projections.

2.7.37. A user tab spreadsheet is available to carry out the calculation of maximum sponsor support using the below simplified approach. The below inputs are required for the calculation. The value of these is being left to IORPs to decide on what is the most appropriate for their sponsors. Also, there are differing metrics which IORPs may use for the current and future wealth (e.g. EBITDA, profits before taxes (PBT), shareholder funds) which is up to the IORP to decide on. For non-profit or charitable sponsors, 'operating profit' type metrics may need to be replaced with 'operating surplus' metrics.

2.7.38. When using metrics from the sponsor's accounts, there may be a time lag between reporting and the date of this exercise. IORPs may ignore this unless there is evidence that the metrics require significant adjustment to allow for events since the data was reported. IORPs will need to use expert judgement in these scenarios as to how to adjust the data.

d = The number of future years for which sponsor support cash flows are included in the assessment.

it = Discount factor for year t.

ECt = Expected sponsor cash flow at year t. This figure should be the sum of:

(i) current recovery plan contributions extended to year d;

(ii) a fixed percentage (which may be set to zero) of the expected future cash flows (e.g. EBITDA, PBT) from the current year to year d, adjusting for any double counting.

Z = The wealth (or surplus) of the sponsor (e.g. shareholder funds).

ξ = Proportion of this wealth that is available for the IORP (which may be set to zero).

y = The value of the liabilities already accounted for in the sponsor accounts (using IFRS where applicable or the national accounting standards).

Lim M_{ss} = Any contractual limit on the maximum value of sponsor support available. If there is no limit, this value can be ignored.

Output

2.7.39. This delivers the following output:

M_{ss} = Maximum value of sponsor support.

Calculation

2.7.40. The formula to be used to derive the maximum value of sponsor support is as follows. In carrying out this calculation a spreadsheet is provided by EIOPA meaning that only the inputs will be required from IORPs.

Maximum value of sponsor support

$$Mss = Min(LimM_{SS}; \sum_{t=1}^{d} i_t \cdot EC_t + (\xi \cdot z + y))$$

Balancing item – legally enforceable, unlimited sponsor support

2.7.41. The balancing item approach is only possible where sponsor support is legally enforceable and unlimited in nature. In addition, IORPs have to comply with one of the below conditions to be eligible to use the balancing item approach.

Balancing item - Condition 1

2.7.42. As a first sub-condition, the default rate of the sponsor should be 0.5% or lower.

2.7.43. In addition, the IORP should be able to demonstrate that the sponsor has sufficient financial strength to cover the value of sponsor support required to balance the stressed common balance sheet. For this purpose, the "value required to balance the common balance sheet" should be taken equal to (liabilities – financial assets on the stressed common balance sheet). This sub-condition would be fulfilled if the value required to balance the stressed common balance sheet would not exceed the maximum value of sponsor support. The liability should be the value of the liabilities in the common balance sheet.

2.7.44. If these two sub-conditions are fulfilled, sponsor support can be included in the common balance sheet as a balancing item.

Balancing item - Condition 2

2.7.45. Under this condition, the IORP needs to assess whether the maximum value of sponsor support (or the equivalent in the case of multi-employer IORPs) is larger than twice the value (of sponsor support) required to balance the stressed common balance sheet. For this purpose, the "value required to balance the stressed common balance sheet" should be taken equal to (liabilities – financial assets on the stressed common balance sheet). The liability should be the value of the liabilities in the common balance sheet.

2.7.46. If this condition is fulfilled, sponsor support can be included in the common balance sheet as a balancing item.

Multi-employer IORPs

2.7.47. For multi-employer IORPs where the calculation of the above mentioned figures for every single employer is not possible or would be too burdensome for the IORP, it is sufficient to make the calculations only for a sufficient number of (larger) employers for which data is available. If these results can be seen as being representative for all employers they can be grossed up to the level of all employers appropriately.

2.7.48. Alternatively, for example where the IORP is sponsored by a large amount of small sponsors, it could be sufficient in the first step to determine the value of a sample of sponsors which collectively have a value larger than a multiple of the value of sponsor support included in the common balance sheet. One approach would then be to use a sample of, for example, the five largest sponsors which cover a specified percentage of the members of the IORP. But this approach could be modified, for example if there is a problem with availability of data. In this case the sample could be chosen in a different way.

2.7.49. In cases where a second step would be necessary, if the sponsor support is not deemed very strong, the "normal" assessment of the maximum value of sponsor support could also be restricted to a sample of sponsors, which would provide a maximum value of sponsor support which is (collectively) assessed as larger than the value necessary to balance the common balance sheet.

Multi IORP sponsors

2.7.50. For sponsors with multiple IORPs, IORPs should be able to use all of the sponsor support valuation approaches, subject to data availability, by using the same principles but adapted to the multiple IORP situation by taking account of the proportion (which might be considered to relate to each IORP of the sponsor) of what would be the maximum sponsor support of the sponsor if there were only one IORP. This information should be available from the sponsor and/or sponsors accounts. Where IORPs are unable to collect this data and/or it is regarded as immaterial, it can be ignored for the purpose of this exercise.

Simplifications for the valuation of sponsor support

2.7.51. IORPs are requested to perform their own calculations using a stochastic modelling approach. However, EIOPA recognises that many IORPs may not have access to such modelling techniques, or it may be too burdensome or costly to apply such an approach. IORPs may therefore develop their own simplified approaches consistent with the principles for valuation of sponsor support. EIOPA is also providing IORPs with a number of simplified modelling approaches and spreadsheets.

2.7.52. These simplifications which are described in detail below, are:

1. Simplification 1 – Simplified distribution approach
2. Simplification 2 – Deterministic cash flow approach
3. Simplification 3 – Alternative Simplified Approach (ASA)

2.7.53. The first two of these approaches require the ability of the sponsor to afford those payments to be taken into account through the use of maximum sponsor support (see 2.7.27 ff.) as an input. IORPs should therefore ensure that the payments modelled are affordable to avoid overstating the valuation of sponsor support.

2.7.54. The Alternative Simplified Approach does not require the use of maximum sponsor support since it takes into account the affordability position of the sponsor implicitly in the model.

2.7.55. EIOPA recognises that these simplifications represent a standard methodology for valuing sponsor support and the individual circumstances of employers and IORPs can differ. If the IORP considers that these simplifications will lead to a significant misestimating of the value of sponsor support, due to a particular characteristic of the sponsor support arrangement or the sponsor itself that are not appropriately reflected, the IORP should carry out its own valuation of sponsor support, which should be consistent with the general principles set out in this section.

Simplification 1 - Valuation of sponsor support (Simplified distribution approach)

2.7.56. This simplification uses the best estimates for the assets and technical provisions and the maximum sponsor support to derive an estimate for sponsor support allowing for assumptions (within the simplification model) for the modelled volatility of the results. In carrying out this calculation a spreadsheet is provided by EIOPA meaning that only the inputs will be required from IORPs.

2.7.57. This method implements the following calculations[13]:

- Step 1: calculation of the estimated probability distribution of the eventual need for sponsor support in a run-off situation (= the final value of all payments made to the beneficiaries – the final value of all assets used to pay the pensions)
- Step 2: calculation of the estimated probability distribution of the actual support provided by the sponsor to the IORP, conditional on an absence of default of the sponsor. This distribution is obtained from the distribution in step 1 by applying:
  - a cap equal to the maximum sponsor support as calculated above
  - a floor equal to 0, if and only if the sponsor is never able to reduce its future contributions nor to take some assets back from the IORP, even in overfunding situations
- Step 3: calculation of the expected value of support received from the sponsor, without accounting for the default probability of the sponsor
- Step 4: the value obtained in step 3 is adjusted for the default risk of the sponsor, taking into account the expected timeframe of payment of the sponsor support (under the assumption that annual payments are all equal), the annual probability of default of the sponsor, and the recovery rate in case of default of the sponsor.

[13] See Annex 2 of 2017 Technical Specifications on the Common Balance Sheet, BoS-17-076v2_Annex_TS_IORP_Stress_Test_2017.pdf

Input

2.7.58. This method requires the following input:

TP: the value of technical provisions, calculated according to sections 2.2-2.6.

A : the market value of investment assets, valued according to section 2.12.

σ_A : the relative standard deviation of assets.

2.7.59. This factor corresponds to the ratio between the standard deviation of the value of assets and the value of assets itself. The relative standard deviation (RSD) value shall be positive. The relative standard deviation depends on the actual composition of the portfolio of assets:

- for a pure risk free asset, the RSD is 0
- for a fixed income bond, it might be between 0 and 25%, depending on the rating of the bond
- for equity, it might be between 40% and 60%

IORPs are asked to derive the appropriate value depending on their asset portfolio. Alternatively, for the purposes of this exercise, IORPs can use a value of 30%.

σ_{TP}: the relative standard deviation of technical provisions.

This factor corresponds to the ratio between the standard deviation of technical provisions and technical provisions itself. The RSD value shall be positive. The relative standard deviation should take into account all elements of uncertainty in technical provisions, including:

- actual mortality rates vs. assumed rates used for the calculation of technical provisions
- sampling error
- actual rates of expense vs. assumed rates used for the calculation of technical provisions
- loss sharing and conditional benefits

For the purposes of this exercise, IORPs can use a value of 10%.

σss : the relative standard deviation of support needed (support needed defined as the difference between the assumed target level and the level of assets, this is calculated automatically by the provided spreadsheet)

ρ : the expected correlation between assets and liabilities.

This factor, between -100% and 100%, aims at capturing how the value of assets and pension liabilities vary together.

- For a DB scheme without any possibility of reduction of benefits, this parameter should be 0.
- For a pure DC scheme, this value should be 100%.
- For DB schemes with some conditional or discretionary benefits, the value should be in-between, depending on the part of variance of technical provisions explained by financial profit sharing within the global variance of technical provisions. For the purposes of this exercise, IORPs can use a default value of 30%.

M_{ss} : the maximum value of sponsor support.

d : the expected duration of settlement of the sponsor support (when needed).

This duration should correspond to the time (in years) the sponsor will have to pay to the IORP the full amount of required support. It should be the same as the one used in the calculation of maximum sponsor support. For the purpose of this exercise, this should be equal to the value of the average duration of the expected outgoing cash flows of the IORP relating to obligations as at the valuation date.

p_{def} : the annual probability of default of the sponsor.

RR : the expected recovery rate of sponsor support in case of default of the sponsor (see paragraph 2.7.25).

Calculation

2.7.60. If the sponsor cannot, in any case, withdraw any assets from the IORP, nor suspend its contribution to the IORP in case of overfunding, then the market consistent/fair value SS_{fv} of the sponsor support to the IORP is given by the following formula. In carrying out this calculation a spreadsheet is provided by EIOPA meaning that only the inputs for this calculation will be required from IORPs.

$$SS_{fv} = SS_{exp}.Adj_{def}$$

where

$$SS_{exp} = \mu_{ss} + Adj_{exp}$$

$$\mu_{ss} = TP - A$$

$$\sigma_{ss} = \sqrt{(\sigma_A.A)^2 + (\sigma_{TP}.TP)^2 - 2\rho.A.TP.\sigma_A.\sigma_{TP}}$$

$$Adj_{exp} = -\left[(\mu_{ss} - M_{ss}).\left(1 - \Phi\left(\frac{M_{ss} - \mu_{ss}}{\sigma_{ss}}\right)\right) + \sigma_{ss}.\varphi\left(\frac{M_{ss} - \mu_{ss}}{\sigma_{ss}}\right)\right] - \left[\mu_{ss}.\Phi\left(-\frac{\mu_{ss}}{\sigma_{ss}}\right) - \sigma_{ss}.\varphi\left(\frac{\mu_{ss}}{\sigma_{ss}}\right)\right]$$

and

$$Adj_{def} = \frac{1}{d}\left[(1 - RR)(1 - p_{def})\left(\frac{1 - (1 - p_{def})^d}{p_{def}}\right) + d.RR\right]$$

Φ and φ are respectively the cumulative and non-cumulative Gaussian distribution functions with average 0 and variance 1.

2.7.61. If the sponsor can, in some cases, withdraw assets from the IORP, or suspend its contribution to the IORP (for instance in cases of overfunding), the same formula as above should be used, but using the following value for Adj_{exp}. Again, in carrying out this calculation a spreadsheet is provided by EIOPA meaning that only the inputs will be required from IORPs.

$$Adj_{exp} = -\left[(\mu_{ss} - M_{ss}).\left(1 - \Phi\left(\frac{M_{ss} - \mu_{ss}}{\sigma_{ss}}\right)\right) + \sigma_{ss}.\varphi\left(\frac{M_{ss} - \mu_{ss}}{\sigma_{ss}}\right)\right]$$

Simplification 2 – Valuation of sponsor support (deterministic cash flow with credit haircut)

2.7.62. This simplification is designed to provide a methodology for valuing sponsor support by taking the probability weighted average of future cash flows, where the only source of uncertainty is the default risk of the sponsor. This generates a probability tree in which each year the sponsor may default or not default.

2.7.63. For this valuation, returns on all assets are assumed to be equal to the risk-free interest rate.

2.7.64. Sponsor contributions and receipts are assumed to be symmetric, i.e. the sponsor contributes to recover shortfalls, but also receives any surpluses. This does not necessarily mean that the sponsor should be able to claim surpluses at any given time. A sufficient condition is that surpluses are ultimately reimbursed.

Input

2.7.65. Required inputs:

TP: the value of technical provisions, calculated according to sections 2.2-2.6.

A: the market value of investment assets, valued according to section 2.12.

d: the expected duration of settlement of the sponsor support.

This duration should correspond to the time (in years) the sponsor will have to pay to the IORP the full amount of required support. It should be the same as the one used in the calculation of maximum sponsor support. For the purpose of this exercise, this should be equal to the value of the average duration of the expected outgoing cash flows of the IORP relating to obligations as at the valuation date.

i: interest rate which should reflect the appropriate risk free rate for the duration d. i can also be based on/taken from the risk free interest rate curve.

pdef : the annual probability of default of the sponsor.

RR : the expected recovery rate of sponsor support in case of default of the sponsor (see paragraph 2.7.25).

Mss : the maximum value of sponsor support.

Output

2.7.66. This simplification yields the following output:

SSFV: market value (fair value) of sponsor support

Calculation

2.7.67. In carrying out this calculation a spreadsheet is provided by EIOPA meaning that only the inputs to the calculation will be required from IORPs.

2.7.68. The market value of sponsor support is determined by the following formula:

$$SS_{FV} = (TP - A)\sum_{t=1}^{d}(1-p_{def})^{t}\frac{1}{d} + (1-p_{def})^{t-1}p_{def}\,RR\left[1-\frac{t-1}{d}\right]$$

2.7.69. If the calculated value of unlimited sponsor support exceeds the maximum value of sponsor support then the market value should be set equal to the maximum value.

2.7.70. The formula for the market value of sponsor support can be derived by taking the probability weighted average of the discounted value of payments to the IORP during the duration of the settlement in the event the sponsor does and does not default. The annual payment to the IORP is assumed to be a constant annuity in present value terms to recover the shortfall in assets given the discount rate and the duration of the settlement.

Simplification 3 – Valuation of sponsor support (ASA)

2.7.71. This simplification is designed to provide a methodology for valuing sponsor support based on an alternative approach to assessing the adjustment to be made for sponsor credit risk using sponsor credit ratios. The aim of this simplified approach is to provide IORPs – in particular small and medium-sized ones – with a practical and proportionate tool to do a sponsor support valuation.

2.7.72. The method as set out is applicable to IORPs with unlimited sponsor support, since the calculation is based on the shortfall between the financial assets and the technical provisions. However it could be adapted by IORPs who have limited sponsor support by reducing the value of the shortfall to be met by the sponsor support in the light of any legal limit.

2.7.73. To carry out this calculation, EIOPA has provided a helper tab spreadsheet, so IORPs only have to insert the required inputs

2.7.74. This simplification consists of the following stages. IORPs need only provide the input data as in paragraph 2.7.82 below.

2.7.75. **Stage 1**. IORPs should use financial credit ratio techniques to assess the strength of the sponsor support relative to their financial obligations as valued in the common balance sheet on a six step credit quality scale from "very strong" to "very weak".

2.7.76. The helper tab spreadsheet sets out a simplified way of doing this, using only four data input items which then are used to calculate the required two ratios and from these then derive the assessment on the 1-6 scale.

2.7.77. IORPs may consider that the specific ratios do not lead to a suitable assessment of their sponsor. The helper tab allows IORPs to choose and insert a scale value themselves.

Sponsor Strength – Credit ratio matrix							
		Income cover					
		<1	1x	3x	5x	7x	9x+
Asset Cover	9x+	Strong	Strong	Strong	Very Strong	Very Strong	Very Strong
	7x	Medium strong	Medium strong	Strong	Strong	Very Strong	Very Strong
	5x	Medium	Medium strong	Medium strong	Strong	Strong	Very Strong

	3x	Weak	Medium	Medium strong	Medium strong	Strong	Strong
	1x	Very Weak	Weak	Medium	Medium strong	Medium strong	Strong
	<1x	Very Weak	Very Weak	Weak	Medium	Medium strong	Strong

2.7.78. **Stage 2**. Based on that scale value for the strength of the sponsor, the spreadsheet calculates a factor which can be applied to the shortfall in the common balance sheet to allow for the credit risk of the sponsor. This is done by:

1. Setting the period over which the sponsor could reasonably afford to make the payments to meet the required funding level. For very strong sponsors, this is a very short period. For very weak sponsors, this is assumed to be a longer period.

2. Setting the assumed annual probability of default for the sponsor i.e. the probability that the sponsor will not pay the contributions to the IORP.

3. Calculating the level of annual contributions required to meet the required funding level. If this gives rise to an inappropriate level of annual contributions (e.g. because local regulations do not allow contributions above or below pre-defined limits) then the assumed period for these contributions can be adjusted

4. Calculating the value of sponsor support as the present value of these contributions, adjusted to allow for the default risk of the sponsor.

2.7.79. The table above summarises these factors and the resulting reduction in the sponsor support to allow for credit risk.

2.7.80. Under this simplification, there is no need to:

- Calculate a maximum value of sponsor support; or
- Use external credit ratings to determine probabilities of default.

2.7.81. The helper tab can in principle be used to assess any extra value of support available from any other entities that the legal sponsor may be associated with (e.g. parent companies), by changing the shortfall in the common balance sheet to the amount not covered by the legally enforceable sponsor support and assessing the value which may be available from such other sources.

<u>Input</u>

2.7.82. Required inputs:

To assess the strength of the sponsor the following data input items are required (IORPs may use expert judgement in selecting the most suitable metrics for this purpose). When using metrics from the sponsor's accounts, there may be a time lag between reporting and the date of this exercise. IORPs may ignore this time lag unless there is evidence that the metrics require significant adjustment to allow for events since the data was reported. IORPs will need to use expert judgement in these scenarios as to how to adjust the data.

(a) Net cash flow (Profits before taxes (PBT) may be used or another equivalent measure of cash flow depending on the nature of the IORPs sponsor);

(b) Annual service cost (including interest on debt, rental payments, and the IORP deficit reduction contributions);

(c) Net Asset value of the sponsor (e.g. shareholder funds);

(d) Deficit (shortfall between the financial assets and the technical provisions).

Output

2.7.83. The simplification produces the value of sponsor support in the common balance sheet.

Calculation

2.7.84. As stated above, the helper tab spreadsheet uses the accounting and IORP funding data to calculate the strength of the sponsor on a scale from 1 to 6 (i.e. from "Strong" to "Very Weak").

2.7.85. That scale score then defines the other key assumptions for the assumed default probability for the sponsor and the recovery plan period. Those assumptions are then used, together with the discount rates from the yield curve, to calculate the haircut to be applied to the implied recovery plan needed to meet the level of underfunding on the common balance sheet.

2.7.86. The table below shows the assumptions used and the level of the haircut based on assuming a discount rate of 3%. The relevant yield curve will be used in the helper tab so the resulting haircuts may differ slightly from those shown in this table.

Allowance for the credit risk in valuation of sponsor support using Simplification 3					
Credit step	Definition	Broadly equivalent credit rating	Recovery Plan period (years)	Annual probability of insolvency (%)	Value of Sponsor Support as % of common balance sheet financial shortfall (%)
1	Very strong	AAA/AA	3	0.1	99.9
2	Strong	A	3	0.2	99.7
3	Medium strong	BBB	5	0.5	98.8
4	Medium	BB	10	1.6	92.9
5	Weak	B	20	4.5	68.3
6	Very Weak	CCC	30	26.8	14.7

2.8. Pension protection schemes

2.8.1. This section is only relevant for IORPs in member states where a pension protection scheme is in place.

2.8.2. Where a pension protection scheme does not cover full members' benefits it cannot provide certainty that the full benefits will be paid, but only provides for certainty that a defined minimum level (the protected level) of benefits will be paid. Benefits above those payable by the pension protection scheme are then only payable based on the availability and limitation of the IORPs other assets and security mechanisms.

2.8.3. This would mean that the members' benefits between those covered by the pension protection scheme and those that would be paid if the pension protection scheme was not required, are conditional on the availability of other assets and security mechanisms, consistent with the definition of conditional benefits above.

2.8.4. The value of future benefits guaranteed by the pension protection scheme at the time of default can be approximated by reference to the value of technical provisions. For example, if the pension protection scheme guarantees benefits for a full 100% then the present value equals the value of technical provisions. If the pension protection scheme guarantees benefits for (say) 90% then the present value equals 90% of the value of technical provisions at that time. In the valuation of technical provisions, the scenarios in which benefits below the full value are paid are taken into account in the best estimate of the liabilities (see paragraph 2.5.53-55).

Valuation as an asset on the common balance sheet

2.8.5. IORPs should value pension protection schemes on a market consistent basis by taking the probability weighted average of discounted future cash flows to be paid by the pension protection scheme to support the protected level of benefits.

2.8.6. In principle, the valuation should take into account:

- The probability of default of the sponsor, as derived for the valuation of sponsor support (see paragraph 2.7.20-24);
- The level of benefits the pension protection schemes guarantees in the event of default of the sponsor;
- The level of funding of the IORP at the time of default of the sponsor, i.e. financial assets plus recoverables from the sponsor, as derived for the valuation of sponsor support (see paragraph 2.7.25).

Balancing item approach

2.8.7. A pension protection scheme that guarantees 100% of benefits should be recognised as a balancing item on the common balance sheet, provided it fulfils the following criteria with regard to the certainty and permanence of the legal arrangement and the financial strength of the pension protection scheme:

- Certainty and permanence of the legal arrangement of the pension protection scheme: The legal arrangement could be considered certain, if it is based on national law and if the protection provided by the pension protection scheme is legally enforceable. The payment of contributions/levies to the pension protection scheme should be legally enforceable by the pension protection scheme, with no possibility of those required to pay those contributions/levies to "opt out" of the protection provided by the pension protection scheme and the obligation to pay contributions/levies. If the legal arrangement is based on national law then it should also be considered sufficiently permanent, because national law cannot be changed

by the parties involved in the arrangement, but only by the appropriate national body (usually parliament), which will consider possible effects on members and beneficiaries, IORPs, and sponsors;

- Financial strength of the pension protection scheme: A pension protection scheme should be considered financially strong, if the pension protection scheme can enforce the payment of levies/contributions and if the financial strength of the sponsors obliged to pay those levies/contributions is considered high (e.g. because those sponsors represent a large part of a national economy, which is considered itself as strong).

2.8.8. NSAs may provide guidance to IORPs regarding the question whether those criteria are met and consequently the balancing item approach can be used for valuation of the pension protection scheme.

Simplification – Value of pension protection scheme

2.8.9. For pension protection schemes that do not qualify for the balancing item approach, IORPs may use the following simplification to determine the value of the pension protection scheme.

2.8.10. This valuation follows the principles used in the deterministic valuation of sponsor support (Simplification 2) and a spreadsheet is provided meaning that only the inputs are required from IORPs.

Input

2.8.11. There is one input required in addition to the inputs needed in the second simplification for a deterministic valuation of sponsor support.

CR: the coverage rate of the pension protection scheme.

For example, if the pension protection scheme guarantees 90% then the coverage rate equals 90%. If the amount payable from the pension protection scheme changes over time or if the pension protection scheme guarantees a fixed percentage but limits the amount payable in other ways, IORPs can allow for this using a suitable approximation method.

Calculation

2.8.12. The market value (fair value) of the pension protection scheme is determined by the following formula:

$$PPF_{FV} = \sum_{t=1}^{d} (1 - p_{def})^{t-1} p_{def} \cdot max \left[CR\,TP - \left\{ A + \frac{t-1}{d}(TP - A) + RR(TP - A)(1 - \frac{t-1}{d}) \right\};\ 0 \right]$$

2.8.13. According to this formula, the value of the pension protection scheme equals the sum over time of the (cumulative) probability of sponsor default multiplied by the value of payments to be made by the pension protection scheme if that occurs. The value of these payments is equal to the value of benefits covered – approximated by the coverage rate multiplied by the value of technical provisions – minus the initial value of financial assets, the sponsor payments made prior to default and the funds recovered from the sponsor after default. The value of payments to be made by the pension protection scheme cannot be negative. If the total value of financial assets after default exceeds the value of benefits covered then no payments have to be made by the pension protection scheme.

2.8.14. The formula does not take into account the possible default of the sponsor through limiting the value of sponsor support to the maximum value of sponsor support. However, the spreadsheet implementing this simplification increases the value of the pension protection scheme with the amount by which the value of sponsor support was capped through the imposition of maximum sponsor support, taking into account the coverage rate of the pension protection scheme.

2.9. Recoverables from (re)insurance contracts and special purpose vehicles (SPVs)

2.9.1. IORPs should include the value of recoverables from (re)insurance contracts and SPVs as an asset on the common balance sheet.

2.9.2. The calculation by IORPs of amounts recoverable from (re)insurance contracts and SPVs should follow the same principles and methodology for the calculation of technical provisions.

2.9.3. There is no need however to calculate a risk margin for amounts recoverable from (re)insurance contracts and SPVs because only one net calculation of the risk margin should be performed, rather than two separate calculations (i.e. one for the risk margin of the technical provisions and one for the risk margin of recoverables from (re)insurance contracts and SPVs).

2.9.4. When calculating amounts recoverable from (re)insurance contracts and SPVs, IORPs should take account of the time difference between recoveries and direct payments.

2.9.5. Where for certain types of (re)insurance and SPVs, the timing of recoveries and that for direct payments of IORP markedly diverge, this should be taken into account in the projection of cash flows. Where such timing is sufficiently similar to that for direct payments, the IORP should have the possibility of using the timing of direct payments.

2.9.6. The amounts recoverable from (re)insurance contracts and SPVs should be calculated consistently with the rules on benefits and contributions to be included in cash flows relevant for the contracts to which the amounts recoverable from (re)insurance contracts and SPV relate.

2.9.7. For the purpose of calculating the amounts recoverable from (re)insurance contracts and SPVs, the cash flows should only include payments in relation to compensation of pension obligations. Other payments should not be accounted as amounts recoverable from (re)insurance contracts and SPVs. Where a deposit has been made for the mentioned cash flows, the amounts recoverable should be adjusted accordingly to avoid a double counting of the assets and liabilities relating to the deposit.

2.9.8. Debtors and creditors that relate to settled claims of members or beneficiaries should not be included in the recoverable.

2.9.9. A compensation for past and future benefits should only be taken into account to the extent it can be verified in a deliberate, reliable and objective manner.

2.9.10. Expenses which the IORP incurs in relation to the management and administration of (re)insurance and SPV contracts should be allowed for in the best estimate, calculated gross, without deduction of the amounts recoverable from (re)insurance contracts and SPVs. But no allowance for expenses related to internal processes should be made in the recoverables.

Counterparty default adjustment

Definition of the adjustment

2.9.11. The value of recoverables from (re)insurance contracts and SPVs should be adjusted to take account of expected losses due to default of the counterparty. That adjustment should be calculated separately by counterparty and should be based on an assessment of the probability of default (including as a result of insolvency or dispute) of the counterparty and the average loss resulting there from (loss-given-default). For this purpose, the change in cash flows should not take into account the effect of any risk mitigating technique that mitigates the credit risk of the counterparty, other than risk mitigating techniques based on collateral holdings. The risk mitigating techniques that are not taken into account should be separately recognised without increasing the amount recoverable from (re)insurance contracts and SPVs.

2.9.12. The adjustment should be calculated as the expected present value of the change in cash flows underlying the amounts recoverable from that counterparty, resulting from a default of the counterparty at a certain point in time

2.9.13. This calculation should take into account possible default events over the lifetime of the rights arising from the corresponding (re)insurance contract or SPV and the dependence on time of the probability of default.

2.9.14. For example, let the recoverables towards a counterparty correspond to deterministic payments of C1, C2, C3 in one, two and three years respectively. Let PDt be the probability that the counterparty defaults during year t. Furthermore, we assume that the counterparty will only be able to make 40% of the further payments in case of default (i.e. its recovery rate is 40%). For the sake of simplicity, this example does not consider the time value of money (However, considering it would not change the fundamental conclusions of the example). Then the losses-given-default are as follows:

Default during year	Loss-given-default
1	-60%·(C1 + C2 + C3)
2	-60%·(C2 + C3)
3	-60%·C3

For instance, in year two the value of the recoverables is equal to C2 + C3. If the counterparty defaults in year two the value of the recoverables changes from C2 + C3 to 40%·(C2 + C3). As 60% of the recoveries are lost, the loss-given-default is -60%·(C2+ C3).

2.9.15. The adjustment for counterparty default in this example is the following sum:

$$AdjCD = PD1\cdot(-60\%\cdot(C1 + C2 + C3))$$
$$+ PD2\cdot(-60\%\cdot(C2 + C3))$$
$$+ PD3\cdot(-60\%\cdot C3).$$

Probability of default (PD)

2.9.16. The determination of the adjustment for counterparty default should take into account possible default events during the whole run-off period of the recoverables.

2.9.17. In particular, if the run-off period of the recoverables is longer than one year, then it is not sufficient to multiply the expected loss in case of immediate default of the counterparty with the probability of default over the following year in order to determine the adjustment. In the above example, this approach would lead to an adjustment of

PD1·(-60%·(C1 + C2 + C3)).

2.9.18. Such an approach is not appropriate because it ignores the risk that the counterparty may – after surviving the first year – default at a later stage during the run-off of the recoverables.

2.9.19. The assessment of the probability of default and the loss-given-default of the counterparty should be based upon current, reliable and credible information. Among the possible sources of information are: credit spreads, credit quality steps, information relating to the supervisory solvency assessment, and the financial reporting of the counterparty. The applied methods should lead to market consistent results. The IORP should not rely on information of a third party without assessing that the information is current, reliable and credible.

2.9.20. Criteria to assess the reliability of the information might be neutrality, prudence and completeness in all material aspects.

2.9.21. The IORP may consider for this purpose methods generally accepted and applied in financial markets (f.i., based on CDS markets), provided the financial information used in the calculations is sufficiently reliable and relevant for the purposes of the adjustment of the recoverables from (re)insurance.

2.9.22. In the case of recoverables from an SPV, the probability of default of an SPV should be calculated according to the average credit quality step of assets held by the SPV, unless there is a reliable basis for an alternative calculation. When the IORP has no reliable source to estimate its probability of default, (f.i. there is a lack of credit quality step) the following rules should apply:

- SPV authorised under EU regulations: the probability of default should be calculated according to the average rating of assets and derivatives held by the SPV in guarantee of the recoverable.
- Other SPV where they are recognised as equivalent to those authorized under EU regulations: same treatment as in the case referred above.
- Others SPV: They should be considered as unrated.

2.9.23. Where possible in a reliable, objective and prudent manner, point-in-time estimates of the probability of default should be used for the calculation of the adjustment. In this case, the assessment should take the possible time-dependence of the probability of default into account. If point-in-time estimates are not possible to calculate in a reliable, objective and prudent manner or their application would not be proportionate, through-the-cycle estimates of the probability of default might be used.

2.9.24. A usual assumption about probabilities of default is that they are not constant over time. In this regard it is possible to distinguish between point-in-time estimates which try to determine the current default probability and through-the-cycle estimates which try to determine a long-time average of the default probability.

2.9.25. In many cases only through-the-cycle estimates may be available. For example, the credit quality steps of rating agencies are usually based on through-the-cycle assessments. Moreover, the sophisticated analysis of the

time dependence of the probability of default may be disproportionate in most cases. Hence, through-the-cycle estimates might be used if point-in-time estimates cannot be derived in a reliable, objective and prudent manner or their application would not be in line with the proportionality principle. If through-the-cycle estimates are applied, it can usually be assumed that the probability of default does not change during the run-off of the recoverables.

2.9.26. The assessment of the probability of default should take into account the fact that the cumulative probability increases with the time horizon of the assessment.

2.9.27. For example, the probability that the counterparty defaults during the next two years is higher than the probability of default during the next year.

2.9.28. Often, only the probability of default estimate PD during the following year is known. For example, if this probability is expected to be constant over time, then the probability PDt that the counterparty defaults during year t can be calculated as

$PDt = PD \cdot (1 - PD)^{t-1}$.

2.9.29. This does not preclude the use of simplifications where their effect is not material (see below).

Recovery rate (RR)

2.9.30. The recovery rate is the share of the debts that the counterparty will still be able to honour in case of default.

2.9.31. If no reliable estimate of the recovery rate of a counterparty is available, no rate higher than 50% should be used.

2.9.32. The degree of judgement that can be used in the estimation of the recovery rate should be restricted, especially where owing to a low number of defaults, little empirical data about this figure in relation to reinsurers is available, and hence, estimations of recovery rates are unlikely to be reliable.

2.9.33. The average loss resulting from a default of a counterparty should include an estimation of the credit risk of any risk-mitigating instruments that the counterparty provided to the IORP ceding risks to the counterparty.

2.9.34. However, IORPs should consider the adjustment for the expected default losses of these mitigating instruments, i.e. the credit risk of the instruments as well as any other risk connected to them should also be allowed for. This allowance may be omitted where the impact is not material. To assess this materiality it is necessary to take into account the relevant features, such as the period of effect of the risk mitigating instrument.

Simplification for the counterparty default adjustment

2.9.35. IORPs may calculate the adjustment for expected losses due to default of the counterparty for a specific counterparty and homogeneous risk group to be equal as follows:

$$Adj_{CD} = -\max\left(0.5 \cdot \frac{PD}{1-PD} \cdot Dur_{mod} \cdot BE_{rec}; 0\right)$$

where:

(a) PD denotes the probability of default of that counterparty during the following 12 months;

(b) Durmod denotes the modified duration of the amounts recoverable from (re)insurance contracts with that counterparty in relation to that homogeneous risk group;

(c) BErec denotes the amounts recoverable from (re)insurance contracts with that counterparty in relation to that homogeneous risk group.

2.9.36. If the adjustment for recoverables is calculated using an alternative method, the IORP should be able to provide a clear description of this alternative method.

2.10. Risk-free interest rates

2.10.1. IORPs are requested to value the common balance sheet using a risk free discount rate curve. As in the IORP stress tests before and as suggested in EIOPA's opinion on a common framework for risk assessment and transparency for IORPs, the risk free discount rate curve in the IORP 2019 stress test does not include adjustments like the matching or volatility adjustment.

2.10.2. EIOPA will provide IORPs with a spreadsheet containing the basic risk-free interest rate term structures for the currencies in participating member states per 31 December 2018.

2.10.3. The risk-free interest rate term structure data correspond to the technical information that EIOPA publishes on a monthly basis in accordance with Article 77e of the Solvency II Directive. Technical documentation is available on EIOPA's website[14], which allows IORPs to apply the Smith-Wilson procedure themselves for the purpose of generating stochastic scenarios of the basic risk-free interest rate.

Basic risk-free interest rate

2.10.4. The table below summarises the approach used for deriving the basic risk-free term structures for the relevant countries:

Country	Currency	Instrument	Credit risk adjustment (bps)	LLP	Convergence period	UFR
Euro area	EUR	Swap	10	20	40	4.05%
Denmark	EUR	Swap	11	20	40	4.05%
Liechtenstein	CHF	Swap	10	25	40	3.05%
Norway	NOK	Swap	10	10	50	4.05%
Sweden	SEK	Swap	10	10	10	4.05%
UK	GBP	Swap	10	50	40	4.05%

Reference instruments

2.10.5. The basic risk-free interest rates have been derived on the basis of interest rate swap rates for the relevant currencies, adjusted to take account of credit

[14] EIOPA, Technical documentation of the methodology to derive EIOPA's risk-free interest rate term structures, EIOPA-BoS-15/035, 31 January 2018: https://eiopa.europa.eu/regulation-supervision/insurance/solvency-ii-technical-information/risk-free-interest-rate-term-structures

risk. Swap prices are mid prices. For Denmark the EUR curve has been used because the Danish currency is considered to be pegged to the Euro.

Credit risk adjustment

2.10.6. The credit risk adjustment is applied as a parallel downward shift of the observed market yields for those maturities up to the last liquid point. The credit risk adjustment is applied to the observed swap rates before deriving zero-coupon rates.

2.10.7. The adjustment takes into account the credit risk that is embedded in the determination of the floating rate leg of the swap contract, i.e. the credit risk pertaining to uncollateralised interbank market. Thus, the credit risk adjustment depends on the credit quality of the banks that, via interbank transactions, determine the basis for the floating leg in swap contracts.

2.10.8. The adjustment has been determined on the basis of the difference between rates capturing the credit risk reflected in the floating rate of interest rate swaps and overnight indexed swap rates of the same maturity, where both rates are available from deep, liquid and transparent financial markets. The calculation of the adjustment has been based on 50 percent of the average of that difference over a time period of one year, subject to a cap and a floor to ensure that it is not lower than 10 basis points or higher than 35 basis points.

2.10.9. For Norway the credit risk adjustment for the Swedish currency applies. The adjustment for Denmark includes a 1 basis point adjustment for currency risk for currencies pegged to the Euro.

Last liquid point and extrapolation methodology

2.10.10. The basic risk-free interest rate term structure for each currency is constructed from a finite number of data points, corresponding to swap rates that can be observed in deep, liquid and transparent markets. Both the interpolation between these data points, where necessary, and the extrapolation beyond the last liquid point (LLP) has been done using the Smith-Wilson method.

Ultimate forward rate (UFR)

2.10.11. The ultimate forward rate (UFR) is the percentage rate that the forward curve converges to at the convergence point, i.e. LLP plus convergence period. It is calculated as the sum of the expected real rate and the expected inflation rate. The expected real rate is assumed the same for all currencies and is the simple average of the past real rates since 1961.

2.10.12. The ultimate forward rate (UFR) is determined in accordance with the methodology to derive the UFR[15]. For the euro the calculated UFR for 2018 is 4.05%.

Convergence period

2.10.13. The convergence point is the maximum of (LLP+40) and 60 years or the convergence period is the maximum of 40 years and (60-LLP). The convergence period for the SEK equals 10 years, considering the characteristics of the Swedish bond market.

[15] See "Updated calculation of the UFR for 2018.pdf" (May 2017) and "Calculation of the UFR for 2019.pdf" at https://eiopa.europa.eu/regulation-supervision/insurance/solvency-ii-technical-information/risk-free-interest-rate-term-structures.

2.10.14. The alpha parameter in the Smith-Wilson method, which controls the convergence speed, is set at the lowest value that produces a curve reaching the convergence tolerance of the UFR by the convergence point. The convergence tolerance is set at 1 basis point.

2.11. Inflation and salary increases

2.11.1. For some IORPs, sponsor contributions and benefits may be linked to price inflation and wage growth. This is the case for the best estimate of unconditional benefits (such as in the case of guaranteed indexation), but also in the case of conditional or discretionary benefits (such as in the case of conditional indexation granting based on the solvency position of the IORP). Paragraphs 2.5.8 ff. defines whether future inflation or salary increases should be taken into account in the best estimate of technical provisions. Whenever inflation rates or salary increases are needed, IORPs should use the following:

2.11.2. The inflation rates curve to be used is provided together with these specifications.

2.11.3. Inflation rates used are market zero-coupon break-even inflation swap rates on end December 2018 for the EUR, GBP and SEK.

2.11.4. The zero-coupon break-even inflation swap rates will be interpolated and extrapolated using the Smith-Wilson method. The UFR is set at 2% for all three currencies. The LLP and the convergence period are assumed to be the same as for the basic risk-free interest rate curve. No credit risk adjustment is applied.

2.11.5. The inflation curve for DKK is set equal to the EUR inflation curve, in line with the approach taken to the DKK risk-free interest rate curve. The inflation curves for CHF and NOK are set equal to respectively 1% and 2% for all maturities as no zero-coupon inflation swap rate data are available for these currencies.

2.11.6. IORPs may apply an appropriate adjustment to the inflation rate curve if the inflation measure implied by the provided curve does not adequately reflect the inflation measure to which pension obligations are linked.

2.11.7. No readily available market indices exist for wage inflation. Where an estimate of salary growth is required, IORPs are to increase the price inflation curve with a best estimate of real wage growth that adequately reflects the situation for their company, sector or member state.

2.12. Valuation of other assets and other liabilities

2.12.1. IORPs shall value other assets and other liabilities on a market consistent basis. No subsequent adjustment should be made to take account of the change in the own credit standing of the IORP when valuing financial liabilities.

2.12.2. For the valuation of other assets and other liabilities IORPs should apply the provisions stated in paragraphs 2.12.3 to 2.12.11 to the extent possible and necessary. Based on the concept of materiality IORPs can deviate from these provisions for the valuation of assets and liabilities for items which are, individually or collectively, not material, e.g. by using values based on national accounting standards.

2.12.3. Valuation assumption: IORPs shall value other assets and other liabilities based on the assumption that the IORP will provide occupational retirement benefits as a going concern.

2.12.4. Paragraphs 2.12.5 to 2.12.11 shall apply to the recognition and valuation of assets and liabilities other than technical provisions and security mechanisms.

2.12.5. Valuation methodology – general principles

1. IORPs shall recognise assets and liabilities other than technical provisions and security mechanisms in conformity with the international accounting standards endorsed by the Commission in accordance with Regulation (EC) No 1606/2002.

2. IORPs shall value assets and liabilities other than technical provisions and security mechanisms in conformity with international accounting standards endorsed by the Commission in accordance with Regulation (EC) No 1606/2002 provided that those standards include valuation methods that are consistent with the valuation approach set out in 2.12.1. Where those standards allow for the use of more than one valuation method, only valuation methods that are consistent with 2.12.1 can be used.

3. Where the valuation methods included in international accounting standards endorsed by the Commission in accordance with Regulation (EC) No 1606/2002 are either temporarily or permanently not consistent with the valuation approach set out in 2.12.1, IORPs shall use other valuation methods that have been deemed to be consistent with 2.12.1.

4. By way of derogation from paragraphs 1 and 2, and in particular by respecting the principle of proportionality, IORPs may recognise and value an asset or a liability based on the valuation method they use for preparing its annual or consolidated financial statements provided that:

a. the valuation method is consistent with 2.12.1;

b. the valuation method is proportionate with respect to the nature, scale and complexity of the risks inherent in the business of the IORP;

c. the IORP does not value that asset or liability using international accounting standards endorsed by the Commission in accordance with Regulation (EC) No 1606/2002 in its financial statements;

d. valuing assets and liabilities using international accounting standards would impose costs on the IORP that would be disproportionate with respect to the total administrative expenses.

5. IORPs shall value individual assets separately.

6. IORPs shall value individual liabilities separately.

2.12.6. Valuation methodology – valuation hierarchy

1. IORPs shall, when valuing assets and liabilities in accordance with 2.12.5 1, 2 and 3, follow the valuation hierarchy set out in paragraphs 2 to 7 below, taking into account the characteristics of

the asset or liability where market participants would take those characteristics into account when pricing the asset or liability at the valuation date, including the condition and location of the asset or liability and restrictions, if any, on the sale or use of the asset.

2. As the default valuation method, IORPs shall value assets and liabilities using quoted market prices in active markets for the same assets or liabilities.

3. Where the use of quoted market prices in active markets for the same assets or liabilities is not possible, IORPs shall value assets and liabilities using quoted market prices in active markets for similar assets and liabilities with adjustments to reflect differences. Those adjustments shall reflect factors specific to the asset or liability including all of the following:

a. the condition or location of the asset or liability;

b. the extent to which inputs relate to items that are comparable to the asset or liability; and

c. the volume or level of activity in the markets within which the inputs are observed.

4. The use of quoted market prices shall be based on the criteria for active markets, as defined in international accounting standards endorsed by the Commission in accordance with Regulation (EC) No 1606/2002.

5. Where the criteria referred to in paragraph 4 are not satisfied, IORPs shall, unless otherwise stated, use alternative valuation methods.

6. When using alternative valuation methods, IORPs shall rely as little as possible on IORP-specific inputs and make maximum use of relevant market inputs including the following:

a. quoted prices for identical or similar assets or liabilities in markets that are not active;

b. inputs other than quoted prices that are observable for the asset or liability, including interest rates and yield curves observable at commonly quoted intervals, implied volatilities and credit spreads;

c. market-corroborated inputs, which may not be directly observable, but are based on or supported by observable market data.

All those market inputs shall be adjusted for the factors referred to in paragraph 3.

To the extent that relevant observable inputs are not available including in circumstances where there is little, if any, market activity for the asset or liability at the valuation date, IORPs shall use unobservable inputs reflecting the assumptions that market participants would use when pricing the asset or liability, including assumptions about risk. Where unobservable inputs are used, IORPs shall adjust IORP-specific data if reasonable available information indicates that other market participants would use different data or

there is something particular to the IORP that is not available to other market participants.

When assessing the assumptions about risk referred to in this paragraph, IORPs shall take into account the risk inherent in the specific valuation technique used to measure fair value and the risk inherent in the inputs of that valuation technique.

7. IORPs shall use valuation techniques that are consistent with one or more of the following approaches when using alternative valuation methods:

a. market approach, which uses prices and other relevant information generated by market transactions involving identical or similar assets, liabilities or groups of assets and liabilities. Valuation techniques consistent with the market approach include matrix pricing.

b. income approach, which converts future amounts, such as cash flows or income or expenses, to a single current amount. The fair value shall reflect current market expectations about those future amounts. Valuation techniques consistent with the income approach include present value techniques, option pricing models and the multi-period excess earnings method;

c. cost approach or current replacement cost approach reflects the amount that would be required currently to replace the service capacity of an asset. From the perspective of a market participant seller, the price that would be received for the asset is based on the cost to a market participant buyer to acquire or construct a substitute asset of comparable quality adjusted for obsolescence.

2.12.7. Recognition of contingent liabilities

1. IORPs shall recognise contingent liabilities in accordance with the general principles outlined in 2.12.5 if they are material.

2. Contingent liabilities are material if information about the current or potential size or nature of those liabilities could influence the decision-making or judgement of the intended user of that information, including NSAs.

2.12.8. Valuation methods for goodwill and intangible assets: IORPs shall value the following assets at zero:

1. goodwill;

2. intangible assets, other than goodwill, unless the intangible asset can be sold separately and the IORP can demonstrate that there is a value for the same or similar assets that has been derived in accordance with paragraph 2.12.6 2, in which case the asset shall be valued in accordance with paragraph 2.12.6.

2.12.9. Valuation methods for specific liabilities: IORPs shall value:

1. Financial liabilities, as referred to in international accounting standards endorsed by the Commission in accordance with Regulation (EC) No 1606/2002, in accordance with 2.12.5 upon initial recognition. There shall be no subsequent adjustment to take

account of the change in own credit standing of the IORP after initial recognition.

2. Contingent liabilities, recognised in accordance with paragraph 2.12.7. The value of contingent liabilities shall be equal to the expected present value of future cash flows required to settle the contingent liability over the lifetime of that contingent liability, using the basic risk-free interest rate term structure.

2.12.10. Deferred taxes

1. IORPs shall recognise and value deferred taxes in relation to all assets and liabilities including technical provisions that are recognised for solvency or tax purposes in conformity with 2.12.5.

2. Notwithstanding paragraph 1, IORPs shall value deferred taxes, other than deferred tax assets arising from the carryforward of unused tax credits and the carryforward of unused tax losses, on the basis of the difference between the values ascribed to assets and liabilities including technical provisions, recognised and valued in accordance with 2.12.1 and the values ascribed to assets and liabilities as recognised and valued for tax purposes.

3. IORPs shall only ascribe a positive value to deferred tax assets where it is probable that future taxable profit will be available against which the deferred tax asset can be utilised, taking into account any legal or regulatory requirements on the time limits relating to the carryforward of unused tax losses or the carryforward of unused tax credits.

2.12.11. Exclusion of valuation methods

1. IORPs shall not value financial assets or financial liabilities at cost or amortized cost.

2. IORPs shall not apply valuation models that value at the lower of the carrying amount and fair value less costs to sell.

3. IORPs shall not value property, investment property, plant and equipment with cost models where the asset value is determined as cost less depreciation and impairment.

4. IORPs which are lessees in a financial lease or lessors shall comply with all of the following when valuing assets and liabilities in a lease arrangement:

a. lease assets shall be valued at fair value;

b. for the purposes of determining the present value of the minimum lease payments market consistent inputs shall be used and no subsequent adjustments to take account of the own credit standing of the IORP shall be made;

c. valuation at depreciated cost shall not be applied.

5. IORPs shall adjust the net realisable value for inventories by the estimated cost of completion and the estimated costs necessary to make the sale where those costs are material. Those costs shall be considered to be material where their non-inclusion could influence the decision-making or the judgement of the users of the balance sheet, including the NSAs. Valuation at cost shall not be applied.

6. IORPs shall not value non-monetary grants at a nominal amount.

7. When valuing biological assets, IORPs shall adjust the value by adding the estimated costs to sell if the estimated costs to sell are material.

3. Annexes

Annex 1: Credit quality steps and ratings

Different external credit assessment institutions (rating agencies) present their ratings using different rating scales. IORPs may use ratings produced by different rating agencies. Therefore it is necessary to describe how these ratings should be mapped to the "credit quality steps" referred to in these technical specifications. The following table presents such a mapping. This table is only for application in this exercise.

Rating		Credit Quality Step associated
Standard & Poor's Fitch	Moody's	
AAA	Aaa	0
AA	Aa	1
A	A	2
BBB	Baa	3
BB	Ba	4
lower than BB, unrated	Lower than Ba, unrated	5-6, -

Annex 2: Possible simplifications

Best estimate of technical provisions

Biometric risk factors

Biometric risk factors are underwriting risks covering any of the risks related to human life conditions, e.g.:

- mortality/longevity rate,
- morbidity rate,
- disability rate.

The list of possible simplifications for obtaining biometric risk factors, which does not include all simplifications allowed and which could be used in combination, includes:

- assume that biometric risk factors are independent from any other variable (i.e. mortality is independent of future changes of morbidity status of policyholder);
- use cohort or period data to analyse biometric risk factors;
- apply current tables in use adjusted by a suitable multiplier function. The construction of reliable mortality, morbidity/ disability tables and the modelling of trends could be based on current (industry standard or other) tables in use, adjusted by a suitable multiplier function. Industry-wide and other public data and forecasts should provide useful benchmarks for suitable multiplier functions.

Financial options and guarantees

The possible simplification for financial options and guarantees is to approximate them by assuming a Black-Scholes type of environment, although its scope should be carefully limited to those cases where the underlying assumptions of such model are tested. Additionally, even stochastic modelling may require some simplifications when facing extremely complex features.

Investment guarantees

The non-exhaustive list of possible simplifications for calculating the values of investment guarantees includes:

- assume non-path dependency in relation to management actions, regular contributions, cost deductions (e.g., management charges,...);
- use representative deterministic assumptions of the possible outcomes for determining the intrinsic values of extra benefits;
- assume deterministic scenarios for future contributions (when applicable), mortality rates, expenses,...;
- apply formulaic simplified approach for the time values if they are not considered to be material.

Other options and guarantees

The possible simplifications for other options and guarantees are:

- ignore options and guarantees which are not material;
- group, for instance, guaranteed expense charge and/or guaranteed mortality charge with investment guarantee and approximate them as one single investment guarantee;
- use the process outlined in the previous paragraph in the absence of other valuation approaches, if appropriate.

Distribution of future conditional and discretionary benefits

Possible simplifications for determining the future conditional and discretionary benefits may include, where appropriate, the assumption that economic conditions will follow a certain pattern, not necessarily stochastic, appropriately assessed.

Expenses

The possible simplification for expenses is to use an assumption built on simple models, using information from current and past expense loadings, to project future expense loadings, including inflation.

Cash flows and term structure

As a simplification to applying the risk free curve to each maturity, an average maturity can be calculated and the relevant risk free point used.

Other issues

Having in mind the wide range of assumptions and features taken into account to calculate best estimates, there are other areas not mentioned previously where it might be possible to find methods meeting the requirements set out in these specifications to apply simplifications.

As an example, other possible simplification is to assume that:

- cash flows to/from the beneficiaries occur either at the end of the year or in the middle of the year.

Another possible simplification for the payments of contributions which also include lapses and contribution waivers (e.g. contribution waivers in case of disability of the member) is to assume that future contributions are paid independently of the financial markets and IORPs' specific information.

As a further example, possible simplifications in relation to fund/account value projections (which is important for valuing financial options and guarantees) are to:

- group assets with similar features/use representative assets or indexes;
- assume independency between assets, for instance, between equity rate of return and interest rate.

Security and benefit adjustment mechanisms

For the calculation of the probability-weighted average cash flows from the sponsor or pension protection schemes, a deterministic approach could be chosen that only takes into account uncertainty resulting from the default risk of the sponsor.

The values of security and benefit reduction mechanisms do not have to be calculated if IORPs have sufficient financial assets to cover liabilities on the common balance sheet.

Recoverables from (re)insurance contracts

For the calculation of the probability-weighted average cash flows of the recoverables or net payments to the beneficiaries the same simplifications as for the calculation of best estimate could be applied.

The result from the calculation should be adjusted to take account of the expected losses due to the default of the counterparty.