Draft Technical Specifications

QIS of EIOPA's Advice on the Review of the IORP Directive:

Consultation Paper

EIOPA welcomes comments from interested parties on the following consultation paper.

Please send your comments to EIOPA by email (CP-12-003@eiopa.europa.eu) by 31.07.2012, indicating the reference "EIOPA-CP-12-003".

*Please note that comments submitted after the deadline or not submitted in the provided template format in MS Word **cannot** be processed.*

EIOPA will make all comments available on its website, except where respondents specifically request that their comments remain confidential.

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1.   Introduction

This consultation paper puts forward for public consultation the draft technical specifications for the quantitative impact study (QIS) of EIOPA's advice to the European Commission on the review of the IORP Directive.

It is the first step towards the development of the quantitative impact study. However, readers should be aware that not all of the content of the consultation paper will be relevant for the situation of their IORPs as this paper covers all the specificities within each member state provisions (please see I.4.4. for further explanation).

1.1. Commission's Call for Advice

I.1.1.   In April 2011 the European Commission asked EIOPA to provide advice on the review of the IORP Directive.[1] The Commission stated in the CfA that it intends to introduce a risk-based prudential regime for IORPs that attains "a level of harmonisation where EU legislation does not need additional requirements at a national level."

I.1.2.   The Commission's objectives are to encourage cross-border activity of IORPs, allow IORPs to benefit from risk-based supervision while ensuring regulatory consistency between and within sectors and to modernise the prudential regulation for IORPs that operate DC schemes.

I.1.3.   The CfA covers a broad range of areas on scope and definitions, valuation and capital requirements, role of the supervisors, governance and information to members and beneficiaries.

I.1.4.   The CfA states that the Commission's proposal to review the IORP Directive will be accompanied by an impact assessment which will take into account the fact that supplementary occupational pension schemes are generally proposed by employers to their employees on a voluntary basis and that any new supervisory system for IORPs should not undermine the supply or the cost-efficiency of occupational retirement provision in the EU.

I.1.5.   As such EIOPA was also requested to prepare a quantitative impact study of its advice with a view to informing this impact assessment. The aim of the QIS is twofold:

- First, to provide all stakeholders with detailed information on the quantitative impact of EIOPA's advice on the prudential balance sheets of IORPs.

- Second, to collect quantitative and qualitative data to support the analysis of different policy options in the impact assessment of the Commission.

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[1] European Commission, Call for Advice from the European Insurance and Occupational Pensions Authority (EIOPA) for the Review of Directive 2003/41/EC (IORP II), 30 March 2011.

1.2. EIOPA's response to Call for Advice

I.2.1. On 15 February 2012, EIOPA published its final response to the Call for Advice.[2] The publication of the final advice followed two public consultations between 8 July 2011 – 15 August 2011 and 25 October 2011 – 2 January 2012.

I.2.2. The advice on the valuation of assets, liabilities and technical provisions (CfA 5) and security mechanisms (CfA 6) constitutes an important part of the response. It recommends that assets and liabilities are valued on a market-consistent basis. Moreover, it puts forward the holistic balance sheet as a possible means to achieve the Commission's objective of a harmonised prudential regime for IORPs with a uniform confidence level. EIOPA also recognises that it may also be useful for other purposes, such as an internal management or supervisory tool.

I.2.3. EIOPA's advice emphasises that occupational pensions and insurance are not identical and that the differences will sometimes merit different approaches. The holistic balance sheet allows the full range of adjustment and security mechanisms available to IORPs in the different member states to be explicitly recognised.

I.2.4. The advice contains qualitative assessments of the costs and benefits to IORPs, sponsors, members and supervisors. However, due to the limited time that EIOPA had to produce its advice in a large number of complex areas, EIOPA was unable to carry out a QIS in time to inform the advice to the Commission.

I.2.5. However, the advice recognised the importance of performing a quantitative impact study and, in the area of valuation and capital requirements, was made conditional on its outcomes. It was particularly stressed that:

- The adoption of the holistic balance sheet in practice needs to be further investigated with respect to the feasibility of the development of a methodology for the quantification of the security and benefit adjustment mechanisms and the effectiveness in terms of costs and benefits of such a methodology.

- Further information is needed on the feasibility in practice of a common level of security and its effectiveness in terms of costs and benefits in, given the diversity of IORPs in the different member states. EIOPA will consider whether to offer further views on this matter in light of the results of the QIS.

I.2.6. The QIS also provides the opportunity to quantitatively compare the remaining options in EIOPA's advice and to collect data to inform the discussion on tiering of assets and own funds and supervisory responses.

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[2] EIOPA, EIOPA's Advice to the European Commission on the review of the IORP Directive 2003/41/EC, EIOPA-BoS-12/015, 15 February 2012.

1.3. Scope

I.3.1.   The QIS will limit itself to assessing the impact of EIOPA's advice on valuation and security mechanisms on the financial requirements for IORPs providing defined benefit or hybrid schemes. This implies that:

- The study will not assess the impact of the advice on scope and definitions, role of the supervisor, governance and disclosure to plan members.

- IORPs providing only pure defined contribution schemes (i.e. that do not provide any guarantees to the participants) will not be included in the exercise.

- The QIS will not constitute a broad impact assessment of all costs and benefits of the EIOPA advice and/or the Commission's objectives for the revision of the IORP Directive. However, the outcomes will feed into the comprehensive impact assessment of the Commission and EIOPA will consider whether to offer further views regarding these aspects as promised in the advice.

I.3.2.   The QIS is confined to the numerical calculations relating to the holistic balance sheet. It is not the scope or mandate of the QIS to consider the wider implications of this approach to determining funding obligations.

1.4. Technical specifications

I.4.1.   The purpose of the technical specifications is to provide IORPs completing the QIS exercise (and other participants) with guidance and prescriptions to value the holistic balance sheet and calculate the solvency capital requirement (SCR) using a standard formula.

I.4.2.   EIOPA's advice does not contain all the necessary information to do so. It constitutes advice for possible future Level 1 legislation and even in that respect it is not fully complete. For instance, it does not provide:

- The specific probability for the confidence level, which determines the size of the SCR, as it is considered to be a political decision.

- Requirements for supervisory responses under differing conditions.

I.4.3.   The advice does also not consider technical issues that would normally be specified in Level 2 implementing measures. Some examples of technical elements that are not specified in EIOPA's advice, but which are essential for implementing the holistic balance sheet in practice are:

- Methodologies to value technical provisions, sponsor support and pension protection arrangements.

- The determination of the risk-free interest rate to discount future cash flows for the valuation of technical provisions and security mechanisms.

- The risks to be included in the calculation of the SCR and their accompanying stresses and correlations in the standard formula.

I.4.4. The technical specifications are the same for every member state participating in the QIS. However, 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. Those participating in the QIS may adopt simplifications depending on the nature of their pension systems as long as the simplification does not lead to the loss of important information that is needed to address the aims of the QIS (including the quantitative comparison of the remaining options in EIOPA's advice, as referred to in paragraph I.2.5.). Simplifications are provided for, however, further simplifications can be adopted by participants as long as it is appropriate to do so and a description of the simplifications used is set out by the participants.

I.4.5. The draft specifications in this document have been developed by making use of the latest technical specifications for Solvency II. In some areas, these specifications were elaborated upon and modified to account for the differences between IORPs and insurance undertakings. This is especially the case for the adjustment and security mechanisms IORPs dispose of, i.e. conditional and discretionary benefits, 'last resort' reductions of benefits, sponsor support and pension protection schemes. In other areas, it is necessary to test in the QIS whether these specifications are suitable for IORPs.

Treatment adjustment and security mechanisms in technical specifications

I.4.6. IORPs' adjustment mechanisms (conditional benefits, discretionary benefits, last resort reductions) and security mechanisms (sponsor support, pension protection schemes) impact on the valuation of the holistic balance sheet as well as the calculation of the solvency capital requirement (SCR).

I.4.7. The values on the holistic balance sheet reflect the benefits the IORP is expected to pay and the contributions the IORP is expected to receive. So, they constitute an average of payments and contributions in different future scenarios with varying demographic and economic developments.

I.4.8. Very often the value of adjustment and security mechanisms will depend on the IORP's actual funding level. 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 and there is less reliance on future sponsor support.

I.4.9. Adjustment and security mechanisms will lower the SCR by absorbing losses incurred by the IORP in a stress situation. In other words, they act as a substitute for financial capital. In a scenario with adverse demographic and capital market developments the value of future benefits - subject to

adjustments - will decline and the value of sponsor contributions will rise. These changes in value should be taken into account in the calculation of the capital requirement.

I.4.10. Sponsor support does not only act as a risk-mitigating mechanism, but also poses a risk for IORPs. The creditworthiness of the sponsor may deteriorate, which would reduce the expected value of future contributions. Exposure to sponsor default risk increases the SCR. A pension protection scheme acts as a risk-mitigating mechanism by providing cover against sponsor default.

Work in progress

I.4.11. The technical specifications should be considered as work-in-progress, which means that they may be subject to deletions, elaborations and improvements – for example, EIOPA is considering including an inflation risk module. In addition, the techniques and specifications proposed for the QIS should not be read as proposals for possible future level 2 measures. They have been derived due to the need for a QIS to be carried out and represent methodologies designed to give a first impression of the impacts of the proposals in EIOPA's advice, consistent with the objectives of the QIS as set out by the Commission.

Valuation holistic balance sheet

I.4.12. As a first step in the QIS exercise, those participating in the QIS are asked to perform the valuation of the various components of the holistic balance sheet: technical provisions, sponsor support, pension protection schemes, recoverables from insurance and other assets and liabilities.

I.4.13. The technical specifications put forward the general method to value the best estimate of technical provisions by calculating the probability weighted average of future cash flows taking into account the time value of money. It contains 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.

I.4.14. The technical specifications discuss the way future cash flows should be determined for the calculation of the best estimate of technical provisions. It provides guidance and prescription on the different schemes that should be distinguished, whether and how to include future accruals, inclusion of discretionary and conditional benefits, expenses and the treatment of options and guarantees.

I.4.15. Sponsor support and pension protection schemes should also be valued by calculating the probability-weighted average of discounted future cash-flows. The technical specifications give guidance and prescription on establishing future contributions and cash flows from pension protection arrangements based on the form of sponsor support, legal obligations of the sponsor (unlimited, limited and no automatic recourse), legal obligation of the pension protection scheme and the ability of the sponsor to pay. It contains a method to determine the maximum amount of support the sponsor is able to provide. In addition, guidance is given on how to determine the default risk of the sponsor. The section proposes two simplifications to value sponsor support and one to value pension protection schemes.

I.4.16.   A stochastic valuation is very time consuming and potentially costly, especially when the IORP (or other participant completing the QIS) does not already have the necessary data and modelling infrastructure in place. In many instances it will therefore be appropriate to use a simplified approach, such as a stochastic valuation with a limited number of risks or a deterministic valuation.

I.4.17.   The section on proportionality (see Chapter 5) sets out criteria to establish whether a simplified method is appropriate. The demands for this first QIS exercise are lower than the degree of accuracy that may normally be required for financial and supervisory reporting.

Solvency capital requirement

I.4.18.   As a second step in the QIS exercise, IORPs are asked to perform the calculation of the solvency capital requirement. The technical specifications prescribe the risks that should be considered by IORPs and how the capital charges relating to these risks should be established under the standard model.

I.4.19.   The stresses and correlations relating to the risks are based on the most recent estimates for Solvency II, which uses a confidence level of 99.5%. EIOPA will also report on the impact of other possible confidence levels, in particular 97.5% and 95%. The capital requirement under the 99.5% capital requirement will be adjusted using a common method to be developed by EIOPA to reflect the lower confidence levels.

I.4.20.   The following risk modules are distinguished in the standard formula: operational risk, market risk, health risk, counterparty default risk (including default risk of the sponsor), pension liability risk and intangible assets risks. The market and pension liability modules can be subdivided into specific risks relating to the IORP's investment portfolio and pension liabilities. It should again be emphasised that not all risks will be relevant or material for all participating IORPs.

I.4.21.   IORPs will first have to calculate gross capital requirements by adding up the individual capital charges using the correlation matrices. The gross calculation excludes the risk-mitigating effects of technical provisions, sponsor support and pension protection arrangements. Subsequently, the gross capital requirements are to be adjusted for the loss-absorbing capacity of the adjustment and security mechanisms IORPs dispose of.

I.4.22.   Sometimes, it may be appropriate for IORPs to apply a simplified approach when calculating the capital charge for a specific risk. Again, the section on proportionality puts forward conditions for such a simplified method to be appropriate and further simplifications may be used if sufficiently justified by the participant.

1.5. Options

I.5.1.   An important objective of the QIS is to analyse the various options left open in the EIOPA advice. The technical specifications describe 22 options that have an impact on the overall financial requirements for IORPs. In addition,

there are the two options of including a level B of technical provisions using the expected return on assets and including a minimum capital requirement.

I.5.2.   The first eight options are described as the default in the main text, the remaining options are identified as such thereafter. The options in the main text should not be construed as representing EIOPA's preferred scenario, but rather as a building block from which other options can be easily constructed. IORPs completing the QIS (and other participants) will be requested to assess all options in the sections on valuation and SCR.

I.5.3.   EIOPA announced in its advice that it would investigate the feasibility of a common level of security across member states. Some member states allow for ex post reductions of benefits through social and labour law, justifying a lower confidence level. A uniform confidence level requires that such 'last resort' reductions can be explicitly taken into account in the holistic balance sheet.

I.5.4.   While pure conditional benefits will always have to be included in technical provisions, the technical specifications contain options for pure discretionary benefits and mixed benefits, which combine both elements of pure conditional benefits and pure discretionary benefits. In addition, there are options on pension protection schemes and the treatment of sponsor support.

Main text:	Options:
99.5% confidence level	97.5% confidence level 95% confidence level
Basic risk-free interest rate	Long-term and illiquid nature adjustment Extrapolation of risk-free rate using QIS5 parameters
Risk margin cost-of-capital	Risk margin adverse deviation No risk margin
Include pure discretionary and mixed benefits	Exclude pure discretionary benefits Exclude pure discretionary and mixed benefits
Include pension protection schemes as an asset	Include pension protection schemes as impacting on the default risk of the sponsor Exclude pension protection schemes
Include ex post benefit reductions	Exclude ex post benefit reductions
Equity dampener	No dampener Duration-based dampener
Sponsor support as asset	Sponsor support as ancillary own funds
Minimum capital requirement	
Level B best estimate of technical provisions: expected return on assets	

I.5.5.   Another important option relates to the determination of the risk-free interest rate curve. In its advice EIOPA recommends the use of the risk-free interest rate taking into account the nature of liabilities for Level A technical

provisions. EIOPA will provide the estimates of the basic risk-free interest rate curve at the end of 2011 for the euro area, Sweden and the United Kingdom.

I.5.6.   The Commission has requested EIOPA to take into account the adjustments considered for insurers providing long-term guarantees. EIOPA's advice also refers to these adjustments. Under the option for the long-term and illiquid nature adjustment, the so-called counter-cyclical premium is approximated by means of an upward, vertical shift in the yield curve or, alternatively, IORPs are – under conditions - provided with the possibility to apply the so-called matching premium. The Commission has also asked EIOPA to test the option of a risk-free interest rate using the QIS5 extrapolation parameters, instead of the parameters following from the work on long-term guarantees. The Commission, Council and European Parliament are currently discussing the issues regarding long-term guarantees in the context of the Omnibus II Directive. The outcomes of these discussions will be taken into account in the final technical specifications of the QIS.

I.5.7.   The discount rate for the calculation of the Level B best estimate of technical provisions is based on the expected return of assets and the asset allocation of the IORP. The expected return on assets will be approximated by the portfolio weighted average of the yield on the different classes of bonds in the fixed-income portfolio and the yield on AAA government bonds plus a risk premium of 3% for equities/risky assets.

I.5.8.   A seemingly limited number of 22 options yields 2916 combinations of possible outcomes. EIOPA is considering presenting the impact of three baseline scenarios with different confidence levels in its final report to keep it comprehensible and manageable. The effects of the remaining options can be compared against one or more of these baselines.

1.6. Qualitative questionnaire and spreadsheets

I.6.1.   Besides the technical specifications document and the risk-free interest rate curves, the QIS package will also include a qualitative questionnaire and a QIS spreadsheet. These have not been published for consultation as EIOPA is still working on both of them.

I.6.2.   The purpose of the qualitative questionnaire is to obtain an assessment by the IORPs of the clarity of the technical specifications, the quality of inputs and results, the methodology of the QIS, the practicability of the calculations involved and the use of simplifications. In addition, IORPs will be invited to give a first impression of the outcomes of the QIS and the potential policy reaction by the IORPs and other stakeholders if the holistic balance approach was implemented. The potential policy reaction will necessarily be a first impression as crucial elements of a revised IORP Directive – in particular supervisory responses, and, as part of a basis for these, such requirements as recovery periods and the tiering of assets and owns funds – would still have to be decided upon.

I.6.3.   The purpose of the spreadsheet is to collect balance sheet data under the current national supervisory regimes and the output from the calculations with respect to the valuation of the holistic balance sheet, the solvency capital requirement and the minimum capital requirement. But the

spreadsheet will also be able to help with some of the calculations, such as adding up the individual capital charges using the correlation matrices. Moreover, EIOPA aims to include spreadsheets to assist IORPs as far as possible with simplified approaches to the valuation of the holistic balance sheet and the calculation of the SCR.

1.7. QIS exercise

I.7.1. Member states can participate in the QIS on a voluntary basis. At the moment, eight member states have indicated their willingness to participate: Belgium, France, Germany, Ireland, Netherlands, Portugal, Sweden and the United Kingdom.

I.7.2. The QIS can be performed by IORPs and insurance undertakings that apply part of the IORP Directive in accordance with Article 4 of the IORP Directive. The IORPs and 'Article 4' insurance undertakings (hereafter referred to as IORPs as well) in these Member States represent the full spectrum of pension schemes and adjustment / security mechanisms:

- Pension schemes range from DC schemes with a minimum guarantee to final wage / average wage DB schemes.

- Adjustment mechanisms include the linkage of individual accounts to investment returns, discretionary and conditional benefits and reduction of accrued benefits.

- Security mechanisms include regulatory own funds, limited sponsor support, full sponsor support and pension protection schemes.

I.7.3. The technical specifications of the QIS will be the same for all member states, although different countries may employ different simplifications depending on national circumstances. The supervisors will (help to) provide guidance to IORPs on how the technical specifications should be translated to the national situation.

I.7.4. National supervisory authorities have considerable freedom in setting up the process for performing the QIS-exercise. The QIS will be performed by:

- IORPs themselves, usually a selection; or

- Supervisory authorities using real or aggregate data; or

- Actuarial firms on behalf of the supervisory authority; or

- A combination of the above.

I.7.5. EIOPA will ensure a consistent application of the technical specifications and the outcome of the result during the actual QIS-exercise by establishing a coordination group and question & answer procedure. In addition, EIOPA intends to analyse the data of individual IORPs after the QIS exercise to explain possible inconsistencies in the QIS results.

1.8. Outcomes and final report

I.8.1. The final report will assess the quantitative impact of EIOPA's advice under the different baselines and options on IORPs in each participating member

state. The outcomes of the QIS exercise will be presented in aggregated form, which means that regardless of the approach chosen by participating member states figures will be grossed up to a national level.

I.8.2. EIOPA intends to measure the quantitative impact of its advice on IORPs by comparing the capital surplus under the holistic balance sheet approach with the surplus under the existing national regimes. Here, the surplus is defined as the actual funding level minus the required funding level and can be positive or negative.

I.8.3. The surplus will not only be specified in relation to the long-term funding requirements – such as the solvency capital requirement – but also with regard to possible intermediate supervisory trigger points, such as the optional minimum capital requirement in the holistic balance sheet approach.

I.8.4. The overall impact will subsequently be unpacked to show the impact of EIOPA's advice on the value of financial assets, non-financial assets like sponsor support and pension protection arrangements, the value of technical provisions and the solvency capital requirement.

I.8.5. The final report will also contain a qualitative assessment – based on the responses to the qualitative questions - with regard to the quality of results, the practicability of calculations and the use of simplifications.

I.8.6. EIOPA intends to include specific sections to start the discussion on the feasibility of adopting the holistic balance sheet in practice, the feasibility of a harmonised confidence level, recovery periods and the tiering of assets and own funds, in order to properly inform the policy making process in these areas after the QIS and without drawing any definite conclusions.

1.9. First QIS for IORPs

I.9.1. EIOPA recognises that insurance undertakings have been through a long process before embarking on the QIS5 exercise. The Solvency II Directive for insurance undertakings has been in development at the various levels for over 10 years. Within this time EIOPA (and its predecessor CEIOPS) has run five QIS exercises relating to the provisions and requirements under Solvency II including a preparatory field study prior to any QIS.

I.9.2. The results of the first QIS were published in March 2006 and focussed only on the calculation of technical provisions and understanding the level of prudence embedded within this and the practicalities of the calculations involved for insurance undertakings. The results of QIS5 were published in March 2011 and represented a comprehensive study including the full range of requirements under Solvency II.

I.9.3. It is important therefore to note that this QIS represents the first impact study for IORPs and covers a very broad range of issues that are in many respects new concepts for IORPs, pension supervisors and other stakeholders alike. Therefore, an important objective of this QIS will also be for these stakeholders to explore the practical application of such a new type of supervisory regime.

1.10. Consultation and deadline

I.10.1.   EIOPA will adhere in its consultation to the principles established in EIOPA's Public Statement of Consultation Practices.[3] Article 3.3 of the Public Statement says EIOPA will aim at allowing a three month consultation period. However, imposition of an external timetable is given as one reason to shorten the consultation period, which is the case on this occasion.

I.10.2.   EIOPA is consulting stakeholders in the process of developing technical specifications for the QIS. It allows for comments and suggestions from stakeholders to be properly taken into account. In the end, the success of the QIS crucially depends on the quality of technical specifications and the support of the occupational pensions sector.

I.10.3.   Stakeholders are invited to respond to the specific questions listed in Annex 5 of this document or to any other aspect of this consultation paper. EIOPA is particularly interested to know whether the proposed specifications to value the holistic balance sheet and to calculate the solvency capital requirement are feasible at appropriate costs within the expected timeframe. Comments are most useful if they contain a clear rational and describe any alternatives EIOPA should consider.

I.10.4.   The deadline for responses is **31 July 2012**. Please note that responses need to be submitted in MS Word on the template provided for EIOPA to be able to process them.

1.11. Next steps

I.11.1.   Following the public consultation EIOPA will send a revised version to the European Commission for its consideration. The actual QIS exercise is expected to start at the beginning of October and to last until mid-December.

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[3] EIOPA-BOS-11-016

2. Valuation holistic balance sheet

2.1. Valuation date

HBS.1.1   The reporting date to be used by all participants should be end December 2011. 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. For this, the IORP should contact its Home State supervisor.

2.2. Segmentation

HBS.2.1   Pension obligations should be segmented as a minimum by segment in order to calculate technical provisions.

HBS.2.2   The purpose of segmentation of pension obligations is to achieve an accurate valuation of technical provisions. For example, in order to ensure that appropriate assumptions are used, it is important that the assumptions are based on homogenous data to avoid introducing distortions which might arise from combining dissimilar schemes / contracts. Therefore, business is usually managed in more granular homogeneous risk groups than the proposed minimum segmentation where it allows for a more accurate valuation of technical provisions.

HBS.2.3   IORPs in different Member States and even IORPs in the same Member State offer pension schemes covering different sets of risks. Therefore it is appropriate for each IORP to define the homogenous risk group and the level of granularity most appropriate for their IORP and in the manner needed to derive appropriate assumptions for the calculation of the best estimate.

HBS.2.4   Pension obligations should be allocated in a way that best reflects the nature of the underlying risks. In particular, the principle of substance over form should be followed for the allocation. In other words, the segmentation should reflect the nature of the risks underlying the scheme / contract (substance), rather than the legal form of the scheme / contract (form).

HBS.2.5   The segmentation should be applied to both components of the technical provisions (best estimate and risk margin).

Segmentation of pension schemes

HBS.2.6   Pension schemes should be segmented into 4 segments.

- Defined benefit
- Pure Defined contribution
- Hybrid
- Health benefit

HBS.2.7   The segment 'Health benefit' covers disability risk, morbidity risk and medical expenses, that are supplementary to the retirement benefits and includes those parts of benefits where an IORP covers against disability/morbidity risk, and where it is not appropriate to include these benefits in one of the other segments (see section 3.8)."

HBS.2.8   The segment "hybrid" should include all activities

-    Which are not classified as "defined benefits"
-    Where there is covered any kind of biometric and / or market risk at any point in time.

2.3.   Best estimate: principles and assumptions

Principles

HBS.3.1   The best estimate of technical provisions should be valued on a market consistent basis. No adjustment to take account of the own credit standing of the IORP should be made.

HBS.3.2   The best estimate should correspond to the probability weighted average of future cash-flows taking account of the time value of money.

HBS.3.3   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.

HBS.3.4   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 in closed form solutions.

HBS.3.5   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 behaviour.

HBS.3.6   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.

HBS.3.7   The best estimate should be calculated gross, without deduction of the amounts recoverable from (re)insurance contracts and special purpose vehicles. Recoverables from (re)insurance should be calculated separately.

Assumptions consistent with information provided by financial markets

HBS.3.8   Assumptions consistent with information about or provided by financial markets include (non-exhaustive list):

- relevant risk-free interest rate term structure,

- currency exchange rates,

- market inflation rates (consumer price index or sector inflation) and

- economic scenario files (ESF).

HBS.3.9   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 subsection 2.9;

HBS.3.10   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;

HBS.3.11   The following principles should be taken into account in determining the appropriate calibration of a market consistent asset model:

a) 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.

b) The asset model should be calibrated to the current risk-free term structure used to discount the cash flows.

c) The asset model should be calibrated to a properly calibrated volatility measure.

HBS.3.12   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.

HBS.3.13 A financial market is deep, liquid and transparent, if it meets the requirements:

   a) a large number of assets can be transacted without significantly affecting the price of the financial instruments used in the replications (deep),

   b) assets can be easily bought and sold without causing a significant movement in the price (liquid),

   c) current trade and price information are normally readily available to the public, in particular to the undertakings (transparent).

HBS.3.14 The calibration of the above mentioned assets models may also be based on adequate actuarial and statistical analysis of economic variables provided they produce market consistent results. For example:

   a) To inform the appropriate correlations between different asset returns.

   b) To determine probabilities of transitions between rating classes and default of corporate bonds.

   c) 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

HBS.3.15 Generally available data refers to a combination of:

   • Internal data

   • External data sources such as industry or market data.

HBS.3.16 Internal data refers to all data which is available from internal sources. Internal data may be either:

   • IORP-specific data:

   • Portfolio-specific data:

HBS.3.17 All relevant available data whether external or internal data, should be taken into account in order to arrive at the assumption which best reflects the characteristics of the underlying portfolio. In the case of using external data, only that which the IORP can reasonably be expected to have access to should be considered.

   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.

HBS.3.18 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 sole use of data which are available from an internal source are not more suitable than external data; and

   b) the origin of the data and assumptions or methodologies used to process them is known to the IORP and the IORP is able to demonstrate that these assumptions and methodologies appropriately reflect the characteristics of the portfolio.

Members/beneficiaries or sponsor behaviour

HBS.3.19 IORPs are required to identify members/beneficiaries or sponsor behaviour where it impacts on the calculation of best estimate.

HBS.3.20 Any assumptions made by IORPs with respect to the likelihood that members/beneficiaries or sponsor 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.

HBS.3.21 Assumptions about the likelihood that members/beneficiaries or sponsor will exercise contractual options should be based on analysis of past members/beneficiaries or sponsor behaviour.

IORP management actions

HBS.3.22 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.

HBS.3.23 The assumptions on future management actions used in the calculation of the technical provisions should be determined in an objective manner.

HBS.3.24 Assumed future management actions should be realistic and consistent with the IORPs current business practice and business strategy unless there is sufficient current evidence that the IORP will change its practices.

HBS.3.25 Assumed future management actions should be consistent with each other.

HBS.3.26 IORPs should not assume that future management actions would be taken that would be contrary to their obligations towards members/beneficiaries or sponsor 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.

HBS.3.27 Assumptions about future management actions should take account of the time needed to implement the actions and any expenses caused by them.

HBS.3.28 IORPs should be able to verify that assumptions about future management actions are realistic through a comparison of assumed future management actions with actions actually taken previously by the IORP.

Expert judgement

HBS.3.29 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,

- 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 to the calculations the environment under which the IORPs have to run its business.

2.4. Best estimate: methodology for calculation

Cash-flow projections

HBS.4.1 Cash-flow projections should reflect expected realistic future demographic, legal, medical, technological, social or economic developments.

HBS.4.2 Mortality tables may differ between IORPs as mortality rates are different between member states as well as between different IORPs, given the individual structure of the population of members and beneficiaries. However, the cash-flow projections should be based on the most recent mortality tables which include a future trend in the mortality rates.

HBS.4.3 As a starting point, the cash-flow projection should be based on a contract-by contract approach, but reasonable actuarial methods and approximations may be used.

HBS.4.4 In particular, to reduce undue burden on the IORP the projection of future cash-flows based on suitable model points can be permitted if the following conditions are met:

a) The grouping of entitlements and their representation by model points is acceptable provided that it can be demonstrated by the IORP that the grouping does not misrepresent the underlying risk and does not significantly misstate the costs.

b) The grouping of entitlements should not distort the valuation of technical provisions.

c) Sufficient validation should be performed by the IORP to be reasonably sure that the grouping of pension contracts has not resulted in the loss of any financially significant attributes of the schemes being valued.

HBS.4.5   In certain specific circumstances, the best estimate element of technical provisions may be negative (e.g. for some individual contracts under some types of IORP). This is acceptable and IORPs should not set to zero the value of the best estimate with respect to those individual contracts.

Time horizon

HBS.4.6   The projection horizon used in the calculation of best estimate should cover the full lifetime of all the cash in- and out-flows 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.

HBS.4.7   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.

Recognition and derecognition of pension schemes

HBS.4.8   The calculation of the best estimate should only include future cash-flows associated with existing pension schemes / contracts.

HBS.4.9   Existing pension schemes / contracts refer to members and beneficiaries which are accruing or have accrued benefits in the IORP up to the valuation date.

HBS.4.10   For the purpose of this QIS, the concept of accrued benefits in a DC plan refers to the amount of contributions and earnings that have been accumulated up to a certain date.

HBS.4.11   A scheme / contract should be derecognised as an existing pension scheme / contract only when the obligation specified in the scheme / contract is discharged or cancelled or expires.

Benefits and contributions to be included in cash flows

HBS.4.12   To determine for which benefits and contributions the cash in- and out-flows are taken into account, two types of pension schemes (pension contracts) are distinguished:

1. Schemes/contracts where there is the possibility[4] to end the scheme/contract in the way that with respect to the future service of the current population of members no new benefits are accrued or covered, or where the IORP has the possibility to adjust the future

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[4] In one interpretation IORPs should have the possibility to end the scheme/contract. However, in a number of member states the sponsor or social partners have the possibility to end the scheme/contract. EIOPA is still considering – which may require additional fact-finding - under what conditions the possibility of the sponsor / social partners to stop taking on new risk into the liabilities qualifies to be included in HBS.4.12. (1).

accrual of benefits or the contributions to a level that fully reflects the risks.

2. Schemes/contracts where there is no possibility as mentioned in 1.

HBS.4.13 For schemes/contracts for which type 1 holds, in the calculation of technical provisions the IORP takes into account:

- The accrued benefits including the unconditional and pure conditional benefits related to these accrued benefits, which are granted in the future.

- The pure discretionary and mixed benefits granted in the future related to these accrued benefits are only taken into account in the options that include pure discretionary benefits and/or mixed benefits.

HBS.4.14 For schemes/contracts for which type 2 holds, in the calculation of technical provisions the IORP takes into account:

- The benefits as described for the schemes/contracts for which type 1 holds.

- Together with new benefits which are accrued or covered with respect to the future service of the current population of members and the corresponding contributions, including the unconditional and pure conditional benefits related to these new benefits, which are granted in the future.

- The pure discretionary and mixed benefits granted in the future related to these new benefits are only taken into account in the options that include pure discretionary benefits and/or mixed benefits.

HBS.4.15 The pure conditional, pure discretionary and mixed benefits are defined in the paragraphs HBS 4.23 – HBS 4.33.

Expenses

HBS.4.16 In determining the best estimate, the IORP should take into account all cash flows arising from expenses that will be incurred in servicing all future obligations related to existing pension schemes/ contracts.

HBS.4.17 Expenses should include both overhead expenses and expenses which are directly assignable to pension schemes/ contracts.

HBS.4.18 Overhead expenses include, for example, expenses which are related to general management and service departments and which are insensitive to the number of existing as well as new pension schemes/ contracts . The allocation of overhead expenses to pension schemes/ contracts, homogeneous risk groups or any other segments of the best estimate should be done on an economic basis following realistic and objective principles.

HBS.4.19 To the extent that future contributions from existing pension schemes/ contracts are taken into account in the valuation of the best estimate,

expenses relating to these future contributions should be taken into consideration.

HBS.4.20 IORPs should consider their own analysis of expenses and any relevant market data. Expense assumptions should include an allowance for the expected future cost increase. These should take into account the types of cost involved. The allowance for inflation should be consistent with the economic assumptions made.

HBS.4.21 For the assessment of the future expenses, IORPs should take into account all the expenses that are directly related to the ongoing administration of obligations related to existing pension schemes/ contracts, together with a share of the relevant overhead expenses, that are above the level of future expenses that will be covered by future contributions from the existing pension schemes/ contracts. The share of overheads should be assessed on the basis that the IORPs continue to acquire new pension schemes/ contracts.

HBS.4.22 Any assumptions about any expected cost reduction should be realistic, objective and based on verifiable data and information.

Conditional and discretionary benefits

HBS.4.23 EIOPA's advice for the revision of the IORP Directive defines two types of non-unconditional benefits: conditional benefits and discretionary benefits. The Advice uses the following definitions: (i) conditional benefits are granted based on certain "objective" conditions, and (ii) discretionary benefits are only granted based on a "subjective" decision making process. However, the Advice also notes that the boundary between conditional and discretionary benefits has to be further investigated.

HBS.4.24 The technical specifications for the Quantitative Impact Study require a better specified distinction between conditional and discretionary benefits. When discussing this distinction, EIOPA recognized there are different views as to what constitutes conditional benefits and what constitutes discretionary benefits. There is agreement on the definitions and character of 'pure conditional benefits' and of 'pure discretionary benefits', but not on the character of the 'mixed benefits' that contain both conditional and discretionary elements.

HBS.4.25 'Pure 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 pure conditional benefits have a payoff that can be objectively linked to some observable realisation. The following examples of pure 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 or the IORP;

c) Benefits that are subject to a benefit adjustment mechanism which is 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.

HBS.4.26 'Pure discretionary benefits' are benefits which are only granted based on a "subjective" decision making process. 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. They are typically granted by means of a periodical decision of the IORP based on non-formalised criteria. In addition, there is no recurrent practice or expectation of granting those benefits.

HBS.4.27 'Mixed benefits' are benefits that are based on "objective" conditions as part of a "subjective" decision making process. As such, these benefits combine elements of pure conditional and pure discretionary benefits. Although they often have a specified or perceived policy of adjusting the accrued benefits, they also have 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 that no legal rights can be derived from possible "objective" conditions (for example a specified or perceived policy of adjusting the accrued benefits) to obtain these benefits.

HBS.4.28 EIOPA Members have different views about whether mixed benefits should be characterized as discretionary benefits or as conditional benefits.

HBS.4.29 Some Members, including those from countries that are known to have significant mixed benefits, are of the view that the existence of a realistic discretionary power overrides the conditional elements. In their view, a benefit can only be characterized as a conditional benefit if members and beneficiaries have a legally enforceable expectation about the granting of the benefits along the lines of the (specified or perceived) policy. The fact that in mixed benefits the IORP (at the very end) always has a realistic discretionary power to deviate from the policy, supported by proper communication to members and beneficiaries, makes them discretionary benefits in this view.

HBS.4.30 Some other Members consider that the existence of a specified indexation policy creates the conditions of "objectivity" as referred to in the definition of conditional benefits. Moreover, those Members also consider that the existence of such a policy creates an expectation of future payments (at least from the point of view of the IORP, and possibly also from the point of view of members and beneficiaries), which they see as incompatible with the option "exclusion of discretionary benefits from technical provisions", if such mixed benefits were considered as discretionary. Therefore, these Members characterise these benefits as conditional benefits.

HBS.4.31   Considering that there are different views on the characterization of mixed benefits, EIOPA intends to include this type of benefits separately in the Quantitative Impact Study. Data gathered in the QIS may assist EIOPA in taking a position.

HBS.4.32   The granting of pure discretionary benefits and mixed benefits is a management/trustee action and assumptions about it should be realistic and verifiable. In particular assumptions about the granting of discretionary benefits should take the relevant and material characteristics of the mechanism for their distribution into account.

HBS.4.33   When performing the Quantitative Impact Study, the value of unconditional benefits, pure conditional benefits, pure discretionary benefits and mixed benefits should be calculated separately.

Valuation requirements for non-unconditional benefits, if included on the holistic balance sheet

HBS.4.34   The EIOPA Advice states that, when calculating the best estimate of technical provisions, IORPs should take into account at least unconditional and conditional benefits. For discretionary benefits an option is provided to either include these in the technical provisions, with the exception of surplus funds, or to exclude them from the technical provisions. Considering that EIOPA has not yet decided on the characterization of mixed benefits, EIOPA needs to specify the following three options in the QIS:

1. Include all types of benefits, with the exception of surplus funds, in the technical provisions;

2. Exclude only pure discretionary benefits from the technical provisions;

3. Exclude pure discretionary benefits and mixed benefits from the technical provisions.

Where under an option certain types of benefits are excluded from the holistic balance sheet, IORPs do not have to value these benefits. The sections on valuation of those benefits hereafter are therefore only valid for the option(s) that includes them in the holistic balance sheet.

HBS.4.35   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. The risk drivers may differ, depending on the nature of the conditions under which the benefits are paid.

HBS.4.36   As a first step, the non-unconditional benefits should be valued separately as if unconditional, in order to provide an upper limit.

HBS.4.37   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 series of deterministic projections with attributed probabilities; or

c. 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.

HBS.4.38   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 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).

HBS.4.39   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. These probabilities of occurrence should be weighted towards adverse scenarios to reflect market pricing for risk. The series of deterministic projections should be numerous enough to capture a wide range of possible outcomes (and, in particular, it should include very adverse yet possible scenarios) and take into account the probability of each outcome's likelihood (which may, in practice, need to incorporate judgement). The value will be understated if only relatively benign or limited economic scenarios are considered.

HBS.4.40   If no marked-to-market model can be defined, the benefit should be marked-to-model and as much market consistent as possible. Assumptions, variables and parameters should be explicitly mentioned and explained.

HBS.4.41   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.

HBS.4.42   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, a firm's treatment of customers or publicly available information unless proper evidence to support the assumption can be observed.

HBS.4.43   Some examples of characteristics of mechanisms that the IORP will take into account when distributing benefits with a realistic discretionary power are the following. IORPs should consider whether they are relevant and material for the valuation of the benefits and take them into account accordingly, applying the principle of proportionality.

- What constitutes a homogenous group of members and what are the key drivers for the grouping?
- How is a benefit divided between groups?
- How is a deficit divided between groups?
- How will the mechanism for the benefits be affected by a large change in the solvency ratio? How is management / trustees expected to behave in such a situation?

- What are the key drivers affecting the level of benefits?
- What is an expected level of the benefits?
- How are the benefits made available to members and what are the key drivers affecting for example conditionality, changes in smoothing practice, level of discretionary by the IORP?
- 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?
- When is an IORP's solvency position so weak that granting the benefits is considered by the IORP to jeopardize the interests of the IORP or groups of members?
- What other restrictions are in place for determining the level of benefits?
- What is an IORP's investment strategy?

HBS.4.44 When taking into account pure discretionary benefits with the exception of surplus funds in the calculation of the best estimate, IORPs should understand surplus funds as follows:

- Surplus funds should be deemed to be accumulated profits which have not been made available for distribution to members and beneficiaries
- In so far as authorised under national law, surplus funds should not be considered as pension liabilities.

Loss absorbing capacity of non-unconditional benefits

HBS.4.45 Non-unconditional benefits have a loss absorbing capacity. The loss absorbing capacity of pure conditional benefits directly follows from the "objective" conditions that are applicable. In general the maximum loss absorbing capacity of pure discretionary benefits and of mixed benefits is equal to their value.

Reduction of benefits in case of sponsor default

HBS.4.46 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.

HBS.4.47 IORPs should take into account this option to reduce benefits – when permitted by national law or contractual arrangements – in the valuation of the best estimate of technical provisions. It 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 fund is in place that guarantees a reduced amount of benefits.
b) The sponsor provides unlimited support and there is no pension protection fund 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.

HBS.4.48   The value of this option can be determined by calculating:

a) In case a. the difference between the value of the pension protection scheme guaranteeing the full level of benefits and its actual value.
b) In case b. the difference between the value of sponsor support without default risk and its actual value including default risk.

Ex post benefit reductions

HBS.4.49   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). IORPs should incorporate these ex post benefit reductions in the valuation of the best estimate of technical provisions. 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 supervisor as regards to when reductions are allowed or required, 3) policy behaviour of the management of the IORP, and 4) historical evidence.

Option: exclude ex post benefit reductions

HBS.4.50   Under this option IORPs should value the best estimate of technical provisions without including ex post benefit reductions of the last resort.

Valuation of options and guarantees embedded in pension contracts

HBS.4.51   IORPs should identify all material contractual options and financial guarantees embedded in their schemes and pension rules. They should take account of the value of financial guarantees and any contractual options when they calculate technical provisions.

Definition of contractual options and financial guarantees

HBS.4.52   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 deliberate decision of its holder is necessary.

HBS.4.53   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 deliberate 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

HBS.4.54   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.

HBS.4.55   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.

HBS.4.56   The best estimate of contractual options and financial guarantees should reflect both the intrinsic value and the time value.

HBS.4.57   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 series of deterministic projections with attributed probabilities; and

- 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.

HBS.4.58   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.

HBS.4.59   For the purposes of the deterministic 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. These probabilities of occurrence should be weighted towards adverse scenarios to reflect market pricing for risk. The series of deterministic projections should be numerous enough to capture a wide range of possible out-comes (and, in particular, it should include very adverse yet possible scenarios) and take into account the probability of each outcome's likelihood (which may, in practice, need to incorporate judgement). The costs will be understated if only relatively benign or limited economic scenarios are considered.

HBS.4.60   When the valuation of the best estimate of contractual options and financial guarantees is not being done on a contract-by-contract basis, the

segmentation considered should not distort the valuation of technical provisions.

HBS.4.61 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.

2.5. Risk Margin

HBS.5.1   IORPs should add to the best estimate an explicit risk margin based on the cost-of-capital concept. The risk margin is then part of the technical provisions in order to value technical provisions as equivalent to the amount that IORP would be expected to require in order to take over and meet the pension obligations.

Simplification

HBS.5.2   IORPs may use the following simplification to establish the risk margin. According to this simplification the risk margin (*CoCM*) should be calculated as a percentage of the level A best estimate technical provisions net of (re)insurance (at $t = 0$), that is

$CoCM = a \cdot BE_{Net}(0),$

where

$BE_{Net}(0)$ = the best estimate technical provisions net of (re)insurance as assessed at time $t = 0$ for the IORP's portfolio of pension obligations; and

a= a fixed percentage (8%)

HBS.5.3   If the IORP finds the proposed simplification not appropriate in the context of this QIS or wants to do a more precise calculation, the IORP is allowed to calculate the risk margin according to Solvency II. For this calculation the IORP can contact the supervisor in its member state.

Options: Explicit risk margin for adverse deviation and no risk margin

HBS.5.4   The explicit risk margin includes a risk buffer in technical provisions to cover against adverse deviations from the best estimate. This option would value the risk margin as taking into account a margin for adverse deviation from the best estimate in line with the current IORP Directive.

HBS.5.5   No calculations are required for these options. A simplified method is already used to calculate the risk marking according to the cost-of-capital approach. A similar simplification for the risk margin for adverse deviation would probably lead to more or less a similar output, i.e. a percentage times the best estimate.

2.6. Sponsor support and pension protection schemes

Sponsor support

HBS.6.1 IORPs should recognise the value of sponsor support as an asset on the holistic balance sheet. Four forms of sponsor support can be distinguished:

A – Increases in contributions
B – Subsidiary liability of the sponsor
C – Contingent assets of the sponsor
D – Claims on the sponsor

HBS.6.2 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).

HBS.6.3 A value for this form of sponsor support can be derived from the wealth of the sponsor which is available to give security to the pension promise. The level of future cash flows that could be expected to give security to the pension promise can then be valued given the liability of the sponsor(s) to make any payments, and the current financial position and creditworthiness of the sponsor. 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.

HBS.6.4 Form C relates to contingent assets of the sponsor. These assets are still in the possession of the sponsor at the accounting date, but are locked in a legally binding way for the purpose of flowing to the IORP under a predefined set of circumstances.

HBS.6.5 Contingent assets of the sponsor should be recognised separately on the holistic balance sheet and valued in accordance with the principles laid down in section 2.9 applying to the valuation of financial assets of IORPs. The value of contingent assets should be deducted from the value of sponsor support in order to avoid any double counting.

HBS.6.6 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.

HBS.6.7 In valuing sponsor support it is important to take into account the ability of the sponsor to make payments (financial constraints) which includes the financial position of the sponsor and also its credit risk.

HBS.6.8 The ability of the IORP/supervisors to demand payments (level of obligation) should also be taken into account which is dependent on the status of sponsor support, namely if there are any legal/contractual limits including when it is purely voluntary

Valuation

HBS.6.9   Sponsor support should be valued on a market-consistent basis.

HBS.6.10   The value of the sponsor support should be calculated as the probability weighted average of discounted value of future cash-flows, that would be required to be paid by the sponsor to the IORP in excess of its regular contribution, in order to ensure assets in the IORP meet a required level.

HBS.6.11   For the purposes of this QIS, the required level is assumed to be the full value of the Level A technical provisions, i.e. without a possible adjustment for a reduction in benefits in case of sponsor default (see HBS.4.42-45)

HBS.6.12   These expected values of future cash-flows are dependent on both the maximum value of sponsor support calculated without default risk (which is used to determine an approximation of the level of payment the sponsor is able to make) and the need of the IORP to request payments (i.e. the gap between the total of all other assets of the IORP and the assumed target level of total assets).

HBS.6.13   Only future additional contributions with respect to existing obligations and accrued rights at the calculation date shall be taken into account.

HBS.6.14   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.

HBS.6.15   The probability of default should be assessed according to the sponsor's rating, following the table below which is used for the counter party default risk module of the SCR. This assumes that the probability of default remains constant throughout.

$Rating_i$	Credit Quality Step	PD_i
AAA	0	0.002%
AA	1	0.01%
A	2	0.05%
BBB	3	0.24%
BB	4	1.20%
B	5	4.175%
CCC or lower	6	4.175%

HBS.6.16   Unrated employers should use a probability of default of 4.175%. If the IORP has evidence as to why a different probability should be used for an

unrated sponsor of their IORP, this can be used and the reasons should be specified.

HBS.6.17   The recovery rate of claims on the sponsor in the event of default should not exceed 50%. EIOPA notes that the appropriate rate for sponsors requires future investigation.

HBS.6.18   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 on this situation.

HBS.6.19   When deriving the amounts of future cash-flows, as well as their probability of occurrence, IORPs should take into account all relevant characteristics of the sponsor support arrangement, and in particular where the sponsor support is limited, the limit should be taken into account in the calculation of cash-flows.

HBS.6.20   Where the sponsor support is 'limited conditional sponsor support', the IORP should perform the calculation as if it was not limited in this way but the value should be reported as relating to 'limited conditional sponsor support'.

HBS.6.21   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.

ii.   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).

iii.   Possible restitutions (i.e. negative contributions) by the IORP to the employer(s) and employees in favourable scenarios should be taken into account.

HBS.6.22   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.

HBS.6.23   In order to provide comparable results and allow for a first quantitative analysis, IORPs are provided with two simplifications at the end of this section that may be used for the valuation of sponsor support.

HBS.6.24   EIOPA recognises that that these simplifications represent a standard methodology for valuing sponsor support for the purpose of this QIS exercise and the individual circumstances of employers and IORPs can differ. If the IORP considers that the standard methodology (including the proposed method below to calculate the maximum amount of sponsor support) 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 requirements set out in this section. IORPs are requested to apply the simplifications on a voluntary basis as well, using the provided spreadsheets - that require only a few inputs - and to specify why the proposed methods are not appropriate, allowing EIOPA to enhance the simplifications.

Maximum value of sponsor support

HBS.6.25   IORPs should derive an approximation of the maximum amount of sponsor support that would be available from the sponsor.

HBS.6.26   The value of maximum support is required to assess whether the expected value of sponsor support does not exceed the sponsor's financial capabilities. In addition, this figure is needed in the calculation of the SCR to determine the maximum loss absorbing capacity of sponsor support (see section 3.2) and in the ancillary own funds option (see HBS 6.93-94). These draft technical specifications specify that the value of sponsor support to be included on the holistic balance sheet equals its expected value, but the use of its maximum value is still under discussion.

HBS.6.27   Where sponsor support may be contractually limited to a certain value in some way, the value of maximum sponsor support should not exceed this limit.

HBS.6.28   The maximum amount of sponsor support may be split into two components

a) the wealth currently available for the IORP
b) the wealth which can be foreseen to be made available for the IORP through future profits of the sponsor

HBS.6.29   Component a), the wealth currently available for the IORP, should be taken as the sum of

- A proportion of the excess of assets over liabilities of the sponsors balance sheet and
- 100% of the liabilities of the sponsor towards the IORP, as written in the balance sheet of the sponsor

HBS.6.30   Component b), the future foreseen wealth available for the IORP should equal the sum of:

I.   Current recovery plan contributions discounted for time horizon d; and the minimum between
II. A proportion of the expected future discounted net profit of the sponsor, for time horizon d and
III. A proportion of the expected future discounted EBTDA, with the same time horizon as above

If this minimum value is negative, then the future wealth available should be considered to be 0. Where current recovery plan contributions are already included in either II or III above, then they should be deducted from the value to avoid double counting these values.

HBS.6.31 Where IORPs have sufficient information regarding the future business plans of the sponsor that will affect the estimation of II and III then this should be taken into account. For the purposes of this QIS and simplification, adjustments for such future business plans can be ignored if this information is not readily available or is not deemed significant.

HBS.6.32 The value to be reported and retained for the maximum sponsor support shall be the sum of the components a) and b).

HBS.6.33 The calculation for maximum sponsor support is requested to be done both with and without taking credit risk into account. For the former, the annual probability of default of the sponsor should be assessed according to the sponsor's rating. For the latter, the probability of default can be ignored.

HBS.6.34 Where the legal nature of sponsor support means that the sponsor has the opportunity to choose to no longer provide support – for example by closing the IORP and severing its link to the IORP – then the same calculation should be performed, but the value should be reported as relating to 'limited conditional sponsor support'.

HBS.6.35 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.

Input

HBS.6.36 The following input information is required:

$d =$ The number of future years for which sponsor support is included in the assessment. For the purpose of this QIS, 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

$i^t =$ Discount factor for year t. For the purpose of this QIS, this should reflect the appropriate risk free rate for the duration of d

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

$EC_t =$ Expected cash flow at year t. This figure should be the sum of:
  (i) Discounted current recovery plan contributions extended to year d; plus the minimum between
  (ii) For the purpose of this QIS, 50% of the expected future discounted net profit to year d and
  (iii)   For the purpose of this QIS, 25% of the sponsors' earnings before taxes, depreciation and amortization (EBTDA) from the annual accounts of the sponsors, for year t, to year d. The base year figure for EBTDA can be derived from the average of the most recent 3 years data, with allowance for inflation to the base date.

For all future years, this figure should be increased by inflation to year t

HBS.6.37 If the minimum of (ii) and (iii) is negative, then they should be considered to be 0. Where current recovery plan contributions are already included in either II or III above, then they should be deducted from the value to avoid the double counting of these amounts.

Z = The sum of shareholder funds of the sponsor as reported in the most recent accounts of the sponsor.

ξ = Proportion of shareholder funds available for the IORP. This parameter should be set at 50%.

y = The value of the liabilities already accounted for in the sponsor accounts.

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

Output

HBS.6.38 This delivers the following output:

M_{ss} = Maximum value of sponsor support without credit risk
M_{ss} cr   = Maximum value of sponsor support with credit risk

Calculation

HBS.6.39 The formula to be used for this QIS to derive the maximum value is as follows. In carrying out this calculation a spreadsheet will be developed by EIOPA meaning the only the inputs will be required from IORPs.

Maximum value of sponsor support taking account of credit risk

$$M_{ss}\,\text{cr} = \text{Min} \left(\text{Lim}M_{ss}; \sum_{t=1}^{d} i^{t+0.5} * (1-P_{def})^t * EC_t + (\xi * z + y)\right)$$

Maximum value of sponsor support without taking account of credit risk

$$M_{ss} = \text{Min} \left(\text{Lim}M_{ss}; \sum_{t=1}^{d} i^{t+0.5} * EC_t + (\xi * z + y)\right)$$

Simplification 1 - Stochastic valuation of sponsor support

HBS.6.40 In carrying out this calculation a spreadsheet will be developed by EIOPA meaning that only the inputs will be required from IORPs.

HBS.6.41 This method implements the following calculations (see Annex 1 for a more elaborate description):

- **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:
    o a cap equal to the maximum sponsor support as calculated above
    o 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.

Input

HBS.6.42 This method requires the following input:

- TP: the value of Level A technical provisions, calculated according to sections 2.2-2.5 .

- A : the market value of investment assets, valued according to section 2.9

- σ_A : the relative standard deviation of assets

This factor corresponds to the ratio between the standard deviation of the value of assets and the value itself. The RSD value shall be positive. The relative standard deviation depends on the actual composition of the portfolio of assets:
    o for a pure risk free asset, the RSD is 0
    o for a fixed income bond, it might be between 0 and 25%, depending on the rating of the bond
    o 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 QIS, 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:

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

For the purposes of this QIS, 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)

- 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.
- o For a DB scheme without any possibility of reduction of benefits, this parameter should be 0.
- o For a pure DC scheme, this value should be 100%.
- o 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 QIS, these IORPs can use a default value of 30%.

- M_{ss} : the maximum value of sponsor support, calculated without default risk

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

This duration should correspond to the time (in years) the sponsor will need to pay to the IORP the full amount of required support. It should be the same as the one used in the calculation of the "maximum possible sponsor support". For the purpose of this QIS, 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 by the IORP, in case of default of the sponsor, which should not exceed 50%. For the purpose of this QIS, 50% can be assumed but IORPs may use other figures if appropriate stating the reasons why.

Calculation

HBS.6.43 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 value of the sponsor support to the IORP is given by the following formula. In carrying out this calculation a spreadsheet will be developed 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.

HBS.6.44 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 will be developed by EIOPA meaning the 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 – Deterministic value of sponsor support

HBS.6.45 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. The figures below show the probability trees for a period of three years, but these can be extended to cover longer periods.

HBS.6.46 Returns on all assets are assumed to be equal to the risk-free interest rate. This ensures that the calculated value equals the value of the replicating portfolio.

HBS.6.47 Sponsor contribution and receipts are assumed to be symmetric, i.e. the sponsor contributes to recover shortfalls, but also receives any surpluses.

Input

HBS.6.48 Required inputs:

- TP : the value of technical provisions, calculated according to sections 2.2-2.5.

- A: the market value of investment assets, valued according to section 2.9.

- M_{SS} : the maximum value of sponsor support, as calculated above without credit risk

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

    This duration should correspond to the time (in years) the sponsor will need to pay to the IORP the full amount of required support. It should be the same as the one used in the calculation of the "maximum possible sponsor support".

    i: Discount factor which should reflect the appropriate risk free rate for the duration

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

    RR : the expected recovery rate of sponsor support by the IORP on default, which should not exceed 50%. For the purpose of this QIS, 50% can be assumed but IORPs may use other figures if appropriate stating the reasons why.

Calculation

HBS.6.49 In carrying out this calculation a spreadsheet will be developed by EIOPA meaning that only the inputs to the calculation will be required from IORPs.

HBS.6.50 **Step 1:** In the case of unlimited sponsor support, calculate the annual payments the sponsor would need to make assuming they are constant in cash terms and not linked to (for example) inflation to recover a shortfall in assets given the discount rate and duration. If this value exceeds the maximum sponsor support the projected cash-flows should be adjusted downwards.

$$CF_t = min \left[\frac{(TP-A)}{\left[\frac{1 - \frac{1}{(1+i)^d}}{i} \right]} ; \frac{(M_{SS})}{\left[\frac{1 - \frac{1}{(1+i)^d}}{i} \right]} \right]^d$$

HBS.6.51 **Step 2:** Calculate the probability weighted present value of these cash flows (SS_{CF}) to take into account insolvency risk.

$$SS_{CF} = \sum_{t=1}^{d} \frac{(1-p_{def})^t}{(1+i)^t} CF_t$$

HBS.6.52 **Step 3 -** Calculate the probability weighted discounted value of funds to be recovered from the sponsor in the event of default (SS_{REC}). This equals the sum over time of the probability of default at time t multiplied by the funding gap at that time multiplied by the recovery rate.

- For example, the probability that the sponsor defaults in year 2 equals the probability that the sponsor did not default in year 1 (=(1-PD$_1$)) times the probability of default in time 2 (=PD$_2$).
- For example, the funding gap in year 2 equals the value of technical provisions in year 0 times the return in year 1 and 2 (=TP x $(1+i)^2$) minus the value of assets in year 0 plus the return in year 1 and 2 (=A x $(1+i)^2$) minus the additional contributions received in year 1 plus the return on that cash-flow (CF$_1$ x (1+i)).

$$SS_{REC} = \sum_{t=1}^{d} \frac{(1-p_{def})^{t-1} p_{def}}{(1+i)^t} \cdot RR \cdot \left[TP(1+i)^t - A(1+i)^t - \sum_{j=0}^{t-1} CF_j(1+i)^{t-j} \right]$$

HBS.6.53 **Step 4:** The total value of sponsor support (SS$_{FV}$) equals the sum of values in step 2 and 3.

$$SS_{FV} = SS_{CF} + SS_{REC}$$

HBS.6.54 **Figure:** Probability tree sponsor support

Cumulative probability: $(1-p_{ccf}) \times (1-p_{def}) \times (1-p_{def})$
Cash flow: CF_3

$1-p_{def}$

Cumulative probability: $(1-p_{def}) \times (1-p_{def})$
Cash flow: CF_2

$1-p_{def}$

p_{def}

Cumulative probability: $(1-p_{def})$
Cash flow: CF_1

Cumulative probability: $(1-p_{ccf}) \times (1-p_{def}) \times p_{def}$
Cash flow (REC_3): $RR \times [(TP \times (1+ i)^3 - A \times (1+i)^3 - CF_1 \times (1 + i)^2 - CF_2 \times (1+ i)]$

$1-p_{def}$

p_{def}

Cumulative probability: $(1-p_{def}) \times p_{def}$
Cash flow (REC_2): $RR \times [(TP \times (1+ i)^2 - A \times (1+i)^2 - CF_1 \times (1 + i)]$

p_{def}

Cumulative probability: p_{def}
Cash flow (REC_1): $RR \times [(TP \times (1+ i) - A \times (1+i)]$
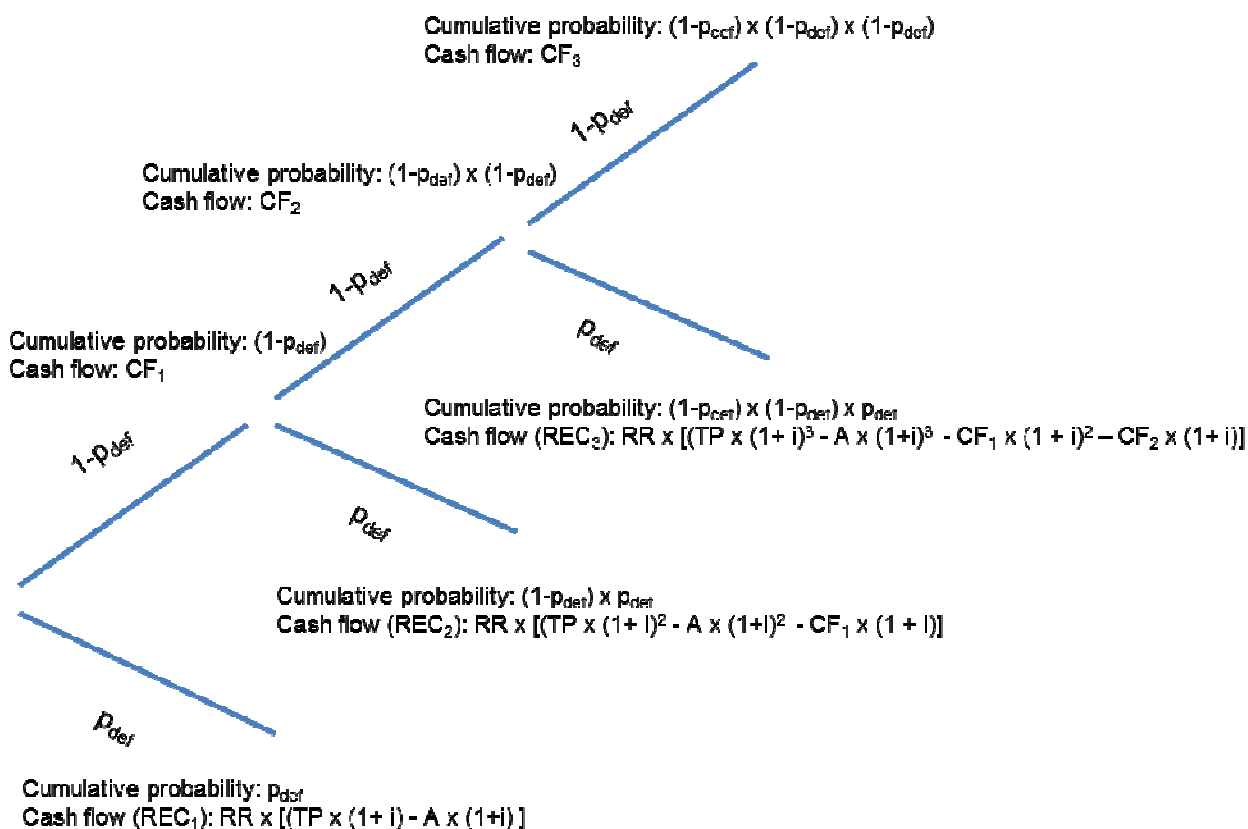
Loss absorbing capacity of sponsor support

HBS.6.55   The valuation of sponsor support as a market consistent value of the support from the sponsor to the IORP gives an "average" value of the sponsor support. However, the actual value of the sponsor support in adverse scenarios can exceed the average value.

HBS.6.56   The additional sponsor support above that of the average value calculated as an asset for the holistic balance sheet can be calculated using the two simplifications described above by changing the values of assets and liabilities to their "post shock" level for each scenario. The change in value of sponsor support will reflect its loss absorbing capacity, and will duly reduce the SCR (see section 3.2).

HBS.6.57   This calculation of the risk mitigation effect of sponsor support should be done using an approach whereby the calculation of the change in the net asset value (NAV) for each module of the SCR is adjusted to reflect the risk mitigating effect of sponsor support (see section 3.2). The total effects can then be aggregated.

Option: Valuing sponsor support as an ancillary own fund

HBS.6.58   While EIOPA's conditional advice to the Commission recommends valuing sponsor support as an asset and as a risk mitigation mechanism, EIOPA will be looking at the impacts of taking into account sponsor support as an ancillary own fund item in the QIS.

HBS.6.59   As far as valuation is concerned, the methodology for doing so will follow that of valuing the maximum value of sponsor support and this shall be used as the value for sponsor support as an ancillary own fund.

Pension protection schemes

HBS.6.60   IORPs should include the value of pension protection schemes as an asset on the holistic balance sheet. EIOPA's advice makes clear that the financial commitments arising from pension promises can be secured in different ways and that Member States have chosen different ways and mechanisms to secure these commitments. Pension protection schemes play an important role in some member states being part of a holistic view of the benefits and security for members and beneficiaries as a whole.

HBS.6.61   Where a pension protection scheme does not cover maximum members' benefits it cannot provide certainty that the maximum benefits will be paid, but only provides for certainty that a defined minimum 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.

HBS.6.62   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 security mechanisms, including assets of the IORP and a solvent sponsor meeting the definition of 'conditional benefits' as set out by EIOPA.

HBS.6.63   The overall confidence level is therefore still satisfied since assets are sufficient to meet the technical provisions. The pension protection scheme can therefore be seen to 'satisfy' requirements for a level of security (or confidence) that may be required under the holistic balance sheet approach.

HBS.6.64   For transparency purposes, the holistic balance sheet will show the two types best estimates including those conditional on certain events – namely in this case the solvency or insolvency of the sponsor (see HBS.2.42-45) – and disclosure of the strength of the mechanisms attached to each would be necessary. In this case the maximum benefits and the level payable by the pension protection scheme should be transparent.

HBS.6.65   However, it would also be necessary to have in place appropriate requirements that apply to the IORP regarding the level of assets and other mechanisms that are available. Namely, to have appropriate governance to mitigate the risk of the IORP relying on the pension protection scheme for its security – moral hazard issues.

HBS.6.66   The default risk of pension protection schemes is assumed to be zero for the purpose of this QIS. This may result in an overestimation of the value of pension protection schemes and an underestimation of the SCR, as an increase in the default risk of the protection scheme is not taken into account. Any analysis regarding the creditworthiness of pension protection

schemes would need to be done by member states or EIOPA and does not require IORPs to carry out any calculations.

Valuation as an asset on the holistic balance sheet

HBS.6.67   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 minimum level of benefits.

HBS.6.68   The valuation should take into account:

- The probability of default of the sponsor, as derived for the valuation sponsor support (see HBS.6.15-16).

- 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 HBS.6.17).

HBS.6.69   The value of the pension protection arrangements at the time of sponsor default equals the value of future benefits guaranteed by the pension protection scheme minus the level of funding and funding available at that time. If this figure is negative then the value of the pension protection fund equals zero.

HBS.6.70   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 protection schemes guarantees benefits for a full 100% then the present value equals the value of technical provisions. If 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 maximum value are paid are taken into account in the best estimate of the liabilities (see HBS.4.42-45).

HBS.6.71   In case a pension protection scheme covers 100% of the benefits and provided it is sufficiently strong, its value is equal to the funding gap that would appear in the holistic balance sheet (including sponsor support as an asset) without the pension protection scheme. In other words, in this case the value of the pension protection scheme closes the gap.

HBS.6.72   For other types of pension protection schemes, IORPs may use the following simplification to determine the value of the pension protection scheme.

Simplification – Deterministic value of pension protection schemes

HBS.6.73   This valuation follows the principles used in the deterministic valuation of sponsor support (Simplification 2) and a spreadsheet will be provided meaning that only the inputs are required from IORPs.

Input

HBS.6.74 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, IORPs can allow for this using a suitable approximation method.

Calculation

HBS.6.75 A pension protection scheme will only generate a cash flow in the branches where the sponsor defaults. This can be modelled by calculating the probability weighted present value of funds to be recovered from the pension protection scheme in the event of default of the sponsor.

HBS.6.76 The value of the pension protection arrangements at the time of sponsor default equals the present value of future benefits guaranteed by the pension protection scheme minus the level of funding available at that time. If this figure is negative then the value of the pension protection scheme equals zero. The future value should be discounted back to attain the present value and weighed with the cumulative probability of sponsor defaults at that specific time.

HBS.6.77 So, the market value of the pension protection scheme (PPF$_{FV}$) equals the sum over time of the probability of default at time t multiplied by the expected value of cash-flows to be received from the pension protection scheme. The latter can be approximated by the 'coverage rate' of the pension protection scheme (*CR*) multiplied by the value of technical provisions minus assets available in the IORP, including the funds recovered from the sponsor (*REC*). If the value of assets exceeds the coverage of the pension protection scheme in year t then the value of the cash flow is zero.

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

where

$$REC_t = RR \cdot \left| TP(1+i)^t - A(1+i)^t - \sum_{j=0}^{t-1} CF_j(1+i)^{t-j} \right|$$

HBS.6.78 **Figure**: Probability tree pension protection scheme

Cumulative probability: $(1-p_{def})$ x $(1-p_{def})$ x $(1-p_{def})$
Cash flow: 0

$1-p_{def}$

Cumulative probability: $(1-p_{def})$ x $(1-p_{def})$
Cash flow: 0

$1-p_{def}$

p_{def}

Cumulative probability: $(1-p_{def})$
Cash flow: 0

Cumulative probability: $(1-p_{def})$ x $(1-p_{def})$ x p_{def}
Cash flow: $\max [CR \times TP \times (1+ i)^3 - \{ A \times (1+i)^3 + CF_1 \times (1+i)^2 + CF_2 \times (1+i) + REC_3\};0]$

$1-p_{def}$

p_{def}

Cumulative probability: $(1-p_{def})$ x (p_{def})
Cash flow: $\max [CR \times TP \times (1+ i)^2 - \{ A \times (1+i)^2 + CF_1 \times (1+i) + REC_2\};0]$

p_{def}

Cumulative probability: p_{def}
Cash flow: $\max [CR \times TP \times (1+ i) - \{ A \times (1+i) + REC_1\};0]$

Option: Take into account pension protection schemes by reducing the credit risk of the sponsor

HBS.6.79   Deriving a value of the effect of the pension protection scheme under this option should look at the increase in the level of sponsor support provided by the backup of a pension protection scheme. Under this approach, the credit risk of the sponsor can be adjusted to take account of the existence of the pension protection scheme.

HBS.6.80   A further calculation of the value of sponsor support is therefore required, but removing credit risk from the calculations.

HBS.6.81   The effect of the pension protection scheme on the holistic balance sheet is then derived by the difference between:

1. Value of sponsor support without pension protection scheme, following the approach presented above, in particular having allowed for credit risk of the sponsor.
2. Value of sponsor support with pension protection scheme, by appropriately reducing the credit risk applied in the valuation of sponsor support. If the pension protection scheme covers 100% of benefits then the default risk of the sponsor can be reduced to zero.

HBS.6.82   Then the effect of the pension protection scheme on the holistic balance sheet: = "value after step 2" – "value after step 1". This treats the pension protection scheme as improving the credit risk of the sponsor.

HBS.6.83   The value in this option of the effect of the pension protection scheme on the holistic balance sheet, which would show as an increase in the value of sponsor support should be reported separately in the QIS.

Loss absorbing capacity of pension protection schemes

HBS.6.84   When assessing the SCR for stresses on the value of assets, technical provisions and sponsor support under scenarios in the calculation of the counterparty default risk, there will be a direct reduction of the SCR, obtained by reducing the probability of default and / or the loss given default of the sponsor.

HBS.6.85   The same simplifications and spreadsheets as used to value the pension protection scheme can be used to estimate the loss-absorbing capacity pension protection schemes in the calculation of the SCR. Namely the value of the assets and liabilities "post shock" can be used and the calculation rerun.

HBS.6.86   The change in value of the pension protections scheme will reflect its loss absorbing capacity, and will duly reduce the SCR.

Maximum loss-absorbing capacity of pension protection schemes

HBS.6.87   The role of the pension protection scheme is to provide for security that benefits will be paid which is the function behind the setting of a SCR. Following this logic, and provided that the pension protection scheme is sufficiently strong, the 'value' of the PPS can be seen as a risk mitigation mechanism with full loss absorbency to reduce the SCR to zero.

HBS.6.88   IORPs should calculate the maximum value of pension protection schemes to be used in the SCR calculation to ensure that the maximum loss absorbency of security mechanisms exceeds the maximum value of sponsor support and includes the full loss absorbing capacity of pension protection schemes (see Section 3.2). This can be approximated by multiplying the average coverage rate of the pension protection scheme by the value of technical provisions.

Option: Exclude pension protection schemes

HBS.6.89   Under this option IORPs should ignore the pension protection scheme altogether in the QIS valuations.

HBS.6.90   This approach would correspond to the situation where the pension protection scheme would provide members and beneficiaries with an additional level of protection, above the protection offered by the prudential framework (which would in this case exclude pension protection schemes), and therefore not measured within the holistic balance sheet.

2.7. Recoverables from insurance contracts

HBS.7.1 IORPs should include the value of recoverables from (re)insurance contracts and special purpose vehicles as an asset on the holistic balance sheet.

HBS.7.2 The calculation by IORPs of amounts recoverable from (re)insurance contracts and special purpose vehicles should follow the same principles and methodology as presented in this section for the calculation of other parts of the technical provisions.

HBS.7.3 There is no need however to calculate a risk margin for amounts recoverable from (re)insurance contracts and special purpose vehicles because the single 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 special purpose vehicles).

HBS.7.4 When calculating amounts recoverable from (re)insurance contracts and special purpose vehicles, IORPs should take account of the time difference between recoveries and direct payments.

HBS.7.5 Where for certain types of (re)insurance and special purpose vehicles, 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.

HBS.7.6 The result from that calculation should be adjusted to take account of expected losses due to default of the counterparty. That adjustment should be calculated separately and should be based on an assessment of the probability of default of the counterparty, whether this arises from insolvency, dispute or another reason, and the average loss resulting there from (loss-given-default).

HBS.7.7 For the purpose of calculating the amounts recoverable from (re)insurance contracts and special purpose vehicles, the cash-flows should only include payments in relation to compensation of pension obligations. Payments in relation to other events or settled insurance claims should not be accounted as amounts recoverable from (re)insurance contracts and special purpose vehicles. 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.

HBS.7.8 Debtors and creditors that relate to settled claims of members or beneficiaries should not be included in the recoverable.

HBS.7.9 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.

HBS.7.10 Expenses which the IORP incurs in relation to the management and administration of (re)insurance and special purpose vehicle contracts

should be allowed for in the best estimate, calculated gross, without deduction of the amounts recoverable from (re)insurance contracts and special purpose vehicles. But no allowance for expenses relate to the internal processes should be made in the recoverables.

Adjustment of recoverables due to expected default

Definition of the adjustment

HBS.7.11 The result from the calculation of the previous section should be adjusted to take account of expected losses due to default of the counterparty. That adjustment should be calculated separately and should be based on an assessment of the probability of default of the counterparty, whether this arises from insolvency, dispute or another reason, and the average loss resulting there from (loss-given-default).

HBS.7.12 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 and after allowing for the effect of any additional risk mitigating instrument.

HBS.7.13 This calculation should take into account possible default events over the lifetime of the rights arising from the corresponding (re)insurance contract or special purpose vehicle and the dependence on time of the probability of default.

HBS.7.14 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, its allowance, would not change the fundamental conclusions of the example) Then the losses-given-default are as follows:

Default during year	Loss-given-default
1	$-60\% \cdot (C_1 + C_2 + C_3)$
2	$-60\% \cdot (C_2 + C_3)$
3	$-60\% \cdot C_3$

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 $40\% \cdot (C2 + C3)$. As 60% of the recoveries are lost, the loss-given-default is $-60\% \cdot (C2 + C3)$.

HBS.7.15   The adjustment for counterparty default in this example is the following sum:

$$AdjCD = PD1·(-60\%·(C1 + C2 + C3))$$

$$+ PD2·(-60\%·(C2 + C3))$$

$$+ PD3·(-60\%·C3).$$

HBS.7.16   This calculation should be carried out separately by counterparty and each line of business,

Probability of default (PD)

HBS.7.17   The probability of default of special purpose vehicles should be calculated according to the average rating of assets held by the special purpose vehicle, unless there is a reliable basis for an alternative calculation.

HBS.7.18   The determination of the adjustment for counterparty default should take into account possible default events during the whole run-off period of the recoverables.

HBS.7.19   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

$$PD1·(-60\%·(C1 + C2 + C3)).$$

HBS.7.20   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.

HBS.7.21   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, rating judgements, information relating to the supervisory solvency assessment, and the financial reporting of the counterparty. The applied methods should guarantee market consistency. The IORP should not rely on information of a third party without assessing that the information is current, reliable and credible.

HBS.7.22   In particular, the assessment of the probability of default should be based on methods that guarantee the market consistency of the estimates of PD.

HBS.7.23   Some criteria to assess the reliability of the information might be, e.g., neutrality, prudency and completeness in all material aspects.

HBS.7.24   The IORP may consider for this purpose methods generally accepted and applied in financial markets (i.e., 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.

HBS.7.25   In the case of (re)insurance recoverables from a SPV, when the IORP has no reliable source to estimate its probability of default, (i.e. there is a lack of rating) 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 CP36: Same treatment as in the case referred above.

- Others SPV: They should be considered as unrated.

HBS.7.26   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.

HBS.7.27   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.

HBS.7.28   In many cases only through-the-cycle estimates may be available. For example, the credit ratings 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.

HBS.7.29   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.

HBS.7.30   For example, the probability that the counterparty defaults during the next two years is higher than the probability of default during the next year.

HBS.7.31   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

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

HBS.7.32   This does not preclude the use of simplifications where the effect of them is not material at this aspect (see item D below).

Recovery rate (RR)

HBS.7.33   The recovery rate is the share of the debts that the counterparty will still be able to honour in case of default.

HBS.7.34   If no reliable estimate of the recovery rate of a counterparty is available, no rate higher than 50% should be used.

HBS.7.35   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.

HBS.7.36   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.

HBS.7.37   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.

Simplifications

HBS.7.38   Recoverables from (re)insurance contracts or special purpose vehicles should take account of expected losses due to default of the counterparty. This should be done in two steps. Firstly, the recoverables are calculated without an allowance for counterparty default. Secondly, an adjustment for counterparty default is applied to the result of the first step.

HBS.7.39   In many cases, in particular if the counterparty is of good credit quality, the adjustment for counterparty default will be rather small compared to the (re)insurance recoverables. In these cases, the following simplified calculation can be applied provided the IORP meets the general framework to apply simplifications in respect technical provisions:

where

AdjCD = Adjustment for counterparty default

RR = Recovery rate of the counterparty

BERec = Best estimate of recoverables taking not account of expected loss

due to default of the counterparty

Durmod = Modified duration of the recoverables

PD = Probability of default of the counterparty for the time horizon of one year

HBS.7.40 The simplification should only be applied if the adjustment can be expected to be smaller than 5 per cent and there are no indications that the simplification formula leads to a significant underestimation.

HBS.7.41 Since the simplification above described depends to a certain extent on the values estimated for the parameters RR and PD, for the sake of harmonization and comparability, the following table provides default values for these parameters, values which would apply those undertakings with insufficient resources to derive reliably RR and PD according a market consistent methodology.

	Recovery rate	Probability of default(1)	Adjustment of best estimate of (re)insurance recoverables and SPVs, acoording the duration of expected cash flows. Expressed as a percentage of the best estimate. ((1-RR) * PD / (1 – PD) * Dur)				
			1 year	2 year	3 year	4 year	5 year
AAA	50%	0,05%	0,03%	0,05%	0,08%	0,10%	0,13%
AA	45%	0,10%	0,06%	0,11%	0,17%	0,22%	0,28%
A	40%	0,20%	0,12%	0,24%	0,36%	0,48%	0,60%
BBB	35%	0,50%	0,33%	0,65%	0,98%	1,31%	1,63%
BB	20%	2,00%	1,63%	3,27%	4,90%	Non applicable	
Others	10%	10.0%	Simplification non applicable according 5 per cent threshold set out in these specificayions				

(1) Simplification non applicable according the 5 per cent threshold.

HBS.7.42 It is allowed to calculate the adjustment for recoverables by using an alternative method but in this case, a clear description of this alternative method should be provided.

2.8.   Discount rates

HBS.8.1.   For the purpose of this QIS IORPs shall value the best estimate of technical provisions with two different discount rates (level A and level B).

Basic risk-free interest rate ("Level A")

HBS.8.2.   For liabilities expressed in Euro, Pound sterling and Swedish krona these specifications provide participants with one complete risk-free interest rate term structure.

HBS.8.3.   For valuation of level A technical provisions, the discount curve to be used is provided together with these specifications.

HBS.8.4.   The rates of the relevant risk-free interest rate term structure to calculate the best estimate shall be taken as the rates of a basic risk-free interest rate term structure.

HBS.8.5.   The relevant risk-free interest rate term structure shall be calculated separately for each currency and maturity, based on information and data relevant for that currency and that maturity. It shall be determined in a transparent, prudent, reliable and objective manner.

HBS.8.6.   The ultimate forward rate is used to extrapolate interest rates where no liquid market is available. The extrapolation method used is the Smith-Wilson procedure.

HBS.8.7.   The relevant parameters used within the Smith-Wilson procedure are shown in the table below.

Currencies	EUR, GBP, SEK
Calculation date	30 December 2011
Data	Swap bid rates
Credit risk adjustment	10bp across maturities
Last liquid point	EUR: 20yrs GBP: 50yrs SEK: 10yrs
Method applied to extrapolation and interpolation	Smith-Wilson approach Smith-Wilson approach
Speed of convergence alpha	0.1
Maximum period of convergence	40 years from last liquid point
Ultimate forward rate	4.2%

HBS.8.8.   The relevant parameters for each currency are:

   a.   The last liquid point;

   b.   The ultimate forward rate;

   c.   The speed of convergence *alpha*;

HBS.8.9.   The following procedure is used in order to establish the relevant discount curve:

   a. Available swap rates are used to determine an zero coupon interest rate curve; these swap rates are market swap rates on the 30th of December 2011.

   b. For durations less than one year, the discount rate is the same as the one year rate.

   c. 10 basis points (0.1%) shall be deducted from each interest rate point, to account for credit risk;

   d. Beyond the last liquid point, interest rates will be extrapolated using the ultimate forward rate.

HBS.8.10. EIOPA will provide participating IORPs with a tool so they can apply the Smith-Wilson procedure themselves.

Option: Basic risk-free interest rate according to QIS5 extrapolation

HBS.8.11. In comparison with the QIS5 approach, the last liquid point for EUR is 20 years rather than 30 years and the maximum period of convergence is 40 years from the last liquid point, rather than at a maturity of at least 90 years (60 years after the last liquid point in case of EUR). The Commission has asked EIOPA to add as an option the basic risk-free interest rate for EUR, GBP and SEK using the QIS5 extrapolation parameters.

Option: Basic risk-free interest rate to reflect nature of pension liabilities

HBS.8.12. Under this option, IORPs should value the best estimate of technical provisions by reference of an upward parallel, vertical shift to basic risk-free interest rate curve of 50 basis points as an adjustment for market illiquidity and credit risk exaggeration in stressed market conditions. This adjustment serves as an approximation for the so-called counter cyclical premium (CCP), as requested by the Commission.[5]

HBS.8.13. The Commission has also asked EIOPA to provide IORPs with the possibility to test the so-called matching premium under this option, in which case IORPs may not apply the CCP. The matching premium may be calculated for those pension liabilities that meet the conditions as set out in Annex 2. EIOPA will develop approximations for the calibration of the probability of default and the downgrading of assets as well as some simplifications for methodology for the long-term average of the fundamental spread.

HBS.8.14. The Commission, Council and European Parliament are currently discussing the issues mentioned in HBS.8.11-13 for insurers providing long-term guarantees in the context of the Omnibus II Directive. The outcomes of these discussions will be taken into account in the final technical specifications of the QIS.

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[5] EIOPA will still have to consider including counter cyclical premium risk in the calculation of the SCR as the counter cyclical premium impacts on the level of technical provisions.

Sensitivity analysis: Discount rate for sensitivity analysis for level A

HBS.8.15. To analyse the sensitivity to changes in the level of discount rates IORPs shall calculate the best estimate of technical provisions with an interest rate structure where the Level A-rate is in one case lowered by 50 basis points and in the other case increased by a parallel shift of 50 basis points, the same as the option to reflect the nature of pension liabilities

Expected return ("Level B")

HBS.8.16. The level B discount rate shall be derived as a function of a simplified strategic asset mix. In this mix, no account should be given to any tactical deviations.

HBS.8.17. The simplified strategic asset mix is to be determined by categorising all investments in either fixed income or non-fixed income. The fixed income assets consist of all bonds (including inflation-linked bonds, variable rate bonds etc.), deposits and loans and receivables which yield a current interest. Any other investment is to be considered non fixed income for the purpose of this classification.

HBS.8.18. The expected return for fixed income assets should be equal to the average weighted return of the strategic fixed income portfolio of the IORP. This return is determined based on the part of the fixed income portfolio which consists of government bonds (for the rating classes AAA and AA or lower), corporate bonds and bonds issued by banks. The remaining part of the fixed income portfolio is assumed to have the same average yield. The different classes of bonds will be assumed to yield the following returns which are based on data on the 30th of December 2011:

   a. AAA Government bonds: 2,98 % (ECB: AAA rated euro area central government bonds 15 years)

   b. AA or lower Government bonds: 4,51 % (iBoxx € Eurozone AA)

   c. AA Corporate bonds: 3,88 % (Barclays Euro aggregate AA index 10-20 years)

   d. AA Bank bonds: 3,96 % (Bloomberg Euro Composite AA banks 15 years)

The average of these yields (weighted according to the strategic composition of the bonds portfolio of the IORP) shall be used as the yield for fixed income investments. For the purpose of this QIS this approach is deemed to serve well as a simplified approximation for the yield on a diversified portfolio of fixed income assets.

In non-euro area member states, a suitable adjustment can be made reflecting the currency of the investments.

HBS.8.19. Non fixed income investments will be assumed to yield a return of 5,98 % which was calculated by assuming an average risk premium of 3% above the yield for AAA government bonds.

HBS.8.20. The weighted average (weighed according to the simplified strategic asset mix) of the two yields shall be used as the discount rate for level B technical provisions.

HBS.8.21. The discount rate for level B technical provisions can therefore be expressed as:

$$A_{fi} * Y_{avfi}\% + A_{nfi} * 5,98\%$$

Where A_{fi} is the percentage of fixed income assets according to HBS.8.14., A_{nfi} is the percentage of non-fixed income assets according to HBS.8.14 and Y_{avfi} is the average yield for fixed income investments according to HBS.8.15.

Expected inflation and salary increases

HBS.8.22. Some IORPs may adjust benefits to inflation or salary increases. This can be the case for the best estimate of the unconditional benefits (for example in the case of an end-salary scheme or in the case of an indexation according to a price-index), 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 fund). Whenever expected inflation rates or salary increases are needed, the IORPs should use the following:

HBS.8.23. For expected inflation a yearly percentage of 2%.

HBS.8.24. For expected salary increases a yearly percentage of 3%.

2.9. Valuation other assets and other liabilities

HBS.9.1. IORPs shall value other assets and other liabilities on a market consistent basis, in line with EIOPA's advice.

No subsequent adjustment should be made to take account of the change in the own credit standing of the IORP when valuing financial liabilities.

HBS.9.2. For the assessment of other assets and other liabilities IORPs should apply the provisions stated in paragraphs HBS.9.3 to HBS.9.9 to the extent possible and necessary for the general purpose of this QIS. 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 for the purpose of this QIS, e.g. by using values based on national accounting standards.

HBS.9.3. Valuation assumptions: IORPs shall value other assets and other liabilities based on the assumption that the institution will provide occupational retirement benefits as a going concern.

HBS.9.4. Valuation methodology – general principles

(1) Unless otherwise stated, assets and liabilities other than technical provisions and security mechanisms shall be recognised in conformity with the international accounting standards, as endorsed by the Commission in accordance with Regulation (EC) No 1606/2002.

(2) Valuation of assets and liabilities other than technical provisions and security mechanisms shall be carried out, unless otherwise stated, in conformity with international accounting standards, as 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 HBS.9.1. If those standards allow for more than one valuation method, only valuation methods that are consistent with HBS.9.1 can be used.

(3) Where the valuation methods included in international accounting standards, as 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 HBS.9.1, IORPs shall use the other valuation methods that have been deemed to be consistent with HBS.9.1.

(4) Individual assets and liabilities shall be valued separately.

(5) Paragraphs HBS.9.5 to HBS.9.9 shall apply to the recognition and valuation of assets and liabilities other than technical provisions and security mechanisms.

HBS.9.5. Valuation methodology – valuation hierarchy

(1) The use of quoted market prices in active markets for the same assets or liabilities shall be the default valuation method, regardless of whether international accounting standards, as endorsed by the Commission in accordance with Regulation (EC) No 1606/2002 allow valuation methods that are consistent with HBS.9.1 to follow a different valuation hierarchy.

(2) Where the use of quoted market prices for the same assets or liabilities is not possible, quoted market prices in active markets for similar assets and liabilities with adjustments to reflect differences shall be used.

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

(4) Where the criteria referred to in paragraph 3 are not satisfied, IORPs shall, unless otherwise stated, use alternative valuation methods, other than those stated in the paragraph 2, provided that those methods are consistent with the principles in HBS.9.1.

(5) The use of alternative valuation methods shall make maximum use of relevant market inputs and rely as little as possible on IORP-specific inputs.

HBS.9.6.   Recognition of contingent liabilities

(1) IORPs shall recognise as liabilities contingent liabilities, as defined in international accounting standards, as endorsed by the Commission in accordance with Regulation (EC) No 1606/2002, that are material.

(2) Contingent liabilities are material if information about the current or potential size or nature of that liability could influence the decision-making or judgement of the intended user of that information.

HBS.9.7.   Valuation methods for specific assets: IORPs shall value:

(1) goodwill at zero;

(2) intangible assets, other than goodwill, at zero, 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 HBS.9.5(1), in which case the asset shall be valued in accordance with paragraph HBS.9.5;

(3) deferred tax assets in accordance with paragraph HBS.9.9;

HBS.9.8.   Valuation methods for specific liabilities: IORPs shall value:

(1) Financial liabilities, as referred to in international accounting standards, as endorsed by the Commission in accordance with Regulation (EC) No 1606/2002, in conformity with those international accounting standards 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 HBS.9.6, based on 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.

(3) Deferred tax liabilities in accordance with paragraph HBS.9.9.

HBS.9.9.   Deferred taxes

(1) IORPs shall recognise and value deferred taxes in relation to all assets and liabilities that are recognised for solvency or tax purposes in

conformity with international accounting standards, as endorsed by the Commission in accordance with Regulation (EC) No 1606/2002.

(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 recognised and valued in accordance with HBS.9.1 and the values ascribed to assets and liabilities as recognised and valued for tax purposes.

(3) In the case of deferred tax assets the IORP shall be able to demonstrate to the supervisory authority that 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.
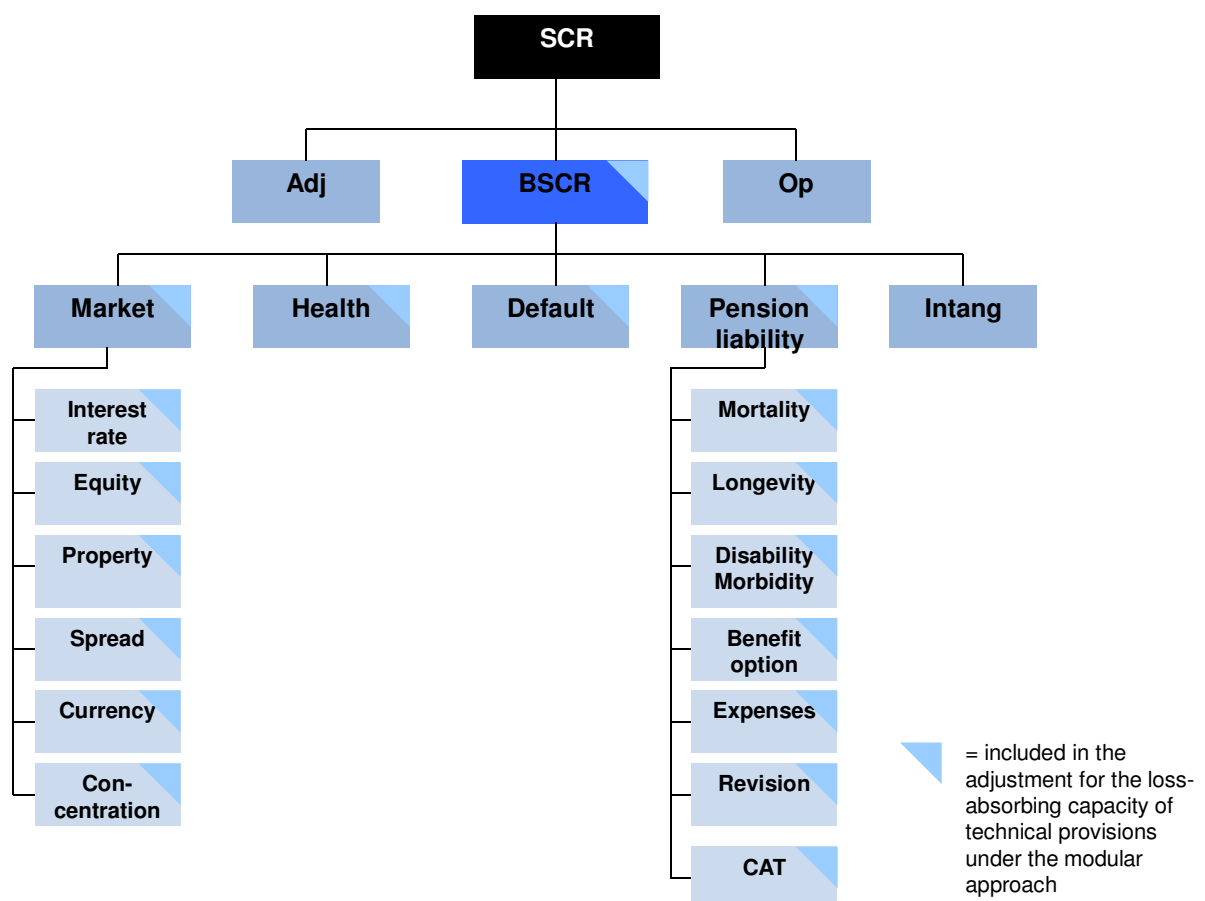
3. SCR – Standard formula

3.1. Overall structure of the SCR

SCR General remarks

Overview

SCR.1.1. The calculation of the Solvency Capital Requirement (SCR) according to the standard formula is divided into modules and sub-modules as follows:

= included in the adjustment for the loss-absorbing capacity of technical provisions under the modular approach

SCR.1.2. For each module and sub-module, the specifications are split into the following subsections:

- Description: this defines the scope of the module or sub-module, and gives a definition of the relevant sub-risk;

- Input: this lists the input data requirements;

- Output: this describes the output data generated by the module;

- Calculation: this sets out how the output is derived from the input;

- Simplification: this sets out how the calculation can be simplified under certain conditions. Further simplifications can be made by IORPs, if appropriate.

Technical provisions in the SCR standard formula calculations

SCR.1.3. For the purposes of the SCR standard formula calculations, technical provisions should be valued in accordance with the specifications laid out in the section on valuation. To avoid circularity in the calculation, any reference to technical provisions within the calculations for the individual SCR modules is to be understood to exclude the risk margin.

SCR.1.4. The SCR standard formula calculations are to be based on the Level A technical provisions as described in the section on valuation.

Scope of pension liability and health modules

SCR.1.5. The SCR standard formula includes modules for pension liability risk and health risk. The pension liability risk module captures all risks of the IORP, which are related directly to the obligations of the IORP, with the exception of some parts of health risk.

SCR.1.6. The health risk module captures the parts of health risk which are not covered by the pension liability risk module. This module is likely to be relevant only for some participating member states.

Scenario-based calculations

SCR.1.7. For several sub-modules the calculation of the capital requirement is scenario-based: The capital requirement is determined as the impact of a specified scenario on the net asset value of the IORP (NAV).

SCR.1.8. The net asset value is defined as the difference between assets and liabilities. As explained above, for the purpose of the SCR standard formula calculations, the liabilities should not include the risk margin of technical provisions. Furthermore, the liabilities should not include subordinated liabilities.[6] The change of NAV resulting from the scenario is referred to as *ΔNAV*. *ΔNAV* is defined to be **positive** where the scenario results in a **loss** of NAV.

SCR.1.9. The scenarios should be interpreted in the following manner:

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[6] NAV = assets – liabilites whereby subordinated liabilities are excluded from liabilities. This ensures that NAV corresponds to basic own funds, i.e. the excess of assets over liabilities plus subordinated liabilities.

- The recalculation of technical provisions to determine the change in NAV should allow for any relevant adverse changes in option take-up behaviour of members and beneficiaries or sponsors under the scenario, if applicable.

- Where risk mitigation techniques meet the requirements set out in sections 3.9 and 3.10, their risk-mitigating effect should be taken into account in the analysis of the scenario.

- Where the scenario results in an increase of NAV, and therefore does not reflect a risk for the IORP, this should not lead to a "negative capital requirement". The corresponding capital requirement in such a situation is nil.

SCR.1.10. Future management actions of the management of the IORP should be taken into account in the scenario calculations in the following manner:

- To the extent that the scenario stress under consideration is considered to be an instantaneous stress, no management actions may be assumed to occur during the stress.

- However it may be necessary to reassess the value of the technical provisions after the stress. Assumptions about future management actions may be taken into account at this stage. The approach taken for the recalculation of the best estimate to assess the impact of the stress should be consistent with the approach taken in the initial valuation of the best estimate.

- Any assumptions regarding future management actions for the assessment of the standard formula SCR should be objective, realistic and verifiable. Guidance on these requirements can be found in the section on valuation (HBS.3.22 ff.).

Calibration

SCR.1.11. The SCR calculations defined in this QIS correspond to those used in QIS 5 for Solvency II. These were designed for a Value-at-Risk of the basic own funds (i.e. the excess of assets over liabilities plus subordinated liabilities) subject to a confidence level of 99.5% over a one-year period. The parameters and assumptions used for the calculation of the SCR in the QIS reflect this calibration objective only. The use of these parameters and assumptions does not predetermine a confidence level to be set in a possible review of the IORP Directive. They are just being used as an available starting basis for this QIS.

Options: 97.5% and 95% confidence level

SCR.1.12. EIOPA will also report the impact of other possible confidence levels, in particular 97.5% and 95%. However, the different modules of the standard formula calculation will not be recalibrated for these other confidence levels. Instead, the overall capital requirement of IORPs under the 99.5% confidence level will be adjusted to reflect the respective lower confidence levels using a common method to be developed by EIOPA. This adjustment will be performed by member states on the level of single IORPs after the QIS, before the respective data is then aggregated and sent to EIOPA. No calculations have to be performed on this by participating IORPs in this QIS.

SCR.1.13. To ensure that the different modules of the standard formula are calibrated in a consistent manner, the 99.5% Value-at-Risk calibration objective applies to each individual risk module.

SCR.1.14. For the aggregation of the individual risk modules to an overall SCR, linear correlation techniques are applied. The setting of the correlation coefficients is intended to reflect potential dependencies in the tail of the distributions, as well as the stability of any correlation assumptions under stress conditions.

Proportionality and simplifications

SCR.1.15. The principle of proportionality is intended to support the consistent application of the principles-based solvency requirements to all IORPs.

SCR.1.16. In this QIS, IORPs may apply to several parts of the standard formula calculation specified simplifications or further simplifications, if appropriate, provided that the simplified calculation is proportionate to the nature, scale and complexity of the risks.

SCR Calculation Structure

Overall SCR calculation

Description

SCR.1.17. The SCR is the end result of the standard formula calculation.

Input

SCR.1.18. The following input information is required:

$BSCR$ = Basic Solvency Capital Requirement

SCR_{op} = The capital requirement for operational risk

Adj = Adjustment for the loss absorbing effect of technical provisions, security mechanisms and deferred taxes

Output

SCR.1.19. This module delivers the following output information:

SCR = The overall standard formula capital requirement

Calculation

SCR.1.20. The SCR is determined as follows:

$SCR = BSCR + Adj1 + SCR_{Op} + Adj2$

Description

SCR.1.21. The Basic Solvency Capital Requirement (BSCR) is the Solvency Capital Requirement before any adjustments, combining capital requirements for five major risk categories.

Input

SCR.1.22. The following input information is required:

SCR_{mkt} = Capital requirement for market risk

SCR_{def} = Capital requirement for counterparty default risk

$SCR_{pension}$ = Capital requirement for pension liability risk

SCR_{health} = Capital requirement for health risk

$SCR_{intangibles}$ = Capital requirement for intangible assets risk

Output

SCR.1.23. The module delivers the following output:

BSCR = Basic Solvency Capital Requirement

Calculation

SCR.1.24. The BSCR is determined as follows:

$$BSCR = \sqrt{\sum_{ij} Corr_{ij} \times SCR_i \times SCR_j} + SCR_{intangibles}$$

where

$Corr_{i,j}$ = the entries of the correlation matrix $Corr$

SCR_i, SCR_j = Capital requirements for the individual SCR risks according to the rows and columns of the correlation matrix $Corr$.

$SCR_{intangibles}$ = the capital requirement for intangible asset risk calculated in accordance with SCR.4

SCR.1.25. The factor $Corr_{i,j}$ denotes the item set out in row i and in column j of the following correlation matrix $Corr$:

i \ j	Market	Default	Pension liability	Health
Market	1			
Default	0.25	1		
Pension liability	0.25	0.25	1	

Health	0.25	0.25	0.25	1

3.2. Loss-absorbing capacity of technical provisions, security mechanisms and deferred taxes

Technical provisions and security mechanisms

SCR.2.1. Technical provisions for pure conditional, pure discretionary or mixed benefits, as defined in section on valuation (HBS.4.23 ff.), may have the ability to absorb losses in a stress situation, meaning that their value is reduced in such a situation and such partly or fully compensates the effect of the stress situation on the holistic balance sheet of the IORP.

SCR.2.2. All types of pure conditional benefits, whether based on comprehensive benefit adjustment mechanisms, indexation mechanisms or other, may have a loss-absorbing capacity. Determining the extent of the loss-absorbing capacity may not be easy in all cases. In general, the more complex the conditions are, under which the conditional benefits are paid, the more difficult this will be.

SCR.2.3. In general, pure discretionary and mixed benefits will have full loss-absorbing capacity, i.e. the maximum loss-absorbency is equal to their value.

SCR.2.4. Ex post benefit reductions may or may not have full loss-absorbing capacity, depending on the conditions for reducing benefits in a stress situation.

SCR.2.5. Security mechanisms refer to all types of sponsor support and pension protection schemes (see section 2.6 for the definitions).

SCR.2.6. The loss-absorbing capacity of sponsor support will depend on the type of sponsor support (unlimited, limited, no automatic recourse, etc.), but also on the financial capacity of the sponsor to make additional contributions to the IORP or pay directly to members and beneficiaries (in the case of Form B of sponsor support).

SCR.2.7. The loss-absorbing capacity of pension protection schemes will be the overall value of the level of pension benefits covered by the arrangement.

Gross and net SCR calculations

SCR.2.8. The solvency capital requirement for market, pension liability and counterparty default risk should be derived under a gross calculation and two net calculations reflecting the loss-absorbing capacity of technical provisions and security mechanisms.

SCR.2.9. The gross calculation should be used to determine the Basic Solvency Capital Requirement and in the calculation of the adjustment for the loss-absorbing capacity of technical provisions. In the calculation of the adjustment, the result of the gross calculation is used to prevent double

counting of risk mitigating effects. Moreover it is an additional source of information about the risk profile of the IORP. The gross calculation does not reflect all aspects of the economic reality as it ignores the loss-absorbing effect technical provisions, security mechanisms and deferred taxes.

SCR.2.10. The net calculation of the solvency capital requirement with respect to loss-absorbing capacity of technical provisions and security mechanisms should be defined as follows:

The IORP is able to vary its assumptions on the payment of pure conditional benefits (e. g. future bonus rates in the case of profit-sharing, conditional indexation of pension accruals and benefits, benefit reductions in the event of sponsor default), pure discretionary and mixed benefits and may reduce accrued benefits as a measure of the last resort in response to the shock being tested, based on reasonable expectations and having regard to realistic management actions.

The IORP is backed up by a sponsor that is able to increase its support and possibly by a pension protection arrangement guaranteeing a minimum level of benefits that increases in value in response to the shock being tested, based on reasonable expectations and having regard to realistic contributions by the sponsor.

The establishment of the total net SCR for each (sub-)module involves the calculation of a stressed balance sheet and comparing it to the unstressed balance sheet that was used to calculate the excess of assets over liabilities. Therefore, for each (sub-)module IORPs can derive the best estimate value of the technical provisions relating to pure conditional, pure discretionary and mixed benefits and benefits subject to ex post reductions as well as the value of sponsor support and pension protection schemes from both balance sheets.

The net SCR relating to loss-absorbency of technical provisions can then be established by assuming that the value of security mechanisms has not changed. The net SCR relating to loss-absorbency of security mechanisms can then be established by assuming that the value of technical provisions has not changed as a result of the scenario.

SCR.2.11. The gross calculation should be defined as follows:

The gross SCR can be derived by assuming that both the value of technical provisions and security mechanisms has not changed as a result of the scenario.

Calculation of the adjustment for loss-absorbency of technical provisions, security mechanisms and deferred taxes

SCR.2.12. The adjustment for the loss-absorbency of technical provisions, security mechanisms and deferred taxes reflects the potential compensation of unexpected losses through a decrease in technical provisions or deferred taxes. In relation to technical provisions the adjustment takes account of the risk mitigating effect provided by pure conditional, pure discretionary and mixed benefits to the extent IORPs can establish that a reduction in such benefits may be used to cover unexpected losses when they arrive.

SCR.2.13. The adjustment for loss-absorbency of technical provisions, security mechanisms and deferred taxes is split into three parts as follows:

$$Adj1 = Adj_{TP} + Adj_{SM} + Adj_{DT}$$

where

Adj_{TP} = adjustment for loss-absorbency of technical provisions

Adj_{SM} = adjustment for loss-absorbency of security mechanisms

Adj_{DT} = adjustment for loss-absorbency of deferred taxes

SCR.2.14. The adjustment for loss-absorbency of technical provisions, security mechnisms and deferred taxes should not be positive.

Adjustment for loss-absorbency of technical provisions and security mechanisms

SCR.2.15. The solvency capital requirement for each risk should be calculated both gross and net of the loss-absorbency of both technical provisions and security mechanisms.

SCR.2.16. The Basic Solvency Capital Requirement (*BSCR*) should be calculated by aggregating the gross capital requirements (for example Mkt_{int}) using the relevant correlation matrices.

SCR.2.17. The net Basic Solvency Capital Requirements with respect to technical provisions ($nBSCR_{TP}$) and security mechanism ($nBSCR_{SM}$) should be calculated by aggregating the net capital requirements (for example $nMkt_{int,TP}$; $nMkt_{int,SM}$) using again the relevant correlation matrices.

SCR.2.18. N.B.: for the purpose of this QIS, the quantities $nBSCR_{TP}$ and $nBSCR_{SM}$ will be estimated independently. However, this simplified approach may lead to an overestimation of the global adjustment for loss absorbing capacity of technical provisions and security mechanisms, which actually don't operate in an independent way.

SCR.2.19. The adjustment to BSCR for the loss-absorbing capacity of technical provisions should then be determined by comparing *BSCR* with $nBSCR_{TP}$. The absolute amount of the adjustment should not exceed the total value DCL of pure conditional, pure discretionary and mixed benefits and benefits subject to ex post reductions for the purpose of calculating the technical provisions:

$$Adj_{TP} = -\max(\min(BSCR - nBSCR_{TP}; DCL);0)$$

SCR.2.20. The adjustment to *BSCR* for the loss-absorbing capacity of security mechanisms should be determined by comparing *BSCR* with $nBSCR_{SM}$. The absolute amount of the adjustment should not exceed $MSS_{available}$ = maximum value of sponsor support (*MSS*) as determined according to section 2.6 – value of sponsor support already included in the holistic balance sheet plus $MPP_{available}$ = the maximum value of the pension protection scheme as determined according to section 2.6 – value of the pension protection scheme already included in the holistic balance sheet.

SCR.2.21. $Adj_{SM} = -\max(\min(BSCR - nBSCR_{SM}; MSS_{available} + MPP_{available});0)$

SCR.2.22. The adjustments for loss-absorbing capacity of technical provisions and security mechanisms under the modular approach should account for risk mitigating effects in relation the following risks:

- market risk

- pension liability risk

- counterparty default risk

SCR.2.23. The operational risk, the intangible asset risk and the health risk sub-modules do not contain specific scenarios. This makes it difficult to determine the loss-absorbing capacity of technical provisions and security mechanisms in these sub-modules.

SCR.2.24. To avoid this difficulty, the possible loss-absorbing effects of technical provisions and security mechanisms should be taken into account by reducing the combined SCR of these three sub-modules up to the difference between (DCL + MSS$_{available}$ + MPP$_{available}$) and (Adj$_{TP}$ + Adj$_{SM}$). If a reduction to zero of the SCR from all three sub-modules combined is not possible, then the available loss-absorbing effect (which is the difference described before) should be distributed to these sub-modules in an appropriate way.

SCR.2.25. Adj2 equals the sum of the adjustments made in these three submodules for the loss-absorbing capacity of technical provisions and security mechanisms.

SCR.2.26. If an IORP wishes to simplify the calculation for a sub-module – particularly in cases where the loss absorbing effect is not expected to be material – it may assume the calculation including the loss-absorbing effects of technical provisions is equal to the calculation excluding the loss-absorbing effects of technical provisions (i.e., it may put $nMkt_{int,TP} = Mkt_{int}$ and $nMkt_{int,SM} = Mkt_{int}$).

SCR.2.27. In case of the option "sponsor support as ancillary own funds", the value of sponsor support is not on the balance sheet. Therefore there is no loss absorbing capacity of sponsor support in this case. There is also no calculation of an SCR for possible losses in NAV due to negative impacts on sponsor support possible.

Adjustment for loss-absorbency of deferred taxes

SCR.2.28. The adjustment for the loss-absorbing capacity of deferred taxes should be equal to the change in the value of deferred taxes of IORPs that would result from an instantaneous loss of an amount that is equal to the following amount:

$SCRshock = BSCR + Adj1 + Adj2 + SCR_{Op}$

where *BSCR* is the Basic SCR, *Adj1*, *Adj2* are the adjustments for the loss-absorbing capacity of security mechanisms and technical provisions as defined above and SCR_{Op} denotes the capital requirement for operational risk.

SCR.2.29. For the purpose of this calculation, the value of deferred taxes should be calculated as set out in the section on valuation. Where a loss of *SCRshock* would result in the setting up of deferred tax assets IORPs should take into account the magnitude of the loss and its impact on the IORP's financial situation when assessing whether the realisation of that deferred tax asset is probable within a reasonable timeframe.

SCR.2.30. For the purpose of this calculation, a decrease in deferred tax liabilities or an increase in deferred tax assets should result in a negative adjustment for the loss-absorbing capacity of deferred taxes.

SCR.2.31. Where it is necessary to allocate the loss *SCRshock* to its causes in order to calculate the adjustment for the loss-absorbing capacity of deferred taxes, IORPs should allocate the loss to the risks that are captured by the Basic Solvency Capital Requirement and the capital requirement for operational risk. The allocation should be consistent with the contribution of the modules and sub-modules of the standard formula to the Basic SCR.

Option: exclude pure discretionary benefits

SCR.2.32. IORPs should evaluate the solvency capital requirement without including pure discretionary benefits.

Option: exclude pure discretionary and mixed benefits

SCR.2.33. IORPs should evaluate the solvency capital requirement without including pure discretionary and mixed benefits.

Option: exclude ex post benefits reductions

SCR.2.34. IORPs should evaluate the solvency capital requirement without including the possibility of reducing benefits ex post.

Option: exclude pension protection schemes

SCR.2.35. IORPs should evaluate the solvency capital requirement without including pension protection schemes.

3.3. SCR Operational risk

SCR.3.1   Operational risk is the risk of loss arising from inadequate or failed internal processes, or from personnel and systems, or from external events. Operational risk should include legal risks, and exclude risks arising from strategic decisions, as well as reputation risks. The operational risk module is designed to address operational risks to the extent that these have not been explicitly covered in other risk modules.

SCR.3.2   For the purpose of this section, reference to technical provisions is to be understood as technical provisions excluding the risk margin, to avoid circularity issues.

Input

SCR.3.3   The inputs for this module are:

$pEarn_{pension}$ = Contributions received during the 12 months prior to the previous 12 months for pension obligations, without deducting premium ceded to (re)insurance

$pEarn_{pension-ul}$ = Contributions received during the 12 months prior to the previous 12 months for pension obligations where the investment risk is borne by members and beneficiaries, without deducting premium ceded to (re)insurance

$Earn_{pension}$ = Contributions received during the previous 12 months for pension obligations, without deducting premium ceded to (re)insurance

$Earn_{pension-ul}$ = Contributions received during the previous 12 months for pension obligations where the investment risk is borne by members and beneficiaries without deducting premium ceded to (re)insurance

$TP_{pension}$ = Technical provisions for pension obligations. For the purpose of this calculation, technical provisions should not include the risk margin, should be without deduction of recoverables from (re)insurance contracts and special purpose vehicles

$TP_{pension-ul}$ = Technical provisions for pension obligations where the investment risk is borne by members and beneficiaries. For the purpose of this calculation, technical provisions should not include the risk margin, should be without deduction of recoverables from (re)insurance contracts and special purpose vehicles

Exp_{ul} = Amount of annual expenses incurred during the previous 12 months in respect of pension obligation where the

investment risk is borne by members and beneficiaries.

BSCR   =   Basic SCR

SCR.3.4   For the purpose of this QIS, technical provisions and expenses, as mentioned above, should include those referring to such benefits which are considered in the health risk sub-module.

<u>Output</u>

SCR.3.5   This module delivers the following output information:

SCR_{Op} =   Capital requirement for operational risk

<u>Calculation</u>

SCR.3.6   The capital requirement for operational risk is determined as follows:

$$SCR_{Op} = \min(0.3 \cdot BSCR; Op) + 0.25 \cdot Exp_{ul}$$

where

Op   =   Basic operational risk charge for all business other than such where the investment risk is borne by members and beneficiaries

is determined as follows:

$$Op = \max (Op_{premiums}; Op_{provisions})$$

where

$Op_{premiums} = 0.04 \cdot (Earn_{pension} - Earn_{pension\text{-}ul}) + \max(0; 0.04 \cdot (Earn_{pension} - 1.2 \cdot pEarn_{pension} - (Earn_{pension\text{-}ul} - 1.2 \cdot pEarn_{pension\text{-}ul})))$

and

$Op_{provisions} = 0.0045 \cdot \max (0; TP_{pension} - TP_{pension\text{-}ul})$

3.4. SCR Intangible asset risk module

<u>Description</u>

SCR.4.1   Where intangible assets are recognised according to the specifications set out in section 2.9, the risks inherent to these items should be considered in the calculation of the SCR.

SCR.4.2   Intangible assets are exposed to two risks:

- Market risks, as for other balance sheet items, derived from the decrease of prices in the active market, and also from unexpected lack of liquidity of the relevant active market, that may result in an additional impact on prices, even impeding any transaction.

- Internal risks, inherent to the specific nature of these elements (e.g. linked to either failures or unfavourable deviations in the process of finalization of the intangible asset, or any other features in such a manner that future benefits are no longer expected from the intangible asset or its amount is reduced; risks linked to the commercialization of the intangible asset, triggered by a deterioration of the public image of the IORP).

Input

SCR.4.3   The input for this module is:

IA =   value of intangible assets according to section 2.9

Output

SCR.4.4   The output for this module is the capital requirement for intangible assets, denoted as SCR$_{intangible}$.

Calculation

$SCR_{intangible} = 0.8 \cdot IA$

3.5. SCR market risk module

Introduction

Description

SCR.5.1.   Market risk arises from the level or volatility of market prices of financial instruments. Exposure to market risk is measured by the impact of movements in the level of financial variables such as stock prices, interest rates, real estate prices and exchange rates.

Input

SCR.5.2.   The following input information is required[7]:

Mkt_{int}^{Up}	=	Capital requirement for interest rate risk for the "up" shock
Mkt_{int}^{Down}	=	Capital requirement for interest rate risk for the "down" shock
Mkt_{int}	=	Capital requirement for interest rate risk
Mkt_{eq}	=	Capital requirement for equity risk
Mkt_{prop}	=	Capital requirement for property risk
Mkt_{sp}	=	Capital requirement for spread risk
Mkt_{conc}	=	Capital requirement for risk concentrations

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[7] Where for all subrisks the first eight capital requirements *Mkt* are not including the potential loss absorbing capacity of technical provisions and security mechanisms.

Mkt_{fx} = Capital requirement for currency risk

$nMkt_{int,TP}{}^{Up}$ = Capital requirement for interest rate risk for the "up" shock including the loss absorbing capacity of technical provisions

$nMkt_{int,TP}{}^{Down}$ = Capital requirement for interest rate risk for the "down" shock including the loss absorbing capacity of technical provisions

$nMkt_{int,TP}$ = Capital requirement for interest rate risk including the loss absorbing capacity of technical provisions

$nMkt_{prop,TP}$ = Capital requirement for property risk including the loss absorbing capacity of technical provisions

$nMkt_{sp,TP}$ = Capital requirement for spread risk including the loss-absorbing capacity of technical provisions

$nMkt_{conc,TP}$ = Capital requirement for concentration risk including the loss-absorbing capacity of technical provisions

$nMkt_{fx,TP}$ = Capital requirement for currency risk including the loss-absorbing capacity of technical provisions

$nMkt_{eq,TP}$ = Capital requirement for equity risk including the loss-absorbing capacity of technical provisions

$nMkt_{int,SM}{}^{Up}$ = Capital requirement for interest rate risk for the "up" shock including the loss absorbing capacity of security mechanisms

$nMkt_{int,SM}{}^{Down}$ = Capital requirement for interest rate risk for the "down" shock including the loss absorbing capacity of security mechanisms

$nMkt_{int,SM}$ = Capital requirement for interest rate risk including the loss absorbing capacity of security mechanisms

$nMkt_{prop,SM}$ = Capital requirement for property risk including the loss absorbing capacity of security mechanisms

$nMkt_{sp,SM}$ = Capital requirement for spread risk including the loss-absorbing capacity of security mechanisms

$nMkt_{conc,SM}$ = Capital requirement for concentration risk including the loss-absorbing capacity of security mechanisms

$nMkt_{fx,SM}$ = Capital requirement for currency risk including the loss-absorbing capacity of security mechanisms

$nMkt_{eq,SM}$ = Capital requirement for equity risk including the loss-absorbing capacity of security mechanisms

Output

SCR.5.3.   The module delivers the following output:

SCR_{mkt} =   Capital requirement for market risk

$nSCR_{mkt,\ TP}$ =   Capital requirement for market risk including the loss-absorbing capacity of technical provisions

$nSCR_{mkt,\ SM}$ =   Capital requirement for market risk including the loss-absorbing capacity of security mechanisms

Calculation

SCR.5.4.   The market sub-risks should be combined to an overall capital requirement SCR_{mkt} for market risk using a correlation matrix as follows:

$$\mathrm{SCR}_{\mathrm{mkt}} = \sqrt{\sum_{ij} CorrMkt_{ij} \times Mkt_i \times Mkt_j}$$

where

$CorrMkt_{ij}$ =   The respective entries of the correlation matrix $CorrMkt$

$Mkt_i,\ Mkt_j$ =   Capital requirements for sub-modules i and j respectively of the market risk module

and the correlation matrix CorrMkt defined as:

CorrMkt	Interest	Equity	Property	Spread	Currency	Concen-tration
Interest	1					
Equity	A	1				
Property	A	0.75	1			
Spread	A	0.75	0.5	1		
Currency	0.25	0.25	0.25	0.25	1	
Concentration	0	0	0	0	0	1

SCR.5.5.   The parameter A shall be equal to 0 when the capital requirement for interest rate risk as determined below is derived from the capital requirement for the risk of an increase in the interest rate term structure including the loss absorbing capacity of technical provisions. Otherwise the parameter A shall be equal to 0.5.

SCR.5.6.   The capital requirement for $nSCR_{mkt,\ TP}$ is determined as follows:

$$\text{nSCR}_{\text{mkt, TP}} = \sqrt{\sum_{ij} CorrMkt_{ij} \times nMkt_{i,TP} \times nMkt_{j,TP}}$$

SCR.5.7.   The capital requirement for $nSCR_{mkt,\ SM}$ is determined as follows:

$$\text{nSCR}_{\text{mkt, SM}} = \sqrt{\sum_{ij} CorrMkt_{ij} \times nMkt_{i,SM} \times nMkt_{j,SM}}$$

Scenario-based calculations

SCR.5.8.   The calculations of capital requirements in the market risk module are based on specified scenarios. General guidance about the interpretation of the scenarios can be found in section 3.1.

Look-through approach

SCR.5.9.   In order to properly assess the market risk inherent in collective investment funds, it will be necessary to examine their economic substance. Wherever possible, this should be achieved by applying a look-through approach in order to assess the risks applying to the assets underlying the investment vehicle. Each of the underlying assets would then be subjected to the relevant sub-modules.

SCR.5.10.   The same look-through approach should also be applied for other indirect exposures.

SCR.5.11.   Where a number of iterations of the look-through approach is required (e.g. where an investment fund is invested in other investment funds), the number of iterations should be sufficient to ensure that all material market risk is captured.

SCR.5.12.   The above recommendations should be applied to both passively and actively managed funds.

SCR.5.13.   Where a collective investment scheme is not sufficiently transparent to allow a reasonable allocation of the investments, reference should be made to the investment mandate of the scheme. It should be assumed that the scheme invests in accordance with its mandate in such a manner as to produce the maximum overall capital requirement. For example, it should be assumed that the scheme invests assets in each rating category, starting at the lowest category permitted by the mandate, to the maximum extent. If a scheme may invest in a range of assets exposed to the risks assessed under this module, then it should be assumed that the proportion of assets in each exposure category is such that the overall capital requirement is maximised.

SCR.5.14.   As a third choice to the look-through and mandate-based methods, IORPs should consider the collective investment scheme as an equity investment and apply the global equity risk stress (if the assets within the collective investment scheme are only listed in the EEA or OECD) or other equity stress (otherwise).

Mkt$_{int}$ interest rate risk

<u>Description</u>

SCR.5.15. Interest rate risk exists for all assets and liabilities for which the net asset value is sensitive to changes in the term structure of interest rates or interest rate volatility. This applies to both real and nominal term structures.

SCR.5.16. Assets sensitive to interest rate movements will include fixed-income investments, financing instruments (for example loan capital), policy loans, interest rate derivatives and any insurance assets.

SCR.5.17. The discounted value of future cash-flows, in particular in the valuation of technical provisions, will be sensitive to a change in the rate at which those cash-flows are discounted.

<u>Input</u>

SCR.5.18. The following input information is required:

$$NAV \quad = \quad \text{Net value of assets minus liabilities}$$

<u>Output</u>

SCR.5.19. The module delivers the following output:

Mkt_{int}^{Up} = Capital requirement for interest rate risk after upward shocks

Mkt_{int}^{Down} = Capital requirement for interest rate risk after downward shocks

Mkt_{int} = Capital requirement for interest rate risk

$nMkt_{int,TP}^{Up}$ = Capital requirement for interest rate risk after upward shock including the loss absorbing capacity of technical provisions

$nMkt_{int,TP}^{Down}$ = Capital requirement for interest rate risk after downward shock including the loss absorbing capacity of technical provisions

$nMkt_{int,SM}^{Up}$ = Capital requirement for interest rate risk after upward shock including the loss absorbing capacity of security mechanisms

$nMkt_{int,SM}^{Down}$ = Capital requirement for interest rate risk after downward shock including the loss absorbing capacity of security mechanisms

<u>Calculation</u>

SCR.5.20. The capital requirement for interest rate risk is determined as the result of two pre-defined scenarios:

$Mkt_{int}^{Up} = \Delta NAV|_{up}$

$Mkt_{int}^{Down} = \Delta NAV|_{down}$

where $\Delta NAV|_{up}$ and $\Delta NAV|_{down}$ are the changes in the net value of asset and liabilities due to re-valuing all interest rate sensitive items using altered term structures upward and downward. The stress causing the revaluations is instantaneous.

SCR.5.21. Where an IORP is exposed to interest rate movements in more than one currency, the capital requirement for interest rate risk should be calculated based on the combined relative change on all relevant yield curves.

SCR.5.22. The altered term structures are derived by multiplying the current interest rate curve by $(1+s^{up})$ and $(1+s^{down})$, where both the upward stress $s^{up}(t)$ and the downward stress $s^{down}(t)$ for individual maturities t are specified as follows:

Maturity t (years)	relative change $s^{up}(t)$	relative change $s^{down}(t)$
0.25	70%	-75%
0.5	70%	-75%
1	70%	-75%
2	70%	-65%
3	64%	-56%
4	59%	-50%
5	55%	-46%
6	52%	-42%
7	49%	-39%
8	47%	-36%
9	44%	-33%
10	42%	-31%
11	39%	-30%
12	37%	-29%
13	35%	-28%
14	34%	-28%
15	33%	-27%
16	31%	-28%
17	30%	-28%
18	29%	-28%
19	27%	-29%
20	26%	-29%
90	20%	-20%

For example, the "stressed" 15-year interest rate $R_1(15)$ in the upward stress scenario is determined as

$$R_1(15) = R_0(15) \bullet (1 + 0.33)$$

where $R_0(15)$ is the 15-year interest rate based on the current term structure.

For maturities not specified in the table above, the value of the relative changes shall be linearly interpolated. For all maturities shorter than 1 year,

the relative changes shall be equal to the relative change for the maturity of 1 year. For maturities longer than 90 years the relative change shall be 20 % or -20 % respectively.

SCR.5.23. Irrespective of the above stress factors, the absolute change of interest rates should at least be one percentage point. Where the unstressed rate is lower than 1%, the shocked rate in the downward scenario should be assumed to be 0%.

SCR.5.24. The interest rate scenarios should be calculated under the condition that the scenario does not change the value of technical provisions and security mechanisms as a consequence of their loss-absorbing capacity.

SCR.5.25. Additionally, the result of the scenarios should be determined under the condition that the value of technical provisions and security mechanisms can change in response to the shock being tested.

SCR.5.26. The capital requirement for interest rate risk is derived from the type of shock that gives rise to the highest capital requirement including the loss absorbing capacity of technical provisions and security mechanisms:

If $(nMkt_{int,TP}{}^{Up} + nMkt_{int,SM}{}^{Up}) > (nMkt_{int,TP}{}^{Down} + nMkt_{int,SM}{}^{Down})$ then $nMkt_{int,TP} = \max(nMkt_{int,TP}{}^{Up},0)$, $nMkt_{int,SM} = \max(nMkt_{int,SM}{}^{Up},0)$ and $Mkt_{int} = \max(Mkt_{int}{}^{Up},0)$.

If $(nMkt_{int,TP}{}^{Up} + nMkt_{int,SM}{}^{Up}) \leq (nMkt_{int,TP}{}^{Down} + nMkt_{int,SM}{}^{Down})$ then $nMkt_{int,TP} = \max(nMkt_{int,TP}{}^{Down},0)$, $nMkt_{int,SM} = \max(nMkt_{int,SM}{}^{Down},0)$ and $Mkt_{int} = \max(Mkt_{int}{}^{Down},0)$..

SCR.5.27. Where data regarding maturities is not available to a suffecent degree, an approximation based on average (or typical) durations should be made. The basis for the approximations used should be made clear.

Mkt$_{eq}$ equity risk

Description

SCR.5.28. Equity risk arises from the level or volatility of market prices for equities. Exposure to equity risk refers to all assets and liabilities whose value is sensitive to changes in equity prices.

SCR.5.29. For the calculation of the equity risk capital requirement, hedging and risk transfer mechanisms should be taken into account according to the principles of section 3.9. However, as a general rule, hedging instruments should only be allowed with the average protection level over the next year unless they are part of a rolling hedging program that meets the requirements set out in SCR.9.16 ff. For example, where an equity option not part of such a rolling hedge program provides protection for the next six months, as a simplification, IORPs should assume that the option only covers half of the current exposure.

Input

SCR.5.30. The following input information is required:

$NAV =$ The net value of assets minus liabilities

Output

SCR.5.31. The module delivers the following output:

Mkt_{eq} =   Capital requirement for equity risk

$nMkt_{eq, TP}$ =   Capital requirement for equity risk including the loss absorbing capacity of technical provisions

$nMkt_{eq, SM}$ =   Capital requirement for equity risk including the loss absorbing capacity of security mechanisms

<u>Calculation</u>

SCR.5.32. IORPs should calculate the capital requirement for equity risk using the "symmetric adjustment" or - in other words - "equity dampener".

SCR.5.33. For the determination of the capital requirement for equity risk, the following split is considered: equities listed in regulated markets in the countries which are members of the EEA or the OECD ("Global equity" category), and other equities ("Other equity" category). "Other" comprises equity listed only in emerging markets, non-listed equity, hedge funds and any other investments not included elsewhere in the market risk module.

SCR.5.34. The calculation is carried out as follows:

SCR.5.35. In a first step, for each category i a capital requirement is determined as the result of a pre-defined stress scenario for category i as follows:

$$Mkt_{eq,i} = \max(\Delta NAV \mid equity\ shock_i; 0)$$

where

$equity\ shock_i$ =   Prescribed fall in the value of equities in the category i

$Mkt_{eq,i}$ =   Capital requirement for equity risk with respect to category i,

and where the equity shock scenarios for the individual categories are specified as follows:

	Global	Other
equity shock$_i$	30%	40%

SCR.5.36. Note that the stresses above take account of a "symmetric adjustment" of **-9%**. The base levels of the two stresses are **39%** and **49%**.

Remark: The "symmetric adjustment" will be updated to reflect the latest calculation method and the base year of end 2011.

SCR.5.37. The capital requirement Mkt$_{eq,i}$ is determined as the immediate effect on the net value of assets and liabilities expected in the event of an immediate decrease of *equity shock$_i$* in value of equities belonging to category i taking account of all the participant's individual direct and indirect exposures to equity prices.

SCR.5.38. For the determination of this capital requirement, all equities and equity type exposures have to be taken into account, including private equity as well as certain types of alternative investments.

SCR.5.39. Alternative investments should cover all types of equity type risk like hedge funds, derivatives, managed futures, investments in SPVs etc., which cannot be allocated to spread risk or classical equity type risk, either directly, or through a look through test.

SCR.5.40. The equity exposure of mutual funds should be allocated on a "look-through" basis as specified for collective investments funds in SCR.5.9 ff.

SCR.5.41. In a second step, the capital requirement for equity risk is derived by combining the capital requirements for the individual categories using a correlation matrix as follows:

$$MKT_{eq} = \sqrt{\sum_{rxc} CorrIndex^{rxc} \cdot Mkt_r \cdot Mkt_c}$$

where

$CorrIndex^{rxc}$	=	The entries of the correlation matrix $CorrIndex$
Mkt_r, Mkt_c	=	Capital requirements for equity risk per individual category according to the rows and columns of correlation matrix $CorrIndex$

and where the correlation matrix $CorrIndex$ is defined as:

CorrIndex	Global	Other
Global	1	
Other	0.75	1

SCR.5.42. The equity scenarios should be calculated under the condition that the scenario does not change the value of technical provisions and security mechanisms as a consequence of their loss-absorbing capacity.

SCR.5.43. Additionally, the result of the scenarios should be determined under the condition that the value of technical provisions and security mechanisms can change in response to the shock being tested. The resulting capital requirements are $nMkt_{eq,TP}$ and $nMkt_{eq,SM}$.

Option: exclude equity dampener / symmetric adjustment

SCR.5.44. The calculation should be done as above, but without the "symmetric adjustment".

SCR.5.45. This means that shocks of 39 % and 49 % respectively are to be applied.

Option: duration-based approach

SCR.5.46. For all IORPs where the average duration of the liabilities exceeds 12 years the equity risk capital requirement Mkt_{eq} is calculated as described above, but based on an equity stress of 22% on all equities.

SCR.5.47. For IORPs where the average duration of the liabilities does not exceed 12 years no calculation is required.

Mkt_{prop} property risk

Description

SCR.5.48. Property risk arises as a result of sensitivity of the value of assets, liabilities and financial investments to the level or volatility of market prices of property.

SCR.5.49. The following investments should be treated as property and their risks considered accordingly in the property risk sub-module:

- land, buildings and immovable-property rights;
- direct or indirect participations in real estate companies that generate periodic income or which are otherwise intended for investment purposes;
- property investment for the own use of the IORP.

SCR.5.50. Otherwise, the following investments should be treated as equity and their risks considered accordingly in the equity risk sub-module:

- an investment in a company engaged in real estate management, or
- an investment in a company engaged in real estate project development or similar activities, or
- an investment in a company which took out loans from institutions other than the IORP itself in order to leverage its investments in properties.

SCR.5.51. Collective real estate investment vehicles should be treated like other collective investment vehicles with a look-through approach.

Input

SCR.5.52. The following input information is required:

NAV = Net value of assets minus liabilities

Output

SCR.5.53. The module delivers the following output:

Mkt_{prop} = Capital requirement for property risk[8]

$nMkt_{prop,\,TP}$ = Capital requirement for property risk including the loss absorbing capacity of technical provisions

$nMkt_{prop,\,SM}$ = Capital requirement for property risk including the loss absorbing capacity of security mechanisms

Calculation

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[8] Not including the potential loss absorbing capacity of technical provisions.

SCR.5.54. The capital requirement for property risk is determined as the result of a pre-defined scenario:

$$Mkt_{prop} = \max(\Delta NAV \mid property\ shock; 0)$$

SCR.5.55. The property shock is the immediate effect on the net value of asset and liabilities expected in the event of an instantaneous decrease of 25 % in the value of investments in real estate, taking account of all the participant's individual direct and indirect exposures to property prices. The property shock takes account of the specific investment policy including e.g. hedging arrangements, gearing etc.

SCR.5.56. The property scenario should be calculated under the condition that the scenario does not change the value of technical provisions and security mechanisms as a consequence of their loss-absorbing capacity.

SCR.5.57. Additionally, the result of the scenario should be determined under the condition that the value of technical provisions and security mechanisms can change in response to the shock being tested. The resulting capital requirements are $nMkt_{prop,TP}$ and $nMkt_{prop,SM}$.

Mkt$_{fx}$ currency risk

Description

SCR.5.58. Currency risk arises from changes in the level or volatility of currency exchange rates.

SCR.5.59. IORPs may be exposed to currency risk arising from various sources, including their investment portfolios, as well as assets, liabilities and investments in related undertakings. The design of the currency risk sub-module is intended to take into account currency risk for an IORP arising from all possible sources.

SCR.5.60. The *local currency* is the currency in which the IORP prepares its financial statements. All other currencies are referred to as *foreign currencies*. A foreign currency is *relevant* for the scenario calculations if the amount of basic own funds depends on the exchange rate between the foreign currency and the local currency.

SCR.5.61. Note that for each relevant foreign currency C, the currency position should include any investment in foreign instruments where the currency risk is not hedged. This is because the stresses for interest rate, equity, spread and property risks have not been designed to incorporate currency risk.

SCR.5.62. Investments in listed equity should be assumed to be sensitive to the currency of its main listing. Non-listed equity and property should be assumed to be sensitive to the currency of the country where it is located or the currency of the country where the issuer of the equity has its main operation, respectively.

Input

SCR.5.63. The following input information is required:

$$NAV \quad = \quad \text{Net value of assets minus liabilities}$$

Output

SCR.5.64. The module delivers the following output:

Mkt_{fx}	=	Capital requirement for currency risk
Mkt_{fx}^{Up}	=	Capital requirement for currency risk after an upward shock
Mkt_{fx}^{Down}	=	Capital requirement for currency risk after a downward shock
$nMkt_{fx,\,TP}$	=	Capital requirement for currency risk including the loss absorbing capacity of technical provisions
$nMkt_{fx,\,TP}^{Up}$	=	Capital requirement for currency risk after an upward shock including the loss absorbing capacity of technical provisions
$nMkt_{fx,\,TP}^{Down}$	=	Capital requirement for currency risk after a downward shock including the loss absorbing capacity of technical provisions
$nMkt_{fx,\,SM}$	=	Capital requirement for currency risk including the loss absorbing capacity of security mechanisms
$nMkt_{fx,SM}^{Up}$	=	Capital requirement for currency risk after an upward shock including the loss absorbing capacity of security mechanisms
$nMkt_{fx,\,SM}^{Down}$	=	Capital requirement for currency risk after a downward shock including the loss absorbing capacity of security mechanisms

Calculation

SCR.5.65. The capital requirement for currency risk is determined as the result of two pre-defined scenarios:

$$Mkt_{fx,C}^{Up} = \max(\Delta NAV \mid fxupward\ shock; 0)$$

$$Mkt_{fx,C}^{Down} = \max(\Delta NAV \mid fxdownward\ shock; 0)$$

SCR.5.66. The scenario *fxupward shock* is an instantaneous rise in the value of 25% of the currency C against the local currency. The scenario *fxdownward shock* is an instantaneous fall of 25% in the value of the currency C against the local currency.

SCR.5.67. All of the participant's individual currency positions and its investment policy (e.g. hedging arrangements, gearing etc.) should be taken into account.

SCR.5.68. The currency scenarios should be calculated under the condition that the scenario does not change the value of technical provisions and security mechanisms as a consequence of their loss-absorbing capacity.

SCR.5.69. Additionally, the result of the scenarios should be determined under the condition that the value of technical provisions and security mechanisms can change in response to the shock being tested. The resulting capital requirements are $nMkt_{fx,C,TP}^{Up}$, $nMkt_{fx,C,TP}^{Down}$, $nMkt_{fx,C,SM}^{Up}$ and $nMkt_{fx,C,SM}^{Down}$.

SCR.5.70. For each currency, the capital requirement for foreign exchange risk is derived from the type of shock that gives rise to the highest capital requirement including the loss absorbing capacity of technical provisions and security mechanisms: $nMkt_{fx,C}$ should be determined as the maximum of the values $nMkt_{fx,C}^{Up}$ and $nMkt_{fx,C}^{Down}$.

If $(nMkt_{fx,C,TP}^{Up} + nMkt_{fx,C,SM}^{Up}) > (nMkt_{fx,C,TP}^{Down} + nMkt_{fx,C,SM}^{Down})$ then $nMkt_{fx,C,TP} = \max(nMkt_{fx,C,TP}^{Up},0)$ and $nMkt_{fx,C,SM} = \max(nMkt_{fx,C,SM}^{Up},0)$.

If $(nMkt_{fx,C,TP}^{Up} + nMkt_{fx,C,SM}^{Up}) \leq (nMkt_{fx,C,TP}^{Down} + nMkt_{fx,C,SM}^{Down})$ then $nMkt_{fx,C,TP} = \max(nMkt_{fx,C,TP}^{Down},0)$ and $nMkt_{fx,C,SM} = \max(nMkt_{fx,C,SM}^{Down},0)$.

SCR.5.71. The total capital requirements $nMkt_{fx,TP}$ and $nMkt_{fx,SM}$ will be the sum over all currencies of $nMkt_{fx,C,TP}$ and $nMkt_{fx,C,SM}$, respectively.

SCR.5.72. For each currency, $Mkt_{fx,C}$ should be equal to $Mkt_{fx,C}^{Up}$, if $nMkt_{fx,C,TP} = nMkt_{fx,C,TP}^{Up}$ (or $nMkt_{fx,C,SM} = nMkt_{fx,C,SM}^{Up}$) and otherwise equal to $Mkt_{fx,C}^{Down}$. The total capital requirement Mkt_{fx} will be the sum over all currencies of $Mkt_{fx,C}$.

Mkt_{sp} spread risk

Remark: The specifications for this sub-module will be updated during the course of the consultation to reflect a reduction of capital requirements for long-term bonds. The Commission has asked EIOPA to also keep the specifications provided in this version of the draft technical specification as an option.

Description

SCR.5.73. Spread risk results from the sensitivity of the value of assets, liabilities and financial instruments to changes in the level or in the volatility of credit spreads over the risk-free interest rate term structure.

SCR.5.74. The spread risk module applies in particular to the following classes of bonds:

• Investment grade corporate bonds

• High yields corporate bonds

• Subordinated debt

• Hybrid debt.

SCR.5.75. Furthermore, the spread risk module is applicable to all types of asset-backed securities as well as to all the tranches of structured credit products such collateralised debt obligations. This class of securities

includes transactions of schemes whereby the credit risk associated with an exposure or pool of exposures is tranched, having the following characteristics:

- payments in the transaction or scheme are dependent upon the performance of the exposure or pool of exposures; and

- the subordination of tranches determines the distribution of losses during the ongoing life of the transaction or scheme.

SCR.5.76. For collateralised debt obligations it will be important to take into account the nature of the risks associated with the collateral assets. For example, in the case of a CDO-squared, the rating should take into account the risks associated with the CDO tranches held as collateral, i.e. the extent of their leveraging and the risks associated with the collateral assets of these CDO tranches

SCR.5.77. The spread risk sub-module will further cover in particular credit derivatives, for example (but not limited to) credit default swaps, total return swaps and credit linked notes that are not held as part of a recognised risk mitigation policy.

SCR.5.78. In relation to credit derivatives, only the credit risk which is transferred by the derivative is covered in the spread risk sub-module.

SCR.5.79. Instruments sensitive to changes in credit spreads may also give rise to other risks, which should be treated accordingly in the appropriate modules. For example, the counterparty default risk associated with the counterparty of a risk-mitigating transaction should be addressed in the counterparty default risk module, rather than in the spread risk sub-module.

SCR.5.80. The spread risk sub-module also covers the credit risk of other credit risky investments including in particular:

- participating interests

- debt securities issued by, and loans to, affiliated undertakings and undertakings with which an IORP is linked by virtue of a participating interest

- debt securities and other fixed-income securities

- participation in investment pools

- deposits with credit institutions

SCR.5.81. The design for the sub-module implies that credit spread risk hedging programmes can still be taken into account when calculating the capital requirement for this risk type. This enables IORPs to gain appropriate recognition of, and allowance for, their hedging instruments – subject to proper treatment of the risks inherent in the hedging programmes.

Input

SCR.5.82. The following input information is required:

MV_i = the value of the credit risk exposure i

		according to subsection V.1
rating$_i$	=	for corporate bonds, the external rating of credit risk exposure i
duration$_i$	=	for corporate bonds, the duration of credit risk exposure i
attach$_i$	=	for structured credit products, the attachment point of the tranche held
detach$_i$	=	for structured credit products, the detachment point of the tranche held
tenure$_i$	=	for structured credit products, the average tenure of the assets securitised
ratingdist$_i$	=	for structured credit products, a vector of the rating distribution in the asset pool securitised

SCR.5.83. In cases where several ratings are available for a given credit exposure, the second-best rating should be applied.

Output

SCR.5.84. The module delivers the following output:

Mkt$_{sp}$	=	Capital requirement for spread risk
nMkt$_{sp, TP}$	=	Capital requirement for spread risk including the loss absorbing capacity of technical provisions
nMkt$_{sp, SM}$	=	Capital requirement for spread risk including the loss absorbing capacity of security mechanisms

Calculation

SCR.5.85. The capital requirement for spread risk is determined as follows:

$$Mkt_{sp} = Mkt_{sp}^{\ bonds} + Mkt_{sp}^{\ struct} + Mkt_{sp}^{\ cd}$$

where:

Mkt$_{sp}^{bonds}$	=	the capital requirement for spread risk of bonds
Mkt$_{sp}^{struct}$	=	the capital requirement for spread risk of structured credit products
Mkt$_{sp}^{cd}$	=	the capital requirement for credit derivatives

Spread risk on bonds

SCR.5.86. The capital requirement for spread risk of bonds is determined as the result of a pre-defined scenario :

$$Mkt_{sp}^{bonds} = \max(\Delta NAV \mid spread\ shock\ on\ bonds;0)$$

SCR.5.87. The spread risk shock on bonds is the immediate effect on the net value of asset and liabilities expected in the event of an instantaneous decrease of values in bonds due to the widening of their credit spreads:

$$\sum_i MV_i \cdot duration_i \cdot F^{up}(rating_i)$$
where:

$F^{up}(rating_i)$ =   a function of the rating class of the credit risk exposure which is calibrated to deliver a shock consistent with VaR 99.5% following a widening of credit spreads

SCR.5.88. To determine the spread risk capital requirement for bonds, the following factors F^{up} should be used:

Spread risk factors for bonds

	F^{up}	Duration Floor	Duration Cap
AAA	0,9%	1	36
AA	1,1%	1	29
A	1,4%	1	23
BBB	2,5%	1	13
BB	4,5%	1	10
B or lower	7,5%	1	8
Unrated	3,0%	1	12

SCR.5.89. The factors F^{up} are applied to assess the impact of a widening of spreads on the value of bonds. For example, for a AAA-rated bond with a duration of 5 years a loss in value of 4.5% would be assumed under the widening of spreads scenario.

SCR.5.90. The shock factors of function F^{up} will be multiplied with the modified duration of a bond. For variable interest rate bonds, the modified duration used in the calculation should be equivalent to a fixed income bond with coupon payments equal to the forward interest rate.

SCR.5.91. For unrated bonds, the issuer rating could be used as a proxy if the unrated bond does not inhibit any specificities which detriment credit quality, e.g. subordination.

Special reference to mortgage covered bonds and public sector covered bonds

SCR.5.92. In order to provide mortgage covered bonds and public sector covered bonds with a treatment in spread risk sub-module according to their specific risk features, the risk factor F^{up} applicable should be 0,6% and the duration cap should be 53 years when all the following requirements are met:

- the asset has a AAA credit quality

- the covered bond meets the requirements defined in Article 22(4) of the UCITS directive 85/611/EEC

Special reference to exposures to governments, central banks, multilateral development banks and international organisations

SCR.5.93. No capital requirement should apply for the purposes of this sub-module to borrowings by or demonstrably guaranteed by national government of an EEA state, issued in the currency of the government, or issued by a multilateral development bank as listed in Annex VI, Part 1, Number 4 of the Capital Requirements Directive (2006/48/EC) or issued by an international organisation listed in Annex VI, Part 1, Number 5 of the Capital Requirements Directive (2006/48/EC) or issued by the European Central Bank.

SCR.5.94. To determine the spread risk capital requirement for exposures to governments or central banks denominated and funded in the domestic currency, other than those mentioned in the previous paragraph, the following factors F^{up} should be used:

Spread risk factors for exposures to non-EEA governments and central banks denominated and funded in the domestic currency

	F^{up}	Duration Floor	Duration Cap
AAA	0%	--	--
AA	0%	--	--
A	1,1%	1	29
BBB	1,4%	1	23
BB	2,5%	1	13
B or lower	4,5%	1	10
Unrated	3,0%	1	12

SCR.5.95. In order to allow an analysis of the impact of these provisions, IORPs should disclose their exposures to government and central banks.

Spread risk on structured products

SCR.5.96. The capital requirement for spread risk of structured credit products is determined as the result of two pre-defined scenarios:

$$Mkt_{sp,underlying}^{struct} = \max(\Delta NAV \mid spread\ shock\ on\ underlying\ assets\ of\ structured\ products;0)$$

$$Mkt_{sp,direct}^{struct} = \max(\Delta NAV \mid directspread\ shock\ on\ structured\ products;0)$$

SCR.5.97. The spread shock on underlying assets of structured products is the immediate effect on the net asset value expected in the event of the following instantaneous decrease of values in structured products due to the widening of the credit spreads of bonds of the underlying assets:

$$\sum_i MV_i \frac{(G(ratingdist_i,tenure_i) - attach_i)}{detach_i - attach_i}$$

where

$G(ratingdist_i,tenure_i)$ = a function of the rating class and tenure of the credit risk exposure within a securitised asset pool which is calibrated to deliver a shock consistent with VaR 99.5%

SCR.5.98. The function G is determined as follows:

$G(ratingdist_i, tenure_i)$	AAA	AA	A	BBB	BB	B	CCC or lower	Unrated
[0-2 years[	0.4%	0.9%	2.8%	5.3%	14.6%	31.1%	52.7%	6.3%
[2-4 years[	0.8%	1.7%	4.9%	9.6%	23.9%	44.8%	66.6%	11.4%
[4-6 years[	1.2%	2.8%	6.5%	13.1%	30.1%	51.2%	70.7%	15.7%
[6-8 years[	1.8%	4.1%	8.4%	16.4%	35.3%	55.0%	72.6%	19.6%
8+ years	2.4%	5.3%	10.3%	19.6%	39.3%	57.8%	73.5%	23.5%

SCR.5.99. The direct spread shock on structured products is the immediate effect on the net asset value expected in the event of the following instantaneous decrease of values in structured products due to the widening of their credit spreads:

$$\sum_i MV_i \bullet duration_i \bullet F^{'up}(rating_i)$$

where:

$F^{\wedge up}(rating_i)$ = a function of the rating class of the credit risk exposure which is calibrated to deliver a shock consistent with VaR 99.5% following a widening of credit spreads

SCR.5.100. To determine the spread risk capital requirement for structured products, the following factors F'^{up} should be used:

Spread risk factors for structured products (direct spread shock)

	F'^{up}	Duration Floor	Duration Cap
AAA	0,9%	1	36
AA	1,1%	1	29
A	1,4%	1	23
BBB	2,5%	1	13
BB	6,75%	1	10
B or lower	11,25%	1	8
Unrated	3,0%	1	12

SCR.5.101. The factors F'^{up} are applied to assess the impact of a widening of spreads on the value of structured products. For example, for a AAA-rated structured product with a duration of 5 years a loss in value of 4.5% would be assumed under the widening of spreads scenario.

SCR.5.102. The capital requirement for spread risk on structured products is derived from the type of shock that gives rise to the highest capital requirement including the loss absorbing capacity of technical provisions and security mechanisms:

If $(nMkt_{sp,underlying,TP}^{struct} + nMkt_{sp,underlying,SM}^{struct}) > (nMkt_{sp,direct,TP}^{struct} + nMkt_{sp,direct,SM}^{struct})$ then

$Mkt_{sp}^{struct} = Mkt_{sp,underlying}^{struct}$, $nMkt_{sp,TP}^{struct} = nMkt_{sp,underlying,TP}^{struct}$ and $nMkt_{sp,SM}^{struct} = nMkt_{sp,underlying,SM}^{struct}$.

If $(nMkt_{sp,underlying,TP}^{struct} + nMkt_{sp,underlying,SM}^{struct}) \leq (nMkt_{sp,direct,TP}^{struct} + nMkt_{sp,direct,SM}^{struct})$ then

$Mkt_{sp}^{struct} = Mkt_{sp,direct}^{struct}$, $nMkt_{sp,TP}^{struct} = nMkt_{sp,direct,TP}^{struct}$ and $nMkt_{sp,SM}^{struct} = nMkt_{sp,direct,SM}^{struct}$.

Spread risk on credit derivatives

SCR.5.103. For credit derivatives a scenario-based approach is followed. Credit derivatives encompass credit default swaps (CDS), total return swaps (TRS), and credit linked notes (CLN), where:

- the IORP does not hold the underlying instrument or another exposure where the basis risk between that exposure and the underlying instrument is immaterial in all possible scenarios; or

- the credit derivative is not part of the IORP's risk mitigation policy.

SCR.5.104. The capital requirement for spread risk of credit derivatives is determined as the result of two pre-defined scenario :

$Mkt_{sp,upward}^{cd} = \max(\Delta NAV \mid upward\ spread\ shock\ on\ credit\ derivatives;0)$

$$Mkt_{sp,downward}^{cd} = \max(\Delta NAV \mid downward\ spread\ shock\ on\ credit\ derivatives;0)$$

SCR.5.105. The upward (respectively downward) spread risk shock on credit derivatives is the immediate effect on the net value of asset and liabilities, after netting with offsetting corporate bond exposures, expected in the event of an instantaneous widening (respectively decrease) of the credit spreads of credit derivatives of the following magnitude:

Spread risk factors for credit derivatives

	Widening of the spreads (in absolute terms)	Decrease of the spreads (in relative terms)
AAA	+130 bp	**-75%**
AA	+150 bp	**-75%**
A	+260 bp	**-75%**
BBB	+450 bp	**-75%**
BB	+840 bp	**-75%**
B or lower	+1620 bp	**-75%**
Unrated	+500 bp	**-75%**

SCR.5.106. The capital requirement for spread risk on credit derivatives derived from the type of shock that gives rise to the highest capital requirement including the loss absorbing capacity of technical provisions and security mechanisms:

If $(nMkt_{sp,upward,TP}^{cd} + nMkt_{sp,upward,SM}^{cd}) > (nMkt_{sp,downward,TP}^{cd} + nMkt_{sp,downward,SM}^{cd})$ then

$Mkt_{sp}^{cd} = Mkt_{sp,upward}^{cd}$, $nMkt_{sp,TP}^{cd} = nMkt_{sp,upward,TP}^{cd}$ and $nMkt_{sp,SM}^{cd} = nMkt_{sp,upward,SM}^{cd}$.

If $(nMkt_{sp,upward,TP}^{cd} + nMkt_{sp,upward,SM}^{cd}) \leq (nMkt_{sp,downward,TP}^{cd} + nMkt_{sp,downward,SM}^{cd})$ then

$Mkt_{sp}^{cd} = Mkt_{sp,downward}^{cd}$, $nMkt_{sp,TP}^{cd} = nMkt_{sp,downward,TP}^{cd}$ and $nMkt_{sp,SM}^{cd} = nMkt_{sp,downward,SM}^{cd}$.

Simplified calculations for the spread risk on bonds

SCR.5.107. The following simplification may be used provided that it is proportionate to the nature, scale and complexity of the risks that the IORP faces.

SCR.5.108. The simplification is defined as follows:

$$Mkt_{sp}^{bonds} = MV^{bonds} \cdot \sum_i \%MV_i^{bonds} \bullet F^{up}(rating_i) \bullet duration_i + \Delta Liab_{ul}$$

where:

MVbonds = Total market value of bond portfolio

$%Mv_i^{bonds}$ = Proportion of bond portfolio at rating i

$F^{\wedge up}$ = Defined as in the standard calculation

$duration_i$ = Average duration of bond portfolio at rating i, weighted with the market value of the bonds

and where $\Delta Liab_{ul}$ is the overall impact on the liability side for contracts where members and beneficiaries bear the investment risk with embedded options and guarantees of the stressed scenario, with a minimum value of 0 (sign convention: positive sign means losses). The stressed scenario is defined as a drop in value on the assets by

$$MV \, . \sum_i \%MV_i \bullet F^{up}(rating_i) \bullet duration_i$$

Mkt$_{conc}$ market risk concentrations

Description

SCR.5.109. The scope of the concentration risk sub-module extends to assets considered in the equity, spread risk and property risk sub-modules, and excludes assets covered by the counterparty default risk module in order to avoid any overlap between both elements of the standard calculation of the SCR.

SCR.5.110. As an example, risks derived from concentration in cash held at a bank are captured in the counterparty default risk module, while risks corresponding to concentration in other bank assets should be reflected in the concentration risk sub-module.

SCR.5.111. An appropriate assessment of concentration risks needs to consider both the direct and indirect exposures derived from the investments included in the scope of this sub-module.

SCR.5.112. For the sake of simplicity and consistency, the definition of market risk concentrations regarding financial investments is restricted to the risk regarding the accumulation of exposures with the same counterparty. It does not include other types of concentrations (e.g. geographical area, industry sector, etc.).

Input

SCR.5.113. Risk exposures in assets need to be grouped according to the counterparties involved.

E_i = Exposure at default to counterparty i

$Assets_{xl}$ = Total amount of assets considered in this sub-module.

$rating_i$ = External rating of the counterparty i

SCR.5.114. Where an IORP has more than one exposure to a counterparty then E_i is the aggregate of those exposures at default. $Rating_i$ should be a weighted

rating determined as the rating corresponding to a weighted average credit quality step, calculated as:

Weighted average credit quality step = rounded average of the credit quality steps of the individual exposures to that counterparty, weighted by the net exposure at default in respect of that exposure to that counterparty.

For the purpose of this calculation, credit quality steps 1A and 1B should be assigned a value of 0 and 1 respectively.

SCR.5.115. The exposure at default to an individual counterparty i should comprise assets covered by the concentration risk sub-module, including hybrid instruments, e.g. junior debt, mezzanine CDO tranches.

SCR.5.116. Exposures via investment funds or such entities whose activity is mainly the holding and management of an IORP's own investment need to be considered on a look-through basis. The same holds for CDO tranches and similar investments embedded in 'structured products'.

Output

SCR.5.117. The module delivers the following outputs:

Mkt_{conc}	=	Capital requirement concentration risk sub-module
$nMkt_{conc,TP}$	=	Capital requirement for concentration risk including loss absorbing capacity of technical provisions
$nMkt_{conc,SM}$	=	Capital requirement for concentration risk including loss absorbing capacity of security mechanisms

Calculation

SCR.5.118. The calculation is performed in three steps: (a) excess exposure, (b) risk concentration capital requirement per 'name', (c) aggregation.

SCR.5.119. The excess exposure is calculated as:

$$XS_i = \max\left(0; \frac{E_i}{Assets_{xl}} - CT \right),$$

where the concentration threshold CT, depending on the rating of counterparty i, is set as follows:

$rating_i$	Concentration threshold (CT)
AA-AAA	3%
A	3%

BBB	1.5%
BB or lower	1.5%

and where *Assets*$_{xl}$ is the total amount of assets considered in the concentration risk sub-module and should not include

a. assets held in respect of pension contracts where the investment risk is borne by the member or beneficiary;

b. assets covered in the counterparty default risk module.

SCR.5.120. The risk concentration capital requirement per 'name' i is calculated as the result of a pre-defined scenario:

$Conc_i = \Delta NAV | concentration\ shock$

The concentration risk shock on a name 'i' is the immediate effect on the net value of asset and liabilities expected in the event of an instantaneous decrease of values of $XS_i \bullet g_i$ in the concentrated exposure where the parameter g_i, depending on the credit rating of the counterparty, is determined as follows:

rating$_i$	Credit Quality Step	g_i
AAA	1A	0.12
AA	1B	0.12
A	2	0.21
BBB	3	0.27
BB or lower	4– 6	0.73

For unrated counterparties that are (re)insurance undertakings that will be subject to Solvency II and that would meet their MCR, the parameter g_i, depending on the solvency ratio (own funds/SCR), is determined as follows:

Solvency ratio	g_i
>175%	0.12
>150%	0.21
>125%	0.27
<125%	0.73

For other unrated counterparties, the parameter g_i should be 0.73.

Remark: The table right above will probably be adjusted when the QIS is performed.

SCR.5.121. The capital requirement for concentration risk is determined assuming no correlation among the requirements for each counterparty i.

$$Mkt_{conc} = \sqrt{\sum_i \left(Conc_i^2\right)}$$

SCR.5.122. This sub-module (as for the whole of the market risk module) is in the scope of the approach for the loss absorbency of technical provisions

Special reference to mortgage covered bonds and public sector covered bonds

SCR.5.123. In order to provide mortgage covered bonds and public sector covered bonds with a treatment in concentration risk sub-module according their specific risk features, the threshold applicable should be 15% when all the following requirements are met:

- the asset has a AA credit quality or better

- the covered bond meets the requirements defined in Article 22(4) of the UCITS directive 85/611/EEC

Concentration risk capital in case of properties

SCR.5.124. IORPs should identify the exposures in a single property higher than 10 per cent of 'total assets' (concentration threshold) considered in this sub-module according to paragraphs above (subsection *description*). Government bonds should be included in this amount, notwithstanding the exemption specified below.

SCR.5.125. For this purpose the IORP should take into account both properties directly owned and those indirectly owned (i.e. funds of properties), and both ownership and any other real exposure (mortgages or any other legal right regarding properties).

SCR.5.126. Properties located in the same building or sufficiently nearby should be considered a single property.

SCR.5.127. The risk concentration capital requirement per property i is calculated as the result of a pre-defined scenario:

$Conc_i = \Delta NAV|concentration\ shock$

The concentration risk shock on a property 'i' is the immediate effect on the net value of asset and liabilities expected in the event of an instantaneous decrease of values of $0.12 \bullet XS_i$ in the concentrated exposure.

Special reference to exposures to governments, central banks, multilateral development banks and international organisations

SCR.5.128. No capital requirement should apply for the purposes of this sub-module to borrowings by or demonstrably guaranteed by national government of an EEA state, issued in the currency of the government, or issued by a

multilateral development bank as listed in Annex VI, Part 1, Number 4 of the Capital Requirements Directive (2006/48/EC) or issued by an international organisation listed in Annex VI, Part 1, Number 5 of the Capital Requirements Directive (2006/48/EC) or issued by the European Central Bank.

SCR.5.129. To determine the concentrations risk capital requirement for exposures to governments or central banks denominated and funded in the domestic currency, other than those mentioned in the previous paragraph, the following parameters $g*_i$ should be used:

Concentration risk factors for exposures to non-EEA governments and central banks denominated and funded in the domestic currency

rating$_i$	Credit Quality Step	$g*_i$
AAA	1A	0
AA	1B	0
A	2	0.12
BBB	3	0.21
BB	4	0.27
B or lower, unrated	5– 6, -	0.73

Special reference to exposures to bank deposits

SCR.5.130. Bank deposits considered in the concentration risk sub-module[9] can be exempted to the extent their full value is covered by a government guarantee scheme in the EEA area, the guarantee is applicable unconditionally to the IORP and provided there is no double-counting of such guarantee with any other element of the SCR calculation.

Treatment of risks associated to SPV notes held by an IORP

SCR.5.131. SPV notes should be treated as follows:

1) SPV notes having mostly the features of fixed-income bonds, authorized, where the SPV is defined as in point (26) of Article 13 of Directive 2009/138/EC[10] and meet the requirements set out in Article 211 of Directive 2009/138/EC and rated BBB or better: Their risks should be considered in the 'spread risk', 'interest rate risk' and concentration sub-modules according its rating.

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[9] Risks derived from concentration in cash held at a bank are captured in the counterparty default risk module and are therefore not subject to the spread risk sub-module.
[10] "special purpose vehicle" means any undertaking, whether incorporated or not, other than an existing insurance or reinsurance undertaking, which assumes risks from IORPs and which fully funds its exposure to such risks through the proceeds of a debt issuance or any other financing mechanism where the repayment rights of the providers of such debt or financing mechanism are subordinated to the (re)insurance obligations of such an undertaking.

2) Others SPV notes, including those having significant features of equities (i.e. equity tranche notes): Their risks should be considered in the 'equity risk' sub-module. For this purpose the SPV notes should be considered as non-traded equities, unless they are traded actively in a financial market.

3.6. SCR Counterparty default risk module

Introduction

Description

SCR.6.1. The counterparty default risk module should reflect possible losses due to unexpected default or deterioration in the credit standing of the counterparties and debtors of IORPs over the forthcoming twelve months. The scope of the counterparty default risk module includes risk-mitigating contracts, such as (re)insurance arrangements, securitisations and derivatives, and receivables from intermediaries, as well as any other credit exposures which are not covered in the spread risk sub-module.

SCR.6.2. In addition, the SCR for sponsor support is calculated in this sub-module.

SCR.6.3. For each counterparty, the counterparty default risk module should take account of the overall counterparty risk exposure of the IORP concerned to that counterparty, irrespective of the legal form of its contractual obligations to that IORP.

SCR.6.4. A differentiation of two kinds of exposures, in the following denoted by type 1 and type 2 exposures, and a different treatment according to their characteristics has to be applied.

SCR.6.5. The class of type 1 exposures covers the exposures which may not be diversified and where the counterparty is likely to be rated. The class should consist of exposures in relation to

- sponsor support,
- (re)insurance arrangements,
- securitisations and derivatives,
- any other risk mitigating contracts,
- cash at bank,
- deposits with ceding institutions, if the number of independent counterparties does not exceed 15,
- capital, initial funds, letters of credit as well as any other commitments received by the IORP which have been called up but are unpaid, if the number of independent counterparties does not exceed 15, and
- guarantees, letters of credit, letters of comfort which the IORP has provided as well as any other commitments which the IORP has provided and which depend on the credit standing of a counterparty.

SCR.6.6. For determining the number of independent counterparties, counterparties which belong to the same corporate group, in particular a group as defined in Article 212 of the Solvency II Framework Directive, or to the same financial conglomerate as defined in Article 2(14) of the Financial Conglomerate Directive (2002/87/EC), or to the same pooling arrangement, should not be treated as independent counterparties.

SCR.6.7. The class of type 2 exposures covers the exposures which are usually diversified and where the counterparty is likely to be unrated. The class of type 2 exposure should consist of all exposures which are in the scope of the module and are not of type 1, in particular

- receivables from intermediaries,

- members and beneficiaries debtors, including mortgage loans,

- deposits with ceding institutions, if the number of independent counterparties exceeds 15, and

- capital, initial funds, letters of credit as well as any other commitments received by the IORP which have been called up but are unpaid, if the number of independent counterparties exceeds 15.

- Other mortgage loans

SCR.6.8. IORPs are allowed to classify deposits with ceding institutions and called up but unpaid commitments as type 1 exposures even if the number of independent counterparties exceeds 15. However, IORPs must then classify all such exposures as type 1 or as type 2.

Input

SCR.6.9. The following input information is required in relation to type 1 exposures:

SponsorSupport	=	Value of sponsor support on holistic balance sheet
Recoverables$_i$	=	Best estimate recoverables from the (re)insurance contract (or SPV) *i* plus any other debtors arising out of the (re)insurance arrangement or SPV securitisation
MarketValue$_i$	=	Value of the derivative *i* according to section on valuation
Collateral$_i$	=	Risk-adjusted value of collateral in relation to the (re)insurance arrangement or SPV securitisation *i* or in relation to derivative *i*
Guarantee$_i$	=	Nominal value of the guarantee, letter of credit, letter of comfort or similar commitment *i*
MVGuarantee$_i$	=	Value according to section on valuation of the guarantee, letter of credit, letter of comfort or similar commitment *i*
Rating$_i$	=	Rating of counterparty in relation

(re)insurance, SPV, derivative, guarantee, letter of credit, letter of comfort or similar commitment i

SCR.6.10. The following input information is required in relation to type 2 exposures:

E	=	Sum of the values of type 2 exposures, except for receivables from intermediaries which are due for more than 3 months.
$E_{past\text{-}due}$	=	Sum of the values of receivables from intermediaries which are due for more than 3 months.

Output

SCR.6.11. The module delivers the following output:

SCR_{def}	=	Capital requirement for counterparty default risk
$nSCR_{def,\ TP}$	=	Capital requirement for counterparty default risk including the risk absorbing capacity of technical provisions
$nSCR_{def,\ SM}$	=	Capital requirement for counterparty default risk including the risk absorbing capacity of security mechanisms

Calculation

SCR.6.12. The capital requirements for type 1 and type 2 exposures should be calculated separately. A low diversification effect should be allowed in the aggregation of the requirements as follows:

$$SCR_{def} = \sqrt{SCR_{def,1}^2 + 1.5 \cdot SCR_{def,1} \cdot SCR_{def,2} + SCR_{def,2}^2},$$

where

SCR_{def} = Capital requirement for counterparty default risk

$SCR_{def,1}$ = Capital requirement for counterparty default risk of type 1 exposures

$SCR_{def,2}$ = Capital requirement for counterparty default risk of type 2 exposures

SCR.6.13. Additionally, IORPs should determine the capital requirement for counterparty default risk including the loss absorbing capacity of technical provisions $nSCR_{def,TP}$ and security mechanisms $nSCR_{def,SM}$ as the loss in net asset value resulting from a counterparty default loss of the amount SCR_{def}.

Calculation of capital requirement for type 1 exposures

SCR.6.14. The main inputs of the counterparty default risk module are the estimated loss-given-default (LGD) of an exposure and the probability of default (PD)

of the counterparty. Given probabilities of default and losses-given-default (LGD) of the counterparties in the portfolio of type 1 exposures, the capital requirement for type 1 exposures is calculated as follows:

(1) Where the standard deviation of the loss distribution of type 1 exposures is lower than or equal to 7.05 % of the total losses-given-default on all type 1 exposures, the capital requirement for counterparty default risk on type 1 exposures shall be equal to the following:

$$SCR_{def,1} = 3 \cdot \sigma$$

where σ denotes the standard deviation of the loss distribution of type 1 exposures.

(2) Where the standard deviation of the loss distribution of type 1 exposures is higher than 7.05 % of the total losses-given-default on all type 1 exposures and lower than 20 % of the total losses-given-default on all type 1 exposures, the capital requirement for counterparty default risk on type 1 exposures shall be equal to the following:

$$SCR_{def,1} = 5 \cdot \sigma$$

where σ denotes the standard deviation of the loss distribution of type 1 exposures.

(3) Where the standard deviation of the loss distribution of type 1 exposures is higher than 20 % of the total losses-given-default on all type 1 exposures, the capital requirement for counterparty default risk on type 1 exposures shall be equal to the total losses-given-default on all type 1 exposures.

(4) The standard deviation of the loss distribution of type 1 exposures shall be equal to the following:

$$\sigma = \sqrt{V}$$

where *V* denotes the variance of the loss distribution of type 1 exposures.

SCR.6.15. Variance of the loss distribution of type 1 exposures

(1) The variance of the loss distribution of type 1 exposures as referred to above shall be equal to the sum of V_{inter} and V_{intra}.

(2) V_{inter} shall be equal to the following:

$$V_{\text{int } er} = \sum_{(j,k)} \frac{PD_k \cdot (1 - PD_k) \cdot PD_j \cdot (1 - PD_j)}{1.25 \cdot (PD_k + PD_j) - PD_k \cdot PD_j} \cdot TLGD_j \cdot TLGD_k$$

where:

a) the sum covers all possible combinations (*j*,*k*) of different probabilities of default on independent counterparties in accordance with (3) below;

b) TLGD_j and $TLGD_k$ denote the sum of losses-given-default on type 1 exposures from counterparties bearing a probability of default *PDj* and *PDk* respectively .

(3) V_intra shall be equal to the following:

$$V_{\text{int } ra} = \sum_{j} \frac{1.5 \cdot PD_j \cdot (1 - PD_j)}{2.5 - PD_j} \cdot \sum_{PD_j} LGD_i^2$$

where:

a) the first sum covers all different probabilities of default on independent counterparties in accordance with the table below

b) the second sum covers all independent counterparties that have a probability of default equal to PD_j.

c) LGD_i denotes the loss-given-default on the independent counterparty i.

and where PD_i denotes the probability of default. This should be set as follows:

Rating$_i$	Credit Quality Step	PD_i
AAA	0	0.002%
AA	1	0.01%
A	2	0.05%
BBB	3	0.24%
BB	4	1.20%
B	5	4.175%
CCC or lower	6	4.175%

In cases where more than one rating is available for a counterparty, the second-highest rating should be used.

Counterparties without a credit rating

SCR.6.16. For unrated counterparties that are insurance or reinsurance undertakings that will be subject to Solvency II and that would meet their MCR, the probability of default, depending on the solvency ratio (own funds/SCR), is determined as follows:

Solvency ratio	PD_i
196%	0.01%
175%	0.05%
150%	0.1%
125%	0.2%

122%	0.24%
100%	0.5%
95%	1.2%
75%	4.175%

For unrated counterparties that are insurance of reinsurance undertakings that will be subject to Solvency 2 and that would not meet their MCR, the probability of default should be 4.175%.

The probability of default for unrated banks compliant with the Capital Requirements Directive (2006/48/EC) should be 0.5 %.

For other unrated counterparties, the probability of default should be 4.175%.

Probability of default for the sponsor

SCR.6.17. For calculating the SCR for a possible default of the sponsor the same probabilities of default as described above for other counterparties shall be applied.

Loss-given-default for the sponsor

SCR.6.18. The loss given default for the sponsor should be the 50 % of the value of sponsor support shown in the holistic balance sheet:

LGD = 50% SponsorSupport

Loss-given-default for risk-mitigating contracts

SCR.6.19. The LGD of an exposure is conceptually defined to be the loss of basic own funds which the IORP would incur if the counterparty defaulted.

SCR.6.20. For a (re)insurance arrangement or securitisation *i*, the loss-given-default *LGD$_i$* should be calculated as follows:

$$LGD_i = \max(50\% \cdot (\mathrm{Recoverables}_i) - F \cdot Collateral_i; 0),$$

where

Recoverables$_i$ = Best estimate recoverables from the (re)insurance contract (or SPV) *i* plus any other debtors arising out of the (re)insurance arrangement or SPV securitisation

Collateral$_i$ = Risk-adjusted value of collateral in relation to the (re)insurance arrangement or SPV securitisation i

F = a factor, defined below, to take into account the economic effect of the collateral arrangement in relation to the (re)insurance arrangement or SPV securitisation in case of any credit event related to the counterparty.

SCR.6.21. However, if a (re)insurance counterparty has tied up an amount for collateralisation commitments (both on and off balance sheet, including commitments) greater than 60% of the assets on its balance sheet, the loss-given-default *LGD$_i$* should be calculated as follows:

$$LGD_i = \max\left(90\% \cdot (\text{Re}\,\text{cov}\,erables_i) - F^{'} \cdot Collateral_i; 0\right)$$

where

Recoverables$_i$ = Best estimate recoverables from the (re)insurance contract (or SPV) *i* plus any other debtors arising out of the (re)insurance arrangement or SPV securitisation

Collateral$_i$ = Risk-adjusted value of collateral in relation to the (re)insurance arrangement or SPV securitisation *i*

F' = a factor, defined below, to take into account the economic effect of the collateral arrangement in relation to the (re)insurance arrangement or SPV securitisation in case of any credit event related to the counterparty.

SCR.6.22. For a derivative *i*, the loss-given-default *LGD$_i$* should be calculated as follows:

$$LGD_i = \max\left(90\% \cdot (Derivative_i) - F^{'} \cdot Collateral_i; 0\right),$$

where

Derivative$_i$ = Value of the derivative *i* .

Collateral$_i$ = Risk-adjusted value of collateral in relation to the derivative *i*

F' = a factor to take into account the economic effect of the collateral arrangement in relation to the (re)insurance arrangement or SPV securitisation in case of any credit event related to the counterparty.

SCR.6.23. Where in case of insolvency of the counterparty, the determination of the IORP's proportional share of the counterparty's insolvency estate in the excess of the collateral does not take into account that the IORP receives the collateral, the factors F and F' above shall both be 100 %. In all other cases these factors shall be 50 % and 90 % respectively.

Loss-given-default for mortgages

SCR.6.24. The loss-given default on a mortgage loan shall be equal to the following:

$$LGD = \max(Loan - 80\% \cdot Mortgage; 0)$$

where

a)   *Loan* denotes the value of the mortgage loan in accordance with Article 75 of Directive 2009/138/EC

b)   Mortgage denotes the risk-adjusted value of the mortgage.

SCR.6.25. Risk-adjusted value of mortgage

(1)   The risk-adjusted value of mortgage shall be equal to the difference between the value of the residential property held as

mortgage, valued in accordance with (2) below, and the adjustment for market risk, as referred to in (3) below.

(2)   The value of the residential property held as mortgage shall be the market value reduced as appropriate to take account of any prior claims on the property.

(3)   The adjustment for market risk referred to in (1) above is the difference between the following capital requirements:

(a)   the hypothetical capital requirement for market risk of the IORP that would apply if the residential property held as mortgage were not included in the calculation; and

(b)   the hypothetical capital requirement for market risk of the IORP that would apply if the residential property held as mortgage were included in the calculation.

(4)   For the purpose of (2) above, the currency risk of the residential property held as mortgage shall be calculated by comparing the currency of the residential property against the currency of the corresponding loan.

Calculation of capital requirement for type 2 exposures

SCR.6.26.   The capital requirement for counterparty default risk of type 2 exposures is determined as the result of a pre-defined scenario:

$SCR_{def,2} = \Delta NAV \mid type\ 2\ counterparty\ default\ shock$

SCR.6.27.   The capital requirement for counterparty default risk on type 2 exposures shall be equal to the loss in the basic own funds that would result from an instantaneous decrease in value of type 2 exposures. by the following amount:

$$90\% \cdot LGD_{receivables>3months} + \sum_{i} 15\% \cdot LGD_i$$

where:

a) $LGD_{receivables>3months}$ denote the total losses-given-default on all receivables from intermediaries which have been due for more than three months

b)   the sum is taken on all type 2 exposures other than receivables from intermediaries which have been due for more than three months;

c) LGD_i denotes the loss-given-default on the type 2 exposure *i*.

Treatment of risk mitigation techniques

SCR.6.28.   The counterparty default risk module should take into account techniques to mitigate default risk like collaterals or netting of receivables with liabilities. Allowance should be made as follows:

Collaterals

SCR.6.29. If a collateral meets the two following requirements:

    a. The legal mechanism by which collateral is pledged or transferred should ensure that the IORP has the right to liquidate or take legal possession of the collateral, in a timely manner, in case of any default event related to the counterparty ("the counterparty requirement");

    b. Where applicable, the legal mechanism by which collateral is pledged or transferred should ensure that the IORP has the right to liquidate or take possession of the collateral, in a timely manner, in case of any default event related to a third party holding the collateral ("the third party requirement"),

then the loss-given-default (in case of a type 1 exposure) or the value of the exposure (in case of a type 2 exposure) may be reduced by the risk-adjusted value of the collateral.

The risk-adjusted value of the collateral should be calculated as follows:

$$Collateral = 100\% \cdot \left(MarketValue_{Collateral} - MktRisk_{Collateral} \right),$$

where

$MarketValue_{Collateral}$ = Market value of the collateral assets

$MktRisk_{Collateral}$ = Adjustment for market risk.

SCR.6.30. If the collateral is held by or deposited with a third party custodian and the collateral only meets the counterparty requirement, then the risk-adjusted value of the collateral should be calculated as follows:

$$Collateral = 90\% \cdot \left(MarketValue_{Collateral} - MktRisk_{Collateral} \right),$$

where

$MarketValue_{Collateral}$ = Market value of the collateral assets

$MktRisk_{Collateral}$ = Adjustment for market risk.

SCR.6.31. The adjustment for market risk is the difference between the following capital requirements:

    a) the hypothetical capital requirement for market risk of the IORP that would apply if the assets held as collateral are not included in the calculation; and

    b) the hypothetical capital requirement for market risk of the IORP that would apply if the assets held as collateral are included in the calculation.

Simplification

SCR.6.32. Simplified calculation of the risk adjusted value of collateral to take into account the economic effect of the collateral:

If it is proportionate to the nature, scale and complexity of the risks inherent in the collateral arrangement that meets both the counterparty and the custodian requirements a simplification as follows can be applied:

$$Collateral = 85\% \cdot MarketValue_{Collateral}$$

Where the collateral is held by or deposited with a third party custodian and the collateral only meets the counterparty requirement, a simplification as follows can be applied:

$$Collateral = 75\% \cdot MarketValue_{Collateral}$$

3.7. Pension liability risk

Structure of the pension liability risk module

SCR.7.1. This module covers the risk arising from the underwriting or taking over of pension liabilities, associated with both the perils covered and the processes followed in the conduct of the business.

SCR.7.2. The scope of the pension liability risk module includes all the pension obligations.

SCR.7.3. The calculations of capital requirements in the pension liability risk module are based on specified scenarios. General guidance about the interpretation of the scenarios can be found in section 3.1.

Description

SCR.7.4. The pension liability risk module consists of seven sub-modules for mortality risk, longevity risk, disability/morbidity risk, benefit option risk, expense risk, revision risk and catastrophe risk.

Input

SCR.7.5. The following input information is required:

$Pension_{rev}$	=	Capital requirement for revision risk
$Pension_{mort}$	=	Capital requirement for mortality risk
$Pension_{long}$	=	Capital requirement for longevity risk
$Pension_{dis}$	=	Capital requirement for disability risk
$Pension_{lapse}$	=	Capital requirement for benefit option risk
$Pension_{exp}$	=	Capital requirement for expense risk
$Pension_{CAT}$	=	Capital requirement for catastrophe risk
$Pension_{rev, TP}$	=	Capital requirement for revision risk including the loss-absorbing capacity of technical provisions
$nPension_{mort, TP}$	=	Capital requirement for mortality risk including the loss-absorbing capacity of technical provisions
$nPension_{long, TP}$	=	Capital requirement for longevity risk including the loss-absorbing capacity of technical provisions
$nPension_{dis, TP}$	=	Capital requirement for disability risk including the loss-absorbing capacity of technical provisions

$nPension_{lapse, TP}$ = Capital requirement for benefit option risk including the loss-absorbing capacity of technical provisions

$nPension_{exp, TP}$ = Capital requirement for expense risk including the loss-absorbing capacity of technical provisions

$nPension_{CAT, TP}$ = Capital requirement for catastrophe risk including the loss-absorbing capacity of technical provisions

$nPension_{rev, SM}$ = Capital requirement for revision risk including the loss-absorbing capacity of security mechanisms

$nPension_{mort,SM}$ = Capital requirement for mortality risk including the loss-absorbing capacity of security mechanisms

$nPension_{long, SM}$ = Capital requirement for longevity risk including the loss-absorbing capacity of security mechanisms

$nPension_{dis, SM}$ = Capital requirement for disability risk including the loss-absorbing capacity of security mechanisms

$nPension_{lapse, SM}$ = Capital requirement for benefit option risk including the loss-absorbing capacity of security mechanisms

$nPension_{exp, SM}$ = Capital requirement for expense risk including the loss-absorbing capacity of security mechanisms

$nPension_{CAT,SM}$ = Capital requirement for catastrophe risk including the loss-absorbing capacity of security mechanisms

Output

SCR.7.6. The module delivers the following output:

$SCR_{Pension}$ = Capital requirement for pension liability risk

$nSCR_{Pension,TP}$ = Capital requirement for pension liability risk including the loss absorbing capacity of technical provisions

$nSCR_{Pension,SM}$ = Capital requirement for pension liability risk including the loss absorbing capacity of security mechanisms

<u>Calculation</u>

SCR.7.7. The capital requirement for pension liability risk is derived by combining the capital requirements for the pension sub-risks using a correlation matrix as follows:

$$SCR_{Pension} = \sqrt{\sum_{rxc} CorrPension_{r,c} \cdot Pension_r \cdot Pension_c}$$

where

$CorrPension_{r,c}$ = The entries of the correlation matrix *CorrPension*

$Pension_r, Pension_c$ = Capital requirements for individual pension liability sub-risks according to the rows and columns of correlation matrix *CorrPension*

and where the correlation matrix *CorrPension* is defined as follows:

	Mortality	Longevity	Disability	Benefit option	Expenses	Revision	CAT
Mortality	1						
Longevity	-0.25	1					
Disability	0.25	0	1				
Benefit option	0	0.25	0	1			
Expenses	0.25	0.25	0.5	0.5	1		
Revision	0	0.25	0	0	0.5	1	
CAT	0.25	0	0.25	0.25	0.25	0	1

SCR.7.8. The net capital requirement for nSCR$_{Pension,TP}$ is determined as follows:

$$nSCR_{Pension,TP} = \sqrt{\sum_{rxc} CorrPension_{r,c} \cdot nPension_{r,TP} \cdot nPension_{c,TP}}$$

SCR.7.9. The net capital requirement for nSCR$_{Pension,SM}$ is determined as follows:

$$nSCR_{Pension,SM} = \sqrt{\sum_{rxc} CorrPension_{r,c} \cdot nPension_{r,SM} \cdot nPension_{c,SM}}$$

Pension$_{mort}$ mortality risk

<u>Description</u>

SCR.7.10. Mortality risk is associated with pension obligations where an IORP guarantees to make a single or recurring series of payments in the event of the death of the member or beneficiary during the policy term.

SCR.7.11. It is applicable for pension obligations contingent on mortality risk i.e. where the amount currently payable on death exceeds the technical provisions held and, as a result, an increase in mortality rates leads to an increase in the technical provisions.

SCR.7.12. The capital requirement should be calculated as the change in net asset value (assets minus liabilities) following a permanent increase in mortality rates.

SCR.7.13. Where pension obligations provide benefits both in case of death and survival and the death and survival benefits are contingent on the life of the same person, these obligations do not need to be unbundled. For these contracts the mortality scenario can be applied fully allowing for the netting effect provided by the 'natural' hedge between the death benefits component and the survival benefits component (note that a floor of zero applies at the level of contract if the net result of the scenario is favourable to the IORP).

SCR.7.14. Where model points are used for the purposes of calculating the technical provisions and the grouping of the data captures appropriately the mortality risk of the portfolio, each model point can be considered to represent a single policy for the purposes of the sub-module.

Input

SCR.7.15. No specific input data is required for this module.

Output

SCR.7.16. The module delivers the following output:

$Pension_{mort}$ = Capital requirement for mortality risk

$nPension_{mort,\ TP}$ = Capital requirement for mortality risk including the loss-absorbing capacity of technical provisions

$nPension_{mort,\ SM}$ = Capital requirement for mortality risk including the loss-absorbing capacity of security mechanisms

Calculation

SCR.7.17. The capital requirement for mortality risk is defined as the result of a mortality scenario defined as follows:

$$Pension_{mort} = \left(\Delta NAV \mid mortshock \right)$$

where

ΔNAV = The change in the net value of assets minus liabilities

| mortshock | = | A permanent 15% increase in mortality rates for each age and each member or beneficiary where the payment of benefits (either lump sum or multiple payments) is contingent on mortality risk |

SCR.7.18. The mortality scenario should be calculated under the condition that the scenario does not change the value of technical provisions and security mechanisms as a consequence of their loss-absorbing capacity.

SCR.7.19. Additionally, the result of the scenario should be determined under the condition that the value of technical provisions and security mechanisms can change in response to the shock being tested. The resulting capital requirements are $nPension_{mort,TP}$, and $nPension_{mort,SM}$.

Simplification

SCR.7.20. The simplification may be used provided that it is proportionate to the nature, scale and complexity of the risks that the IORP faces.

SCR.7.21. The capital requirement for mortality risk according to the simplified calculation is $Pension_{mort} = 0.15 \cdot CAR \cdot q \cdot \sum_{k=1-0,5}^{n-0,5} \left(\frac{1-q}{1+i_k} \right)^k$, with

- CAR the total capital at risk,
- q an IORP-specific expected average death rate over the next year (weighted by the sum assured),
- n the modified duration in years of payments payable on death included in the best estimate.
- i_k the annualized spot rate for maturity k of the relevant risk-free term structure.

Pension$_{long}$ longevity risk

Description

SCR.7.22. Longevity risk is associated with pension obligations (such as annuities) where an IORP guarantees to make recurring series of payments until the death of the member or beneficiary and where a decrease in mortality rates leads to an increase in the technical provisions, or with pension obligations where an IORP guarantees to make a single payment in the event of the survival of the member of beneficiary for the duration of the policy term.

SCR.7.23. It is applicable for pension obligations contingent on longevity risk i.e. where there is no death benefit or the amount currently payable on death is less than the technical provisions held and, as a result, a decrease in mortality rates is likely to lead to an increase in the technical provisions.

SCR.7.24. The capital requirement should be calculated as the change in net asset value (assets minus liabilities) following a permanent decrease in mortality rates.

SCR.7.25. Where pension obligations provide benefits both in case of death and survival and the death and survival benefits are contingent on the life of the same person(s), these obligations do not need to be unbundled. For these contracts the longevity scenario can be applied fully allowing for the netting effect provided by the 'natural' hedge between the death benefits component and the survival benefits component (note that a floor of zero applies at the level of contract if the net result of the scenario is favourable to the IORP).

SCR.7.26. Where model points are used for the purposes of calculating the technical provisions and the grouping of the data captures appropriately the longevity risk of the portfolio, each model point can be considered to represent a policy for the purposes of applying this sub-module.

Input

SCR.7.27. No specific input data is required for this module.

Output

SCR.7.28. The module delivers the following output:

$Pension_{long}$ = Capital requirement for longevity risk

$nPension_{long, TP}$ = Capital requirement for longevity risk including the loss-absorbing capacity of technical provisions

$nPension_{long, SM}$ = Capital requirement for longevity risk including the loss-absorbing capacity of security mechanisms

Calculation

SCR.7.29. The capital requirement for longevity risk is defined as a result of a longevity scenario as follows:

$$Pension_{long} = \left(\Delta NAV \,|\, longevity shock \right)$$

where

ΔNAV = The change in the net value of assets minus liabilities

$longevity shock$ = a (permanent) 20% decrease in mortality rates for each age and each policy where the payment of benefits (either lump sum or multiple payments) is contingent on longevity risk

SCR.7.30. The longevity scenario should be calculated under the condition that the scenario does not change the value of technical provisions and security mechanisms as a consequence of their loss-absorbing capacity.

SCR.7.31. Additionally, the result of the scenario should be determined under the condition that the value of technical provisions and security mechanisms can change in response to the shock being tested. The resulting capital requirements are $nPension_{long,TP}$ and $nPension_{long,SM}$.

Simplification

SCR.7.32. The simplification may be used if it is proportionate to the nature, scale and complexity of the risks that the IORP faces.

SCR.7.33. The capital requirement for longevity risk according to the simplified calculation can be taken as 20 per cent (the longevity shock rate) of the product of the following factors:

- the best estimate for contracts subject to longevity risk,

- an IORP-specific expected average death rate over the next year (weighted by the sum assured),

- the modified duration of the liability cash-flows n and

- the projected mortality increase ($1.1^{((n-1)/2)}$), based on the assumption that the average mortality rate of the portfolio, due to age, increases over the period corresponding to the length of the duration with 10% a year.

Pension$_{dis}$ disability-morbidity risk

Description

SCR.7.34. Morbidity or disability risk is the risk of loss, or of adverse changes in the value of liabilities, resulting from changes in the level, trend or volatility of disability and morbidity rates.

SCR.7.35. It is applicable for obligations contingent on a definition of disability.

SCR.7.36. The obligations may be structured such that, upon the diagnosis of a disease or the member being unable to work as a result of sickness or disability, recurring payments are triggered. These payments may continue until the expiry of some defined period of time or until either the recovery or death of the member/beneficiary. In the latter case, the IORP is also exposed to the risk that the member/beneficiary receives the payments for longer than anticipated i.e. that claim termination rates are lower than anticipated (recovery risk).

Input

SCR.7.37. No specific input data is required for this module.

Output

SCR.7.38. The module delivers the following output:

$Pension_{dis}$	=	Capital requirement for disability risk
$nPension_{dis, TP}$	=	Capital requirement for disability risk including the loss-absorbing capacity of technical provisions

$nPension_{dis,\,SM}$ = Capital requirement for disability risk including the loss-absorbing capacity of security mechanisms

Calculation

SCR.7.39. The capital requirement for disability risk is defined as the result of a disability scenario as follows:

$$Pension_{dis} = (\Delta NAV \mid disshock)$$

where

ΔNAV = Change in the net value of assets minus liabilities

$Disshock$ = A combination of the following changes applied to each policy where the payment of benefits (either lump sum or multiple payments) is contingent on disability risk:

- An increase of 35% in disability rates for the next year, together with a (permanent) 25% increase (over best estimate) in disability rates at each age in following years

- Plus, where applicable, a permanent decrease of 20% in morbidity/disability recovery rates.

SCR.7.40. The disability-morbidity scenario should be calculated under the condition that the scenario does not change the value of technical provisions and security mechanisms as a consequence of their loss-absorbing capacity.

SCR.7.41. Additionally, the result of the scenario should be determined under the condition that the value of technical provisions and security mechanisms can change in response to the shock being tested. The resulting capital requirements are $nPension_{dis,TP}$ and $nPension_{dis,SM}$.

Simplification

SCR.7.42. The simplification may be used if it is proportionate to the nature, scale and complexity of the risks that the IORP faces.

SCR.7.43. The capital requirement for disability risk according to the simplified calculation is:
$$Pension_{dis} = \begin{cases} 0.35 \cdot CAR_1 \cdot d_1 \\ + 0.25 \cdot 1.1^{(n-3)/2} \cdot (n-1) \cdot CAR_2 \cdot d_2 \\ + 0.2 \cdot 1.1^{(n-1)/2} \cdot t \cdot n \cdot BE_{dis} \end{cases}$$

where with respect to policies with a positive capital at risk:

a) CAR_1 denotes the total capital at risk, meaning the sum, in relation to each contract, of the higher of zero and the difference between the following amounts:

i. the sum of:

- the amount that the IORP would currently pay in the event of the death or disability of the persons insured under the contract after deduction of the amounts recoverable from (re)insurance contracts and special purpose vehicles; and
- the expected present value of amounts not covered in the previous indent that the IORP would pay in the future in the event of the immediate death or disability of the persons insured under the contract after deduction of the amounts recoverable from (re)insurance contracts and special purpose vehicles;

    ii. the best estimate of the corresponding obligations after deduction of the amounts recoverable form (re)insurance contracts and special purpose vehicles;

b) CAR_2 denotes the total capital at risk as defined in letter (a after 12 months;

c) d_1 denotes the expected average disability-morbidity rate during the following 12 months respectively weighted by the sum insured;

d) d_2 denotes the expected average disability-morbidity rate in the 12 months after the following 12 months weighted by the sum insured;

e) n denotes the modified duration of the payments on disability-morbidity included in the best estimate;

f) t denotes the expected termination rates during the following 12 months;

g) BE_{dis} denotes the best estimate of obligations subject to disability-morbidity risk.

Pension_{option} benefit option risk

<u>Description</u>

SCR.7.44. Benefit option risk is the risk of loss or change in liabilities due to a change in the expected exercise rates of certain options of members and beneficiaries or sponsors. In relation to members', beneficiaries' or sponsors' options that the benefit option sub-module covers, a comprehensive approach is taken. The module takes account of certain legal or contractual options of members, beneficiaries or sponsors which can significantly change the value of the future cash-flows. The options to be taken into account in this module are those to fully or partly terminate, decrease, restrict or suspend the cover provided by the IORP as well as options which allow the full or partial establishment, renewal, increase, extension or resumption of this cover.

SCR.7.45. This module should not take into account a legal or contractual option of the sponsor to terminate a pension promise as a whole/for all entitled members and beneficiaries, in a way that would lead to a windup of the scheme or IORP.

SCR.7.46. In the following, the term "lapse" is used to denote all these options.

<u>Input</u>

SCR.7.47. No specific input data is required for this module.

<u>Output</u>

SCR.7.48. The module delivers the following output:

$Pension_{lapse}$	=	Capital requirement for benefit option risk (not including the loss-absorbing capacity of technical provisions)
$nPension_{lapse, TP}$	=	Capital requirement for benefit option risk including the loss-absorbing capacity of technical provisions
$nPension_{lapse, SM}$	=	Capital requirement for benefit option risk including the loss-absorbing capacity of security mechanisms

Calculation

SCR.7.49. The capital requirement for benefit option risk should be calculated as follows:

If $\max((nLapse_{down,TP} + nLapse_{down,SM})$; $(nLapse_{up,TP} + nLapse_{up,SM})$; $(nLapse_{mass,TP} + nLapse_{mass,SM})) = (nLapse_{down,TP} + nLapse_{down,SM})$ then $Pension_{lapse} = Lapse_{down}$, $nPension_{lapse,TP} = nLapse_{down,TP}$ and $nPension_{lapse,SM} = nLapse_{down,SM}$;

otherwise, if $\max((nLapse_{down,TP} + nLapse_{down,SM})$; $(nLapse_{up,TP} + nLapse_{up,SM})$; $(nLapse_{mass,TP} + nLapse_{mass,SM}) = (nLapse_{up,TP} + nLapse_{up,SM})$ then $Pension_{lapse} = Lapse_{up}$, $nPension_{lapse,TP} = nLapse_{up,TP}$ and $nPension_{lapse,SM} = nLapse_{up,SM}$;

otherwise $Pension_{lapse} = Lapse_{mass}$, $nPension_{lapse,TP} = nLapse_{mass,TP}$ and $nPension_{lapse,SM} = nLapse_{mass,SM}$

where

$Pension_{lapse}$	=	Capital requirement for lapse risk
$Lapse_{down}$	=	Capital requirement for the risk of a permanent decrease of the rates of lapsation
$Lapse_{up}$	=	Capital requirement for the risk of a permanent increase of the rates of lapsation
$Lapse_{mass}$	=	Capital requirement for the risk of a mass lapse event
$nPension_{lapse, TP}$	=	Capital requirement for lapse risk, including the loss-absorbing capacity of technical provisions
$nLapse_{down, TP}$	=	Capital requirement for the risk of a permanent decrease of the rates of lapsation, including the loss-absorbing capacity of technical provisions
$nLapse_{up, TP}$	=	Capital requirement for the risk of a permanent increase of the rates of lapsation, including the loss-absorbing capacity of technical provisions
$nLapse_{mass, TP}$	=	Capital requirement for the risk of a mass lapse event, including the loss-absorbing capacity of technical provisions
$nPension_{lapse, SM}$	=	Capital requirement for lapse risk, including the loss-absorbing capacity of security mechanisms
$nLapse_{down, SM}$	=	Capital requirement for the risk of a permanent

decrease of the rates of lapsation, including the loss-absorbing capacity of security mechanisms

$nLapse_{up,\,SM}$ = Capital requirement for the risk of a permanent increase of the rates of lapsation, including the loss-absorbing capacity of security mechanisms

$nLapse_{mass,\,SM}$ = Capital requirement for the risk of a mass lapse event, including the loss-absorbing capacity of security mechanisms

SCR.7.50. Capital requirements for the three sub-risks should be calculated based on a member-by-member comparison of surrender value and best estimate provision. The surrender strain of a member is defined as the difference between the amount currently payable on surrender and the best estimate provision held. The amount payable on surrender should be calculated net of any amounts recoverable from members or agents e.g. net of any surrender charge that may be applied under the terms of the contract. In this context, the term "surrender" should refer to all kind of contract terminations irrespective of their name in the terms and conditions of the contract. In particular, the surrender value may be zero if no compensation is paid on termination.

SCR.7.51. The capital requirement for the risk of a permanent decrease of the rates of lapsation should be calculated as follows:

$$Lapse_{down} = \Delta NAV \,|\, lapseshock_{down},$$

where

ΔNAV = Change in the net value of assets minus liabilities (not including changes in the risk margin of technical provisions)

$lapseshock_{down}$ = Reduction of 50% in the assumed option take-up rates in all future years for all policies without a positive surrender strain or otherwise adversely affected by such risk. Affected by the reduction are options to fully or partly terminate, decrease, restrict or suspend the cover provided by the IORP. Where an option allows the full or partial establishment, renewal, increase, extension or resumption of this cover, the 50% reduction should be applied to the rate that the option is not taken up.

The shock should not change the rate to which the reduction is applied to by more than 20% in absolute terms.

SCR.7.52. The capital requirement for the risk of a permanent increase of the rates of lapsation should be calculated as follows:

$$Lapse_{up} = \Delta NAV \,|\, lapseshock_{up},$$

where

ΔNAV = Change in the net value of assets minus liabilities (not including changes in the risk margin of technical provisions)

$lapseshock_{up}$ = Increase of 50% in the assumed option take-up rates in all future years for all policies with a positive surrender strain or otherwise adversely affected by such risk. Affected by the increase are options to fully or partly terminate, decrease, restrict or suspend the cover provided by the IORP. Where an option allows the full or partial establishment, renewal, increase, extension or resumption of this cover, the 50% increase should be applied to the rate that the option is not taken up. The shocked rate should not exceed 100%.

SCR.7.53. Therefore, the shocked take-up rate should be restricted as follows:

$$R_{up}(R) = \min(150\% \cdot R; 100\%) \quad \text{and}$$

$$R_{down}(R) = \max(50\% \cdot R; R - 20\%),$$

where

R_{up} = shocked take-up rate in $lapseshock_{up}$

R_{down} = shocked take-up rate in $lapseshock_{down}$

R = take-up rate before shock

SCR.7.54. The capital requirement for the risk of a mass lapse event $Lapse_{mass}$ should be calculated as follows:

$$Lapse_{mass} = \Delta NAV \mid lapseshock_{mass},$$

where

ΔNAV = Change in the net value of assets minus liabilities (not including changes in the risk margin of technical provisions)

$lapseshock_{up}$ = The surrender of 40% of all pension contracts with a positive surrender strain

SCR.7.55. The lapse scenarios should be calculated under the condition that the scenario does not change the value of technical provisions and security mechanisms as a consequence of their loss-absorbing capacity.

SCR.7.56. Additionally, the result of the scenarios should be determined under the condition that the value of technical provisions and security mechanisms can change in response to the shock being tested. The resulting capital requirements are $nPension_{lapse,TP}$ and $nPension_{lapse,SM}$.

Simplifications

Calculation on policy-by-policy basis

SCR.7.57. If it is proportionate to the nature, scale and complexity of the risk, the comparison of surrender value and best estimate provision for the determination of the surrender strain might be made on the level of homogeneous risk groups instead of a member-by-member basis. A calculation on the level of homogeneous risk groups should be considered to be proportionate if

- the homogeneous risk groups appropriately distinguish between policies of different lapse risk; and

- the result of a member-by-member calculation would not differ materially from a calculation on homogeneous risk groups

Factor-based formula for scenario effect

SCR.7.58. A simplified calculation of $Lapse_{down}$ and $Lapse_{up}$ may be made if it is proportionate to nature, scale and complexity of the risk.

SCR.7.59. The simplified calculations are defined as follows:

$$Lapse_{down} = 50\% \cdot l_{down} \cdot n_{down} \cdot S_{down}$$

and

$$Lapse_{up} = 50\% \cdot l_{up} \cdot n_{up} \cdot S_{up} \ ,$$

where

$l_{down}; l_{up}$	=	estimate of the average lapse rate of the policies with a negative/positive surrender strain, restricted in analogy with SCR.7.51.
$n_{down}; n_{up}$	=	average period (in years), weighted by surrender strains, over which the policy with a negative/positive surrender strain runs off
$S_{down}; S_{up}$	=	sum of negative/positive surrender strains

SCR.7.60. The simplified calculation should be done at an appropriate granularity.

Pension$_{exp}$ expense risk

Description

SCR.7.61. Expense risk arises from the variation in the expenses incurred in servicing pension obligations.

Input

SCR.7.62. No specific input data is required for this module.

Output

SCR.7.63. The module delivers the following output:

$Pension_{exp}$	=	Capital requirement for expense risk
$nPension_{exp,\,TP}$	=	Capital requirement for expense risk including the loss-absorbing capacity of technical provisions
$nPension_{exp,\,SM}$	=	Capital requirement for expense risk including the loss-absorbing capacity of security mechanisms

Calculation

SCR.7.64. The capital requirement for expense risk is determined as follows:

$$Pension_{exp} = \Delta NAV \mid expshock$$

where:

ΔNAV	=	Change in the net value of assets minus liabilities
$expshock$	=	Increase of 10% in future expenses compared to best estimate anticipations, and increase by 1% per annum of the expense inflation rate compared to anticipations.

SCR.7.65. An expense payment should not be included in the scenario, if its amount is already fixed at the valuation date (for instance agreed payments of acquisition provisions). For policies with adjustable expense loadings the analysis of the scenario should take into account realistic management actions in relation to the loadings.

SCR.7.66. The expense scenario should be calculated under the condition that the scenario does not change the value of technical provisions and security mechanisms as a consequence of their loss-absorbing capacity.

SCR.7.67. Additionally, the result of the scenario should be determined under the condition that the value of technical provisions and security mechanisms can change in response to the shock being tested. The resulting capital requirements are $nPenison_{exp,TP}$ and $nPension_{exp,SM}$.

Simplification

SCR.7.68. The simplification may be used if it is proportionate to the nature, scale and complexity of the risks that the IORP faces.

SCR.7.69. The simplification is defined as follows:

$$Life_{exp} = 0.1 \cdot n \cdot E + \left(\frac{1}{k} * ((1+k)^n - 1) - \frac{1}{i} * ((1+i)^n - 1) \right) \cdot E$$

where

E = Expenses incurred in servicing life obligations during the last year.

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n = Average period in years over which the risk runs off, weighted by renewal expenses

i = Expected inflation rate (i.e. inflation assumption applied in calculation of best estimate)

k = Stressed inflation rate (i.e. i + 1%)

Pension$_{rev}$ revision risk

Description

SCR.7.70. Revision risk is the risk of loss, or of adverse change in the value of liabilities, resulting from fluctuations in the level, trend, or volatility of revision rates applied to annuities, due to changes in the legal environment or in the state of health of the person insured.

SCR.7.71. This risk module should be applied only to annuities where the benefits payable under the underlying contracts could increase as a result of changes in the legal environment or in the state of health of the person insured.

Input

SCR.7.72. No specific input data is required for this module.

Output

SCR.7.73. The module delivers the following output:

$Pension_{rev}$	=	Capital requirement for revision risk
$nPension_{rev,TP}$	=	Capital requirement for revision risk including the loss absorbing capacity of technical provisions
$nPension_{rev,SM}$	=	Capital requirement for revision risk including the loss absorbing capacity of security mechanisms

Calculation

SCR.7.74. The capital requirement for revision risk is determined as follows:

$$Pension_{rev} = \Delta NAV \mid revshock$$

where:

ΔNAV	=	Change in the net value of assets minus liabilities
$revshock$	=	Increase of 3% in the annual amount payable for annuities exposed to revision risk. The impact should be assessed considering the remaining run-off period of the annuities.

SCR.7.75. The revision risk scenario should be calculated under the condition that the scenario does not change the value of technical provisions and security mechanisms as a consequence of their loss-absorbing capacity.

SCR.7.76. Additionally, the result of the scenario should be determined under the condition that the value of technical provisions and security mechanisms can change in response to the shock being tested. The resulting capital requirements are $nPenison_{rev,TP}$ and $nPension_{rev,SM}$.

Pension$_{CAT}$ catastrophe risk sub-module

Description

SCR.7.77. The catastrophe sub-module is restricted to obligations which are contingent on mortality, i.e. where an increase in mortality leads to an increase in technical provisions.

SCR.7.78. Catastrophe risk stems from extreme or irregular events whose effects are not sufficiently captured in the other pension liability risk sub-modules. Examples could be a pandemic event or a nuclear explosion.

SCR.7.79. Catastrophe risk is mainly associated with products in which an IORP guarantees to make a single or recurring & periodic series of payments when a member or beneficiary dies.

SCR.7.80. Where model points are used for the purposes of calculating the technical provisions and the grouping of the data captures appropriately the mortality risk of the portfolio, each model points can be considered to represent a single policy for the purposes of the sub-module.

Input

SCR.7.81. No specific input data is required for this module.

Output

SCR.7.82. The module delivers the following output:

$Pension_{CAT}$	=	Capital requirement for catastrophe risk
$nPension_{CAT,\ TP}$	=	Capital requirement for catastrophe risk including the loss-absorbing capacity of technical provisions
$nPension_{CAT,\ SM}$	=	Capital requirement for catastrophe risk including the loss-absorbing capacity of security mechanisms

Calculation

SCR.7.83. The capital requirement for catastrophe risk component is defined as follows:

$$Pension_{CAT} = \Delta NAV \mid CAT\ shock$$

where:

ΔNAV	=	Change in the net value of assets minus liabilities
$CAT\ shock$	=	Absolute increase in the rate of members and beneficiaries dying over the following year of 1.5 per mille (only applicable to contracts

which are contingent on mortality)

SCR.7.84. The catastrophe scenario should be calculated under the condition that the scenario does not change the value of technical provisions and security mechanisms as a consequence of their loss absorbing capacity.

SCR.7.85. Additionally, the result of the scenario should be determined under the condition that the value of technical provisions and security mechanisms can change in response to the shock being tested. The resulting capital requirements are $nPension_{CAT,TP}$ and $nPension_{CAT,SM}$.

Simplification

SCR.7.86. The simplification may be used provided that it is proportionate to the nature, scale and complexity of the risks that the IORP faces.

SCR.7.87. The following formula may be used as a simplification for the Life catastrophe risk sub-module:

$$Pension_{CAT} = \sum_i 0.0015 \cdot Capital\_at\_Risk_i$$

where the subscript i denotes each policy where the payment of benefits (either lump sum or multiple payments) is contingent on mortality, and where $Capital\_at\_Risk_i$ is determined as:

$Capital\_at\_Risk_i = SA_i + AB_i \cdot Annuity\_factor - BE_i$

and

BE_i = Best estimate provision (net of (re)insurance) for each policy i

SA_i = For each policy i: where benefits are payable as a single lump sum, the sum assured (net of (re)insurance) on death.

AB_i = For each policy i: where benefits are not payable as a single lump sum, the Annualised amount of Benefit (net of (re)insurance) payable on death or disability.

$Annuity\_factor$ = Average annuity factor for the expected duration over which benefits may be payable in the event of a claim

3.8. Health risk

SCR.8.1. This module delivers the capital requirement SCR_{health} for certain "health benefits" provided by IORPs.

SCR.8.2. Some IORPs in the member states participating in the QIS provide benefits which can be referred to as "health benefits". These may include medical expense insurance obligations, income protection insurance obligations and workers compensation insurance obligations.

SCR.8.3.   For the purpose of this QIS, the following definitions shall apply:

   a) 'health insurance obligation' means an insurance obligation that covers one or both of the following:

      i. the provision of medical treatment or care including preventive or curative medical treatment or care due to illness, accident, disability or infirmity, or financial compensation for such treatment or care,

      ii. financial compensation arising from illness, accident, disability or infirmity;

   b) 'medical expense insurance obligation' means an insurance obligation that covers the provision or financial compensation referred to in point a) i.;

   c) 'income protection insurance obligation' means an insurance obligation that covers the financial compensation referred to in point a) ii. other than the financial compensation referred to in point a) i.;

   d) 'workers compensation insurance obligation' means an insurance obligation that covers the provision or financial compensation referred to in points a) i. and ii. and which relates only to accidents at work, industrial injury and occupational disease;

SCR.8.4.   These benefits may include health insurance obligations pursued on a similar technical basis to that of life insurance (SLT Health) as well as health insurance obligations not pursued on a similar technical basis to that of life insurance (Non-SLT Health).

SCR.8.5.   While the risks stemming from income protection insurance obligations of IORPs are usually covered by the disability/morbidity sub-module of the pension liability risk module (see SCR.7.34 ff), for some health benefit obligations of IORPs this may not be appropriate.

SCR.8.6.   For the purpose of this QIS, IORPs which provide such benefits should calculate the SCR for the respective health benefit obligations as follows:

$$SCR_{health} = 4 \cdot \sum_{s} (\alpha_s \cdot TP_s + \beta_s \cdot P_s)$$

SCR.8.7.   For definitions of α_s, TP_s, β_s and P_s see Chapter 4 on MCR below.

3.9. Financial Risk mitigation

Scope

SCR.9.1   This subsection covers financial risk mitigation techniques. For the purposes of this QIS, financial risk mitigation techniques include the purchase or issuance of financial instruments (such as financial derivatives) which transfer risk to the financial markets.

SCR.9.2   The use of special purpose vehicles and (re)insurance to mitigate pension liability and health risks are not considered to be financial risk mitigation techniques and are covered in section 3.10.

SCR.9.3   The following are examples of financial risk mitigation techniques covered by this subsection:

- Interest rate swaps to cover the risk of lower interest rates,

- Currency swaps and forwards to cover currency risk in relation to assets or liabilities,

- Put options bought to cover the risk of falls in assets,

- Protection bought through credit derivatives or collateral to cover the risk of failure or downgrade in the credit quality of certain exposures,

- Swaptions acquired to cover variable/fixed risks.

SCR.9.4   The allowance of the above financial risk mitigation techniques is subject to the requirements in this subsection and the principles in Annex 4 being met.

SCR.9.5   Financial risk mitigation techniques do not include the risk mitigating effect provided by pure conditional, pure discretionary and mixed benefits. Processes and controls that an IORP has in place to manage the investment risk are also excluded. This does not preclude the allowance for future management actions in the calculation of technical provisions subject to the requirements in HBS.3.22 ff.

Conditions for using financial risk mitigation techniques

SCR.9.6   The risk mitigation technique must be legally effective and enforceable in all relevant jurisdictions and there must be an effective transfer of risk to a third party.

SCR.9.7   IORPs should have a direct claim on the protection provider and there should be an explicit reference to specific exposures or a pool of exposures, so that the extent of the cover is clearly defined and incontrovertible.

SCR.9.8   The calculation of the SCR using the standard formula should allow for the effects of financial risk mitigation techniques through a reduction in requirements commensurate with the extent of risk mitigation and an

appropriate treatment of any corresponding risks embedded in the use of financial risk mitigation techniques. These two effects should be separated.

SCR.9.9 There should be no double counting of mitigation effects.

SCR.9.10 All material risks arising from the use of the financial risk mitigation techniques should be reflected in the SCR, regardless of whether that financial risk mitigation technique is considered admissible.

SCR.9.11 The calculation should be made on the basis of assets and liabilities existing at the date of reference of the solvency assessment.

SCR.9.12 With the exception of rolling hedging programmes, see below, risk mitigation techniques (for example financial stop-loss processes) not in place at the date of reference of the solvency assessment should not be allowed to reduce the calculation of the SCR with the standard formula.

Basis Risk

SCR.9.13 Where the underlying assets or references of the financial mitigation instrument do not perfectly match the exposures of the IORP, the financial risk mitigation technique should only be allowed in the calculation of the SCR with the standard formula if the IORP can demonstrate that the basis risk is either not material compared to the mitigation effect or, if the risk is material, that the basis risk can be appropriately reflected in the SCR.

SCR.9.14 The following 'financial risk mitigation techniques' should be considered to involve material basis risk:
- equity derivatives whose underlying equities or indexes have not a correlation nearby 1 with the hedged asset or liability, especially in case of stressed situations.
- CDS referred to names different than the hedged name, or with a correlation not nearby 1, with a different tenor or a different nominal.

Shared financial risk mitigation

SCR.9.15 Shared financial risk mitigation techniques which provide simultaneous protection to various parties and where the activation of one of them means the loss of protection (totally or partially) for the rest of parties should not be treated as a financial risk mitigation technique in this QIS.

Rolling and dynamic hedging

SCR.9.16 Where a risk mitigation technique covers just a part of the next twelve months it should only be allowed with the average protection level over the next year (i.e. pro rata temporis).

For example, where an equity option provides protection for the next six months, IORPs should assume that the option only provides half of the risk mitigating effect that it does if the shock takes place immediately.

Where the exposure to the risk that is being hedged will cease before the end of the next year with objective certainty, the same principle should be applied but in relation to the full term of the exposure.

SCR.9.17 Where a risk mitigation technique covers only a part of the next twelve months, but a rolling hedge programme exists, this should be permitted as a risk mitigation technique if the following conditions are met:

a. There is well-documented and established process for the rolling forward of hedges;

b. The risk that the hedge cannot be rolled over due to an absence of liquidity in the market is not material (no material liquidity risk);

c. The costs of renewing the same hedge over a one year period are reflected in the SCR calculation by reducing the level of protection of the hedge; and

d. Any additional counterparty risk that arises from the rolling over of the hedge is reflected in the SCR.

SCR.9.18 Dynamic hedging should not be treated as a risk mitigation technique.

Credit quality of the counterparty

SCR.9.19 For purposes of this QIS, only financial protection provided by counterparties with a credit rating equal or equivalent to at least BBB should be allowed in the assessment of the SCR. For unrated counterparties, the IORP should be able to demonstrate that the counterparty meets at least the standard of a BBB rated company.

SCR.9.20 In the event of default, insolvency or bankruptcy of the provider of the financial risk mitigation instrument – or other credit events set out in the transaction document – the financial risk mitigation instrument should be capable of liquidation in a timely manner or retention.

SCR.9.21 Where a provider of protection was downgraded below BBB or became unrated at the end of 2011, but its rating was restored in 2012, the financial mitigation technique may be considered admissible for this QIS purposes.

SCR.9.22 If the financial risk mitigation technique is collateralized, the assessment of the credit quality of the protection should consider the collateral if the requirements set out below are met and the risks arising from the collateral are appropriately captured in the SCR (i.e. the counterparty default risk module).

Credit derivatives

SCR.9.23 The reduction of the SCR based on the mitigation of credit exposures by using credit derivatives should only be allowed where IORPs have in force generally applied procedures for this purpose and consider generally admitted criteria. Requirements set out in other financial sectors for the

same mitigation techniques may be considered as generally applied procedures and admitted criteria.

SCR.9.24 In order for a credit derivative contract to be recognised, the credit events specified by the contracting parties must at least cover:

- Failure to pay the amounts due under the terms of the underlying obligation that are in effect at the time of such failure (with a grace period that is closely in line with the grace period in the underlying obligation);

- Bankruptcy, insolvency or inability of the obligor to pay its debts, or its failure or admission in writing of its inability generally to pay its debts as they fall due, and analogous events; and

- Restructuring of the underlying obligation, involving forgiveness or postponement of principal, interest or fees that results in a credit loss event.

SCR.9.25 In the event that the credit events specified under the credit derivative do not include restructuring of the underlying obligation, the protection offered by the risk-mitigation technique may be partially recognised as follows:

- where the amount that the protection provider has undertaken to pay is not higher than the exposure value, the value of the credit protection should be reduced by 40%; or

- where the amount that the protection provider has undertaken to pay is higher than the exposure value, the value of the credit protection should be no higher than 60% of the exposure value.

SCR.9.26 Where the amount that the protection provider has undertaken to pay is higher than the exposure value then IORP should provide further information on the nature of the risk mitigation technique.

SCR.9.27 A mismatch between the underlying obligation and the reference obligation under the credit derivative or between the underlying obligation and the obligation used for purposes of determining whether a credit event has occurred is permissible only if the following conditions are met:

- the reference obligation or the obligation used for the purposes of determining whether a credit event has occurred, as the case may be, ranks pari passu with or is junior to the underlying obligation; and

- the underlying obligation and the reference obligation or the obligation used for the purposes of determining whether a credit event has occurred, as the case may be, share the same obligor (i.e. the same legal entity) and there are in place legally enforceable cross-default or cross-acceleration clauses.

Collateral

SCR.9.28 A collateralized transaction is a transaction in which an IORP has a credit exposure or potential credit exposure which is hedged in whole or in part

by collateral posted by a counterparty or by a third party on behalf of the counterparty.

SCR.9.29   The legal mechanism by which collateral is pledged or transferred should ensure that the IORP has the right to liquidate or take legal possession of the collateral, in a timely manner, in case of any default event related to the counterparty.

SCR.9.30   Where applicable, the legal mechanism by which collateral is pledged or transferred should ensure that the IORP has the right to liquidate or take possession of the collateral, in a timely manner, in case of any default event related to a third party custodian holding the collateral.

Segregation of assets

SCR.9.31   Where the liabilities of the counterparty are covered by strictly segregated assets under arrangements that ensure the same degree of protection as collateral arrangements then the segregated assets should be treated as if they were collateral with an independent custodian.

SCR.9.32   The segregated assets should be held with a deposit-taking institution with a credit rating equal or equivalent to at least BBB.

SCR.9.33   The segregated assets should be individually identifiable and should only be changed subject to the consent of the IORP.

SCR.9.34   The IORP should have a right in rem on the segregated assets and the right to directly obtain ownership of the assets without any restriction, delay or impediment in the event of the default, insolvency or bankruptcy of the counterparty or other credit event set out in the transaction documentation.

3.10. Insurance risk mitigation

Scope

SCR.10.1.   This subsection covers insurance risk mitigation techniques. For the purposes of this QIS, insurance risk mitigation techniques include the use of insurance and reinsurance contracts or special purpose vehicles to transfer pension liability and health risks.

Conditions for using insurance risk mitigation techniques

SCR.10.2.   The risk mitigation technique must be legally effective and enforceable in all relevant jurisdictions and there must be an effective transfer of risk to a third party.

SCR.10.3.   The mere fact that the probability of a significant variation in either the amount or timing of payments by the reinsurer is remote does not by itself mean that the reinsurer has not assumed risk.

SCR.10.4.   The calculation of the SCR using the standard formula should allow for the effects of insurance risk mitigation techniques through a reduction in requirements commensurate with the extent of risk mitigation and an appropriate treatment of any corresponding risks embedded in the use of insurance risk mitigation techniques. These two effects should be separated.

SCR.10.5.   There should be no double counting of risk mitigation effects.

SCR.10.6.   All material risks arising from the use of the insurance risk mitigation should be reflected in the SCR, regardless of whether that insurance risk mitigation technique is considered admissible.

SCR.10.7.   The allowance of insurance risk mitigation techniques is subject to the requirements in this subsection and the principles in Annex 4 being met.

Basis Risk

SCR.10.8.   When an insurance risk mitigation technique includes basis risk (for example as might happen where payments are made according to external indicators rather than directly related to losses) the insurance risk mitigation instruments should only be allowed in the calculation of the SCR with the standard formula if the IORP can demonstrate that the basis risk is either not material compared to the mitigation effect or if the risk is material that the basis risk can be appropriately reflected in the SCR.

Credit quality of the counterparty

SCR.10.9.   For the purposes of this QIS, providers of insurance risk mitigation should meet the following requirements:
  • (Re)insurance entities should meet their current capital requirements or have a credit rating equal or equivalent to at least BBB

- EEA SPVs that are currently authorised should meet the requirements set out in the national law of the Member States in which they are authorised
- Non-EEA SPVs should fully fund their exposure to the risks assumed from the IORP through the proceeds of a debt issuance or other financing mechanism and the repayments rights of the providers of such debt or financing mechanism should be subordinated to the (re)insurance obligations of the IORP

The assessment of the above should be based on the latest available information, which should be no more than 12 months old.

SCR.10.10. Notwithstanding the above, to the extent that collateral, meeting the requirements in section 3.9 has been provided, the (re)insurance should be recognised up to the amount of the collateral.

SCR.10.11. Risk mitigation may be used to mitigate the credit risk arising from (re)insurance counterparties, subject to the requirements in section 3.9 being met.

4. Minimum Capital Requirement

4.1. Introduction

MCR.1.1   This section provides instructions for calculating the Minimum Capital Requirement (MCR) of the IORP. The calculation of the MCR combines a linear formula with a floor of 25% and a cap of 45% of the SCR.

4.2. Overall MCR calculation

Input

MCR.2.1   The following input information is required:

MCR_{Linear} =   the linear formula component for IORP obligations

SCR =   the SCR of the IORP

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Output

MCR.2.2   The calculation delivers the following output:

MCR the Minimum Capital Requirement of the IORP

MCR.2.3   The following intermediate output is also calculated:

MCR_{Linear} =   the linear formula, whose calculation is further detailed below.

Calculation

MCR.2.4   The MCR of the IORP is calculated as follows:

$$MCR = \{\min[\max(MCR_{linear}; 0.25 \cdot SCR); 0.45 \cdot SCR]\}$$

Input

MCR.2.5   The following input information is required:

TP_1 denotes the technical provisions without a risk margin in relation to guaranteed benefits for IORP obligations with profit participation, after deduction of the amounts recoverable from (re)insurance contracts and special purpose vehicles, with a floor equal to zero, and technical provisions without a risk margin for

TP_1	(re)insurance obligations where the underlying IORP obligations include profit participation, after deduction of the amounts recoverable from (re)insurance contracts and special purpose vehicles, with a floor equal to zero;
TP_2	denotes the technical provisions without a risk margin in relation to future discretionary benefits for IORP obligations with profit participation, after deduction of the amounts recoverable from (re)insurance contracts and special purpose vehicles, with a floor equal to zero;
TP_3	denotes the technical provisions without a risk margin for IORP obligations where the investment risk is borne by members and beneficiaries after deduction of the amounts recoverable from (re)insurance contracts and special purpose vehicles, with a floor equal to zero;
TP_4	denotes the technical provisions without a risk margin for all other IORP obligations, with the exception of those referring to benefits which are considered in the health risk sub-module, after deduction of the amounts recoverable from (re)insurance contracts and special purpose vehicles, with a floor equal to zero;
CAR	denotes the total capital at risk, being the sum, in relation to each contract that gives rise to IORP obligations, of the capital at risk of the contracts.

Health

TP_S	denotes the technical provisions without a risk margin in the segment s (see table below), for those benefits which are considered in the health risk sub-module, after deduction of the amounts recoverable from (re)insurance contracts and special purpose vehicles, with a floor equal to zero;
P_s	denotes the premiums written in the segment s (see table below), for those benefits which are considered in the health risk sub-module, during the last 12 months, after deduction of premiums for (re)insurance contracts, with a floor equal to zero;

MCR.2.6   Technical provisions after deduction of the amounts recoverable from (re)insurance contracts and special purpose vehicles referred to in MCR.2.5 shall be taken to exclude deduction of the amounts recoverable from (re)insurance contracts or special purpose vehicles that do not meet the requirements set out in section 3.10 (insurance risk mitigation) and Annex 4.

MCR.2.7   Premiums written after deduction of premiums for (re)insurance contracts referred to in MCR.2.5 shall exclude the deduction of premiums associated with (re)insurance contracts that do not meet the requirements set out in section 3.10 (insurance risk mitigation) and Annex 4.

Output

MCR.2.8   The calculation delivers the following output:

MCR_{linear} =   the linear formula component for IORP

Calculation

MCR.2.9   The linear formula component MCR$_{Linear}$ is calculated by the following formula:

$$MCR_{Linear} = 0.05 \cdot TP_1 - 0.088 \cdot TP_2 + 0.005 \cdot TP_3 + 0.029 \cdot TP_4 + 0.001 \cdot CAR + \sum_s (\alpha_s \cdot TP_S + \beta_s \cdot P_s)$$

where:

- the sum covers all segments set out in the table below;
- the factors α_s and β_s are set out in the table below

Segment	Factor for technical provisions for segment s (a_s)	Factor for premiums written for segment s (β_s)
Medical expense insurance	4.7 %	4.7 %
Income protection insurance	13.1 %	8.5 %
Workers' compensation insurance	10.7 %	7.5 %

5.   Proportionality

5.1. Introduction

PRO.1.1.   This chapter aims at providing an assessment on the way proportionality should be approached in the context of the valuation of the holistic balance sheet and the use of simplifications in the SCR standard formula to ensure that the applied approaches are proportionate to the nature, scale and complexity of the underlying risks.

5.2. Requirements for application of proportionality principle

Selection of valuation methodology and SCR simplifications

PRO.2.1.   The principle of proportionality requires that the IORP should be allowed to choose and apply a valuation method or a simplified calculation in the SCR standard formula which is:

  • suitable to achieve the objective; but

  • not more sophisticated than is needed in order to reach this objective (proportionate to the nature, scale and complexity of the risks).

PRO.2.2.   This does however not mean that an application of the principle of proportionality is restricted to small and medium-sized IORPs, nor does it mean that size is the only relevant factor when the principle is considered. Instead, the individual risk profile should be the primary guide in assessing the need to apply the proportionality principle.

Estimation uncertainty and its link to proportionality

PRO.2.3.   Due to the uncertainty of future events, any "modelling" of future cash flows (implicitly or explicitly contained in the valuation methodology) or standard scenarios in the SCR will necessarily be imperfect, leading to a certain degree of inaccuracy and imprecision in the measurement. Where simplified approaches are used to value the holistic balance sheet or to calculate the SCR, this could potentially introduce additional uncertainty (or model error). With regard to the principle of proportionality, it is important to assess the model error that results from the use of a given valuation technique.

Simplified methods

PRO.2.4.   The term "simplified method" would refer to a situation where a specific valuation technique or calculation in the SCR has been simplified, in line with the proportionality principle. In a loose sense, the term "simplified method" (or "simplification") could also be used to refer to a method which

is considered to be simpler than a "commonly used" benchmark or reference method.

Approximations

PRO.2.5.   Where approximation techniques are applied, these would typically be based on a fixed set of assumptions and would tend to be less complex than techniques which carry out explicit cash flow projections based on IORP-specific data. Therefore, approximations may often be regarded as a specific kind of simplified methods (where the simplification is due to a lack of data). The use of expert judgement plays a key role in this context.

Role of simplified methods in the valuation and SCR standard formula framework

PRO.2.6.   The principle of proportionality applies generally when a valuation methodology or SCR calculation is chosen, allowing IORPs the flexibility to select an approach which is proportionate to the nature, scale and complexity of the underlying risks:

5.3. Proportionality assessment – a three step process

PRO.3.1.   It would be appropriate for such an assessment to include the following three steps:

   Step 1: Assess the nature, scale and complexity of underlying risks;

   Step 2: Check whether valuation methodology or SCR calculation is proportionate to risks as assessed in step 1, having regard to the degree of model error resulting from its application;

   Step 3: Back test and validate the assessments carried out in steps 1 and 2.

PRO.3.2.   However – due to the restricted time frame – Step 3 is omitted for the purpose of the QIS exercise.

Step 1: Assess the nature, scale and complexity of risks

PRO.3.3.   In this step, IORPs should assess the nature, scale and complexity of the risks. This is intended to provide a basis for checking the appropriateness of specific valuation methods and standard formula calculations carried out in step two and should serve as a guide to identify where simplified methods are likely to be appropriate.

Which risks?

PRO.3.4.   The scope of risks which should be included in the analysis will depend on the purpose and context of the assessment. For the purpose of calculating technical provisions, the assessment should include all risks which materially affect (directly or indirectly) the amount or timing of cash flows required to settle the pension obligations arising from the pension contracts in the portfolio to be valued. For the purpose of calculating the

SCR, the assessment should include all risks that are relevant for the risk module under considerations.

Nature and complexity

PRO.3.5.   Nature and complexity of risks are closely related and, for the purposes of an assessment of proportionality, could best be characterised together. Indeed, complexity could be seen as an integral part of the nature of risks, which is a broader concept.

PRO.3.6.   In mathematical terms, the nature of the risks underlying the pension schemes could be described by the probability distribution of the future cash flows arising from the schemes. This encompasses the following characteristics:

- the degree of homogeneity of the risks;

- the variety of different sub-risks or risk components of which the risk is comprised;

- the way in which these sub-risks are interrelated with one another;

- the level of certainty, i.e. the extent to which future cash flows can be predicted;

- the nature of the occurrence or crystallisation of the risk in terms of frequency and severity;

- the type of the development of claims payments over time;

- the extent of potential members/beneficiaries loss, especially in the tail of the claims distribution.

PRO.3.7.   The first three bullet points in the previous paragraph are in particular related to the complexity of risks generated by the pension schemes, which in general terms can be described as the quality of being intricate (i.e. of being "entwined" in such a way that it is difficult to separate them) and compounded (i.e. comprising a number of different sub-risks or characteristics).

PRO.3.8.   IORPs should also seek to identify factors which would indicate the presence of more complex and/or less predictable risks. This would be the case, for example, where:

- the cash-flows are highly path dependent; or

- there are significant non-linear inter-dependencies between several drivers of uncertainty; or

- the cash-flows are materially affected by the potential future management actions; or

- risks have a significant asymmetric impact on the value of the cash-flows, in particular if contracts include material embedded options and guarantees; or

- the value of options and guarantees is affected by the members/beneficiaries or sponsor behavior assumed in the model; or

- IORPs use a complex risk mitigation instrument, for example a complex non-proportional (re)insurance structure; or

- a variety of covers of different nature are bundled in the pension schemes; or

- the terms of the pension schemes are complex; or

- IORPs invest in complex structured securities.

PRO.3.9.   The degree of complexity and/or uncertainty of the risks are/is associated with the level of calculation sophistication and/or level of expertise needed to carry out the valuation. In general, the more complex the risk, the more difficult it will be to model and predict the future cash flows required to settle the obligations arising from the pension portfolio.

Scale

PRO.3.10. Assigning a scale introduces a distinction between "small" and "large" risks. IORPs may use a measurement of scale to identify sub-risks where the use of simplified methods would likely be appropriate, provided this is also commensurate with the nature and complexity of the risks.

PRO.3.11. For example, where IORPs assess that the impact of inflation risk on the overall risk profile of the portfolio is small, they may consider that an explicit recognition of inflation scenarios would not be necessary. A scale criterion may also be used, for example, where the pension schemes to be measured are segmented. In such a case, the relative scale of the different segments in relation to the total number of pension schemes could be considered.

PRO.3.12. Related to this, a measurement of scale may also be used to introduce a distinction between material and non-material risks. Introducing materiality in this context would provide a threshold or cut-off point below which it would be regarded as justifiable to omit (or not explicitly recognise) certain risks. For example, where IORPs assess that the exposure to a particular risk is negligible, they may decide not to calculate the stress scenario in the SCR related to that risk.

PRO.3.13. To measure the scale of risks, further than introducing an absolute quantification of the risks, IORPs will also need to establish a benchmark or reference volume which leads to a relative rather than an absolute assessment. In this way, risks may be considered "small" or "large" relative to the established benchmark. Such a benchmark may be defined, for example, in terms of a volume measure such as contributions or technical provisions that serves as an approximation for the risk exposure.

Combination of the three indicators and overall assessment

PRO.3.14. The three indicators - nature, scale and complexity - are strongly interrelated, and in assessing the risks the focus should be on the combination of all three factors. This overall assessment of proportionality would ideally be more qualitative than quantitative, and cannot be reduced to a simple formulaic aggregation of isolated assessments of each of the indicators.

PRO.3.15. In terms of nature and complexity, the assessment should seek to identify the main qualities and characteristics of the risks, and should lead to an evaluation of the degree of their complexity and predictability. In combination with the "scale" criterion, IORPs may use such an assessment as a "filter" to decide whether the use of simplified methods would be likely to be appropriate. For this purpose, it may be helpful to broadly categorise the risks according to the two dimensions "scale" and "complexity/predictability".

PRO.3.16. An assessment of nature, scale and complexity may thus provide a useful basis for the second step of the proportionality process where it is decided whether a specific valuation methodology or standard formula calculation would be proportionate to the underlying risks.

Step 2: Assessment of the model error

PRO.3.17. This means that a given valuation technique for the best estimate of technical provisions or sponsor support should be seen as proportionate if the resulting estimate is not expected to diverge materially from the "true" best estimate which is given by the mean of the underlying risk distribution, i.e. if the model error implied by the measurement is immaterial. For the SCR standard formula, it means that a simplified calculation should be regarded a proportionate if the resulting model error is expected to be non-material. This ensures that the simplification is suitable to achieve the calibration objective of the SCR and that the IORP can rely on the estimation.

PRO.3.18. Where several methods turn out to be proportionate, IORPs would be expected to select and apply the method which is most appropriate in relation to the underlying risks.

Materiality in the context of valuation and SCR calculation

PRO.3.19. In order to clarify the meaning of materiality IORPs should use the following definition:

"An error, an information, etc. is material if itself or its omission or misstatement leads to a misstatement of the holistic balance sheet or solvency position that could influence the decision-making or the judgement of the user of the information."

PRO.3.20. When determining how to address materiality, IORPs should have regard to the purpose of the work and its intended users. For a quantitative assessment of risk for solvency purposes this should include the supervisory authority. IORPs may adjust their assessment of materiality to the particular situation of a QIS exercise which usually requires a lower degree of accuracy than financial and supervisory reporting.

Assessment of the estimation uncertainty

PRO.3.21. Regardless of what methods should be applied for the valuation of the holistic balance sheet or the calculation of the SCR, it is important that an assessment of their appropriateness should in general include an assessment of the model error implicit to the calculations.

PRO.3.22. Such an assessment may be carried out by expert judgement or by more sophisticated approaches, for example:

- Sensitivity analysis in the framework of the applied model: this means to vary the parameters and/or the data thereby observing the range where a best estimate might be located.

- Comparison with the results of other methods: applying different methods gives insight in potential model errors. These methods would not necessarily need to be more complex.

- Descriptive statistics: in some cases the applied model allows the derivation of descriptive statistics on the estimation error contained in the estimation. Such information may assist in quantitatively describing the sources of uncertainty.

- Back-testing: comparing the results of the estimation against experience may help to identify systemic deviations which are due to deficiencies in the modelling.

PRO.3.23. IORPs are not required to quantify the degree of model error in quantitative terms, or to re-calculate the value of the components of the holistic balance sheet or the value of the solvency capital requirement 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 a QIS exercise which usually requires a lower degree of accuracy than financial and supervisory reporting may be taken into account in the assessment.

Approach in cases

PRO.3.24. Where the intended use of a valuation technique or SCR calculation is expected to lead to a material degree of model error, IORPs should consider which alternative techniques would be available. Where

practicable, another more appropriate valuation method or standard formula calculation should be applied.

PRO.3.25. In some circumstances, however, it may be unavoidable for IORPs to apply a method which leads to an increased level of estimation uncertainty. This would be the case where IORPs, to carry out a valuation, would need to make assumptions which are uncertain or conjectural and which cannot be validated. For example, this could be the case where there are deficiencies in the data, so that there is only insufficient pertinent past experience data available to derive or validate assumptions.

PRO.3.26. Under these circumstances, it would be acceptable for IORPs to apply a technique which carries an increased level of estimation uncertainty or model error. IORPs should document that this is the case and consider the implications of the increased level of uncertainty with regard to the reliability of the valuation and their overall solvency position.

PRO.3.27. In particular, IORPs should assess whether the increased level of estimation uncertainty is adequately addressed in the determination of the SCR and the setting of the risk margin in the technical provision.

PRO.3.28. Where the use of a valuation technique results in a material increase in the level of uncertainty associated with a particular component on the holistic balance sheet, IORPs should include a degree of caution in the judgements needed in setting the assumptions and parameters underlying the valuation. However, this exercise of caution should not lead to a deliberate overstatement of the best estimate or understatement of sponsor support. To avoid a double-counting of risks, the valuation of holistic balance sheet should be free of bias and should not contain any additional margin of prudence.

5.4. Possible simplifications

Best estimate of technical provisions

Biometric risk factors

PRO.4.1. 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.

PRO.4.2. 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 analyze biometric risk factors;

- apply current tables in use adjusted by a suitable multiplier function. The construction of reliable mortality, morbidity/ disability tables and the modeling 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

PRO.4.3.   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

PRO.4.4.   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

PRO.4.5.   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 pure conditional, pure discretionary and mixed benefits

PRO.4.6.   Possible simplifications for determining the future pure conditional, pure discretionary and mixed benefits may include, where appropriate, the

assumption that economic conditions will follow a certain pattern, not necessarily stochastic, appropriately assessed.

Expenses and other charges

A) Expenses

PRO.4.7.   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.

B) Other charges

PRO.4.8.   The possible simplification for other charges is to assume that:

- other charges are a constant share of?; or
- a constant charge (in relative terms) from the …?.

Cash-flows and term structure

PRO.4.9.   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

PRO.4.10.   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.

PRO.4.11.   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.

PRO.4.12.   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.

PRO.4.13.   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 mechanisms

PRO.4.14. 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.

Recoverables from (re)insurance contracts

PRO.4.15. 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.

PRO.4.16. The result from the calculation should be adjusted to take account of the expected losses due to the default of the counterparty.

SCR standard formula

PRO.4.17. Possible simplifications in the calculation of the solvency capital requirement include:

- The specific simplifications proposed in the technical specifications with regard to spread risk on bonds, counterparty default risk, mortality risk, longevity risk and expense risk.

- Further simplifications, if appropriate, which includes not calculating a stress for a particular risk when the exposure to that risk is considered to be negligible by the IORP.

Annex 1 – Stochastic simplification valuation sponsor support

This annex explains and derives the formulas for Simplification 1 – Stochastic valuation of sponsor support in Section 2.6.

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 sold to pay the pensions).

This probability distribution is supposed to be Gaussian, with a mean value which is equal to the current estimated underfunding (technical provisions – "hard" assets), and a standard deviation derived from the standard deviation of assets, the standard deviation of liabilities, and the linear correlation between assets and liabilities.

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 derived 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

These cap and floor result in an adjustment to the mean value of the probability distribution; in the formulas below this adjustment is referred to as Adj_{exp}. It can be noted that this adjustment will differ according to the application or not of the 0 floor.

Step 3: calculation of the expected value of support received from the sponsor, without accounting for the default probability of the sponsor.

This expected value (referred to as SS_{exp} in the formulas) is obtained by adding the adjustment Adj_{exp} to the mean value of the underfunding probability distribution derived in Step 1.

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.

The basic assumption here is the following: if the expected global amount of sponsor support is SS_{exp}, the sponsor will pay each year an additional contribution of $\frac{SS_{exp}}{d}$, for d years.
Moreover, we consider that:
- o The sponsor has a constant probability of default p_{def} each year
- o If the sponsor defaults at time t, the IORP will get 100% of the payments due before t, and x% of the payments due after t, where x denotes the recovery rate on the sponsor.

Under such assumptions, we can derive an adjustment factor Adj_{def} (equal to 1 if the default probability of the sponsor is 0, or the recovery rate is 100%) to be applied to SS_{exp} in order to derive the final expected value of sponsor support.

Implementation of the method

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 value of the sponsor support to the IORP is given by the following formula.

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

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 respectively denote the cumulative and non-cumulative Gaussian distribution functions with average 0 and variance 1.

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}:

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

Calculation of Adj_{exp}

N.B.: unless otherwise stated, the symbols have the same meaning as in the draft technical specifications.

Basic assumption: the vector (A, TP) is normally distributed, with mean $\begin{pmatrix} \mu_A \\ \mu_{TP} \end{pmatrix}$ and

covariance matrix $\begin{pmatrix} \mu_A^2 \sigma_A^2 & \rho \mu_A \mu_{TP} \sigma_A \sigma_{TP} \\ \rho \mu_A \mu_{TP} \sigma_A \sigma_{TP} & \mu_{TP}^2 \sigma_{TP}^2 \end{pmatrix}$

Under this assumption, the underfunding $SS = TP - A$ is normally distributed, with:
-   mean $\mu_{SS} = \mu_{TP} - \mu_A$
-   standard deviation $\sigma_{SS} = \sqrt{\mu_A^2 \sigma_A^2 + \mu_{TP}^2 \sigma_{TP}^2 + 2\rho \mu_A \mu_{TP} \sigma_A \sigma_{TP}}$

N.B.: in all the following equations, the terms μ_{SS} and σ_{SS} will be respectively denoted μ and σ, in order to alleviate the formulas.

Let's consider the following random variables:
-   $\overline{SS} = min(M_{SS}, max(0, SS))$
-   $\overline{\overline{SS}} = min(M_{SS}, SS)$

The variable $\overline{SS}$ corresponds to the case where the sponsor cannot withdraw assets nor reduce contributions to the IORP in case of overfunding, and the variable $\overline{\overline{SS}}$ corresponds to the case where the sponsor can withdraw assets or reduce contributions to the IORP.

In each case, we define Adj_{exp} as the difference between $E[\overline{SS}]$ (resp. $E[\overline{\overline{SS}}]$) and μ_{SS}.

Let's calculate the value of $E[\overline{SS}] - \mu_{SS}$.

The density function of $\overline{SS}$ is:
$$f_{\overline{SS}}(x) = P[SS \le 0]\delta_0 + I_{]0, M_{SS}[} \varphi_{\mu, \sigma}(x) + P[SS \ge M_{SS}]\delta_{M_{SS}}$$
where δ is the Dirac function, I is an indicator function, and $\varphi_{\mu, \sigma}(x)$ is the density of a Gaussian variable with mean μ and standard deviation σ.

Therefore we have:
$$E[\overline{SS}] = \int_0^{M_{SS}} x\, \varphi_{\mu, \sigma}(x)dx + M_{SS}\left(1 - \phi\left(\frac{M_{SS} - \mu}{\sigma}\right)\right)$$
$$= \mu_{SS} - \int_{-\infty}^0 x\, \varphi_{\mu, \sigma}(x)dx - \int_{M_{SS}}^{+\infty} x\, \varphi_{\mu, \sigma}(x)dx + M_{SS}\left(1 - \phi\left(\frac{M_{SS} - \mu}{\sigma}\right)\right)$$
where ϕ is the cumulative distribution function of a gaussian of mean 0 and variance 1.

Using the following result:
$$\int_a^b x\, \varphi_{\mu, \sigma}(x)dx = \mu\left[\phi\left(\frac{b - \mu}{\sigma}\right) - \phi\left(\frac{a - \mu}{\sigma}\right)\right] - \sigma\left[\varphi\left(\frac{b - \mu}{\sigma}\right) - \varphi\left(\frac{a - \mu}{\sigma}\right)\right]$$
we show that:
$$\int_{-\infty}^0 x\, \varphi_{\mu, \sigma}(x)dx = \mu\phi\left(-\frac{\mu}{\sigma}\right) - \sigma\varphi\left(-\frac{\mu}{\sigma}\right)$$
and
$$\int_{M_{SS}}^{+\infty} x\, \varphi_{\mu, \sigma}(x)dx = \mu\left(1 - \phi\left(\frac{M_{SS} - \mu}{\sigma}\right)\right) + \sigma\varphi\left(\frac{M_{SS} - \mu}{\sigma}\right)$$

Hence we finally have:

$$Adj_{exp} = E[\overline{SS}] - \mu_{SS}$$

$$= -\left[\mu\phi\left(-\frac{\mu}{\sigma}\right) - \sigma\varphi\left(-\frac{\mu}{\sigma}\right)\right] - \left[(\mu - M_{SS})\left(1 - \phi\left(\frac{M_{SS} - \mu}{\sigma}\right)\right) + \sigma\varphi\left(\frac{M_{SS} - \mu}{\sigma}\right)\right]$$

The first term of this sum corresponds to the left-hand adjustment of the distribution due to the floor at 0, and the second term corresponds to the right-hand adjustment due to the cap at M_{SS}.

The reasoning for $E[\overline{SS}] - \mu_{SS}$ is exactly similar, but considering only the right-hand adjustment.

Calculation of Adj_{def}

Basic assumptions:
- The sponsor has a constant annual probability of default p
- The sponsor will provide to the IORP constant payments of $\frac{E[\overline{SS}]}{d}$ each year for d years
- In case of default of the sponsor at date t, the IORP will recover α (recovery rate) times the payments still to me made on t and after.

Considering that, under these assumptions, the probability that in year t the sponsor has not yet defaulted is $(1-p)^t$, we have the following formula for the probability weighted cash flow in year t:

$$CF_t = \frac{E[\overline{SS}]}{d}(1-p)^t + \alpha\frac{E[\overline{SS}]}{d}(1 - (1-p)^t)$$

Hence the value of sponsor support, adjusted for the probability of default of the sponsor in the future, is:

$$\sum_{t=1}^{d} CF_t = (1-p)\frac{E[\overline{SS}]}{d}\frac{1 - (1-p)^d}{p}(1-\alpha) + \alpha E[\overline{SS}]$$

$$= E[\overline{SS}].\frac{1}{d}\left[d\alpha + (1-\alpha)(1-p)\frac{1 - (1-p)^d}{p}\right]$$

The multiplicative adjustment to be applied to $E[\overline{SS}]$ in order to capture the effect of possible default of the sponsor is finally:

$$Adj_{def} = \frac{1}{d}\left[d\alpha + (1-\alpha)(1-p)\frac{1 - (1-p)^d}{p}\right]$$

Annex 2 – Matching premium

Part 1 - Application of the matching premium

1. The risk-free rate interest rates to calculate the best estimate of a portfolio of pension obligations shall include a matching premium, determined in accordance with Part 2 ("Calculation of the matching premium"), provided that the following conditions relating to the pension obligations and the assets covering them are met:

   a) the IORP has assigned a portfolio of assets, consisting of bonds and other assets with similar cash-flow characteristics, to cover the best estimate of the portfolio of pension obligations and intends to maintain this assignment over the lifetime of the obligations, except for the purpose of maintaining the replication of cash-flows between assets and liabilities where the expected cash-flows have materially changed such as the default of a bond;

   b) the portfolio of pension obligations and the assigned portfolio of assets are ring-fenced, managed and organised separately from the other activities of the IORP, without any possibility of transfer;

   c) the future cash-flows of the assigned portfolio of assets replicate each of the expected future cash-flows of the portfolio of pension obligations in the same currency; any mismatch shall not give rise to risks which are material in relation to the risks inherent in the pension provision to which a matching premium is applied;

   d) the pension schemes / contracts underlying the portfolio of pension obligations do not give rise to future premium payments;

   e) the only pension liability risks connected to the portfolio of pension obligations are longevity risk, expense and pension option risk; the schemes / contracts underlying the pension obligations include no options for the members or beneficiaries or only a surrender option where the surrender value does not exceed the value of the assets covering the pension obligations at the time the surrender option is exercised;

   f) the cash-flows of the assets of the assigned portfolio of assets are fixed; however, where cash-flows of the pension obligations depend on inflation, the IORP may use assets where the cash-flows are fixed except for a dependence on inflation, provided that those asset replicate the expected and, where they relate to changes in the expected inflation, unexpected cash-flows of the portfolio of pension obligations;

   g) the cash-flows of the assets of the assigned portfolio of assets cannot be changed by the issuers of the assets or any third parties;

   h) no assets of the assigned portfolio of assets shall have a credit quality which has been assigned to credit quality step 4 or worse in accordance with Subsection RECAI and UECAI or in accordance with the IORP's own rating of the credit risk of the counterparty of the assets;

   i) notwithstanding point (j), the value of the assigned portfolio of assets that meet the following criteria shall be less than 15 % of the total value of the assigned portfolio of assets:

- at the time the asset entered the assigned portfolio of assets, the credit quality of the asset was assigned to credit quality step 3 in accordance with Subsections RECAI and UECAI or in accordance with the IORP's own rating,
- since entering the assigned portfolio of assets, the credit quality of the asset was assigned to credit quality step 3 or worse in accordance with Subsections RECAI and UECAI or in accordance with the IORP's own rating;

j) the value of the assigned portfolio of assets with a credit quality which has been assigned to credit quality step 3 in accordance with Subsections RECAI and UECAI or in accordance with the IORP's own rating shall be less than 30 % of the total value of the assigned portfolio of assets;

k) the IORP has declared to the supervisory authority that it applies the matching premium to the portfolio of pension obligations and that the requirements set out in points (a) to (j) are complied with.

2. For the purpose of paragraph 1(c), the expected cash-flow of the portfolio of pension obligations at a specific maturity means the probability-weighted average of future cash-flows at that maturity. Where the schemes / contracts underlying the pension obligations include a surrender option the calculation of the expected cash-flows shall be based on the assumption that the option will not be exercised.

3. For the purpose of paragraphs 1(c), the cash-flows of the assigned portfolio of assets shall take into account the expected default of the assets calculated in accordance with Part 2, (3) and (4).

4. For the purpose of paragraphs 1(f) and (g), the cash-flows of the assets of the assigned portfolio of assets shall not take into account the expected default of the assets.

5. The risk-free rates to calculate the best estimate of a portfolio of pension obligations that does not comply with the conditions set out in paragraph 1 shall not include a matching premium.

6. IORPs that apply the matching premium to a portfolio of pension obligations shall not choose to revert to the approach that does not include a matching premium. Where an IORP that applies the matching premium is no longer able to comply with the conditions set out in paragraph 1, it shall immediately inform the supervisory authority and take the necessary measures to restore compliance with these conditions. Where the IORP is not able to restore compliance with these conditions within two months it shall cease applying the matching premium to any of its pension obligations and shall only be able to apply the matching premium again after a period of 24 months.

Part 2 – Calculation of the matching premium

1. The matching premium referred to in Part 1, (1) shall be equal to the difference of the following:

a) the annual effective rate, calculated as the single discount rate that, where applied to the cash-flows of the portfolio of pension obligations, results in a value that is equal to the value of the portfolio of assigned assets;

b) the annual effective rate, calculated as the single discount rate that, where applied to the cash-flows of the portfolio of pension obligations, results in a value that is equal to the value of the best estimate of the portfolio of pension obligations where the time value is taken into account using the basic risk-free rate term structure.

The calculation in point (a) shall only consider the assigned assets whose de-risked cash-flows are required to replicate the cash-flows of the portfolio of pension obligations, excluding any assets in excess of that. For this purpose, a 'de-risked cash-flow' of an asset means the expected cash-flow of the asset where the expected default of the asset is taken into account in accordance with a probability of default that corresponds to the fundamental spread and a loss-given-default that is consistent with the assumption set out in paragraph 4.

2. The fundamental spread, referred to in paragraph 1, of a specific asset shall be equal to the sum of the following:
   a) the credit spread corresponding to the probability of default of the asset;
   b) a spread corresponding to the expected loss resulting from downgrading of the asset;

3. The credit spread referred to in paragraph 2(a) shall be based on the assumption that in case of default 30 % of the market value can be recovered.

   The probability of default referred to in paragraph 2(a) should be based on long-term default statistics that are relevant for the asset in relation to its duration, credit quality step and asset class.

4. The fundamental spread should not be lower than 75 % of the long-term average of the spread over the basic risk-free interest rate of assets of the same duration, credit quality step and asset class, as observed in financial markets. The long-term average shall be based on data of the last 30 years. Where a part of that data is not available, it shall be replaced by constructed data. The constructed data shall be based on the available and reliable data of the last 30 years. Data that is not reliable shall be replaced by constructed data using the same methodology. The constructed data shall be based on prudent assumptions.

5. The expected loss referred to in paragraph 2(b) shall correspond to the probability-weighted loss the IORP incurs if the asset is downgraded to a lower credit quality step and is replaced immediately afterwards. The calculation shall be based on the assumption that the replacing asset meets the following criteria:
   a) the replacing asset has the same cash-flow pattern as the replaced asset before downgrade;
   b) the replacing asset belongs to the same asset class as the replaced asset;
   c) the replacing asset has the same credit quality step as the replaced asset before downgrade or a higher one.

6. Notwithstanding paragraph 2, where no reliable credit spread can be derived from the default statistics referred to in paragraph 3 the fundamental spread shall be equal to the long-term average of the spread referred to in paragraph 4.

Notwithstanding paragraphs 2 to 6, the calculation of the fundamental spreads shall ensure that the matching premium for an asset of credit quality step 3 does not exceed the matching premium of assets of credit quality step 1 or 2. Where necessary to ensure this, the fundamental spread for the assets of credit quality step 3 shall be increased.

Annex 3 – 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, based on S&P rating scale. This table is for information purposes only and only for application in this QIS.

Rating	Credit Quality Step
AAA	0
AA	1
A	2
BBB	3
BB	4
B	5
CCC or lower	6

Annex 4 – Principles for recognising risk mitigation techniques in the SCR standard formula

Principle 1: Economic effect over legal form

- Risk mitigation techniques should be recognised and treated consistently, regardless of their legal form or accounting treatment, provided that their economic or legal features meet the requirements for such recognition.

- Where risk mitigation techniques are recognised in the SCR calculation, any material new risks shall be identified, quantified and included within the SCR. Where the risk mitigation technique actually increases risk, then the SCR should be increased.

- The calculation of the SCR should recognise risk mitigation techniques in such a way that there is no double counting of mitigation effects.

Principle 2: Legal certainty, effectiveness and enforceability

- The transfer of risk from the IORP to the third party shall be effective in all circumstances in which the IORP may wish to rely upon the transfer. Examples of factors which the IORP shall take into account in assessing whether the transaction effectively transfers risk and the extent of that transfer include:
  - whether the relevant documentation reflects the economic substance of the transaction;
  - whether the extent of the risk transfer is clearly defined and beyond dispute;
  - whether the transaction contains any terms or conditions the fulfilment of which is outside the direct control of the IORP. Such terms or conditions may include those which:
    - would allow the third party unilaterally to cancel the transaction, except for the non-payment of monies due from the IORP to the third party under the contract;
    - would increase the effective cost of the transaction to the IORP in response to an increased likelihood of the third party experiencing losses under the transaction;
    - would oblige the IORP to alter the risk that had been transferred with the purpose of reducing the likelihood of the third party experiencing losses under the transaction;
    - would allow for the termination of the transaction due to an increased likelihood of the third party experiencing losses under the transaction;
    - could prevent the third party from being obliged to pay out in a timely manner any monies due under the transaction; or
    - could allow the maturity of the transaction to be reduced.

- An IORP shall also take into account circumstances in which the benefit to the IORP of the transfer of risk could be undermined. For instance, where the IORP, with a view to reducing potential or actual losses to third parties, provides support to the transaction, including support beyond its contractual obligations.

- In determining whether there is a transfer of risk, the entire contract shall be considered. Further, where the contract is one of several related contracts the

entire chain of contracts, including contracts between third parties, shall be considered in determining whether there is a transfer of risk. In the case of (re)insurance, the entire legal relationship between the cedant and (re)insurer shall be taken into account in this determination.

- The IORP shall take all appropriate steps, for example a sufficient legal review, to ensure and confirm the effectiveness and ongoing enforceability of the risk mitigation arrangement and to address related risks. 'Ongoing enforceability' refers to any legal or practical constraint that may impede the IORP from receiving the expected protection. In the case of financial risk mitigation, the allowance in the SCR of the 'counterparty default risk' derived from the 'financial risk mitigation technique' does not preclude the necessity of satisfying the 'ongoing enforceability'.

- In the case of financial risk mitigation, instruments used to provide the risk mitigation together with the action and steps taken and procedures and policies implemented by the IORP shall be such as to result in risk mitigation arrangements which are legally effective and enforceable in all jurisdictions relevant to the arrangement and, where appropriate, relevant to the hedged asset or liability.

- Procedures and processes not materialized in already existing financial contracts providing protection at the date of reference of the solvency assessment, shall not be allowed to reduce the calculation of the SCR with the standard formula.

Principle 3: Liquidity and certainty of value

- To be eligible for recognition, the risk mitigation techniques shall be valued in line with the principles laid down for valuation of assets and liabilities, other than technical provisions. This value shall be sufficiently reliable and appropriate to provide certainty as to the risk mitigation achieved.

- Regarding the liquidity of the financial risk mitigation techniques, the following applies:
  o the IORP should have written internal policy regarding the liquidity requirements that financial risk mitigation techniques should meet, according to the objectives of the IORP's risk management policy;
  o financial risk mitigation techniques considered to reduce the SCR have to meet the liquidity requirements established by the IORP; and
  o the liquidity requirements shall guarantee an appropriate coordination of the liquidity features of the hedged assets or liabilities, the liquidity of the financial risk mitigation technique, and the overall policy of the IORP regarding liquidity risk management.

Principle 4: Credit quality of the provider of risk mitigation

- Providers of risk mitigation instruments should have an adequate credit quality to guarantee with appropriate certainty that the IORP will receive the protection in the cases specified by the contracting parties.

- Credit quality should be assessed using objective techniques according to generally accepted practices.

- The assessment of the credit quality of the provider of protection shall be based on a joint and overall assessment of all the features or contracts directly and explicitly linked to the financial risk mitigation technique. This assessment shall be carried out in a prudent manner, in order to avoid any overstatement of the credit quality.

- The correlation between the values of the instruments relied upon for risk mitigation and the credit quality of their provider shall not be unduly adverse, i.e. it should not be materially positive (known in the banking sector as 'wrong way risk'). As an example, exposures in a company belonging to a group should not be mitigated with CDS provided by entities of the same group, since it is very likely that a failure of the group will lead to falls in the value of the exposure and simultaneous downgrade or failure of the provider of protection. This requirement does not refer to the systemic correlation existing between all financial markets as a whole in times of crisis.

Principle 5: Direct, explicit, irrevocable and unconditional features

- Financial risk mitigating techniques can only reduce the capital requirements if:
  - they provide the IORP with a direct claim on the protection provider;
  - they contain an explicit reference to specific exposures or a pool of exposures, so that the extent of the cover is clearly defined and incontrovertible;
  - they are not subject to any clause, the fulfilment of which is outside the direct control of the IORP, that would allow the protection provider to unilaterally cancel the cover or that would increase the effective cost of protection as a result of certain developments in the hedged exposure; and
  - they are not subject to any clause outside the direct control of the IORP that could prevent the protection provider from its obligation to pay out in a timely manner in the event that a loss occurs on the underlying exposure.

Annex 5 – Questions to stakeholders

General

Q1. Do stakeholders agree with the general set-up of the QIS exercise as put forward in the Introduction (Chapter 1)? What improvements do stakeholders suggest?

Q2. Do stakeholders believe that the adjustment (discretionary and conditional benefits, last resort benefit reductions) and security mechanisms (sponsor support, pension protection schemes) IORPs dispose of are taken into account adequately?

Q3. Do stakeholders believe that the draft technical specifications provide enough information and are sufficiently clear and understandable? Which parts could be improved upon?

Q4. Do stakeholders believe that the calculations proposed in the technical specifications are feasible at appropriate costs and with appropriate accuracy within the given timeframe of the QIS?

Valuation holistic balance sheet

Q5. Do stakeholders believe that the draft technical specifications provide enough guidance on how to set up and value the holistic balance sheet as discussed in Chapter 2? If not, which parts could be improved upon and in what way?

Q6. Given the purpose of the QIS, do stakeholders consider the proposed simplifications for the valuation of the holistic balance sheet (for the risk margin in section 2.5, sponsor support and pension protection schemes in 2.6 and amounts recoverable from insurance in 2.7) adequate? Do you have suggestions for additional simplifications that would be appropriate?

Q7. The best estimate of technical provisions should be based on the most recent mortality tables including the future trend in mortality rates (Section 2.4). Do stakeholders believe that IORPs will be able to take into account this trend in mortality rates? Can you explain?

Q8. Is it clear enough from the technical specifications what cash flows should be taken into account in the calculation of the best estimate (e.g. in relation to benefits (unconditional, pure conditional, pure discretionary, mixed), contributions, expenses, etc.) and how the projection of these cash flows should be made (Section 2.4)?

Q9. EIOPA is considering to take into account in the QIS the possibility in some member states to reduce benefits in case of sponsor default (for example, when a pension protection scheme does not guarantee the full level of benefits) in the valuation of the best estimate of technical provisions (see Reduction of benefits in case of sponsor default in Section 2.4 and Pension protection schemes in Section 2.6). Do stakeholders agree and, if yes, should

it only apply in case of sponsor support backed up by a pension protection scheme or to sponsor support in general?

Q10. The technical specifications propose that security mechanisms should be valued on a market consistent basis, i.e. by calculating the probability-weighted average of (discounted) expected payments from the sponsor and the pension protection scheme (Section 2.6). Do stakeholders agree with the principles for the valuation of sponsor support and pension protection schemes? If not, what alternatives would you propose?

Q11. Do stakeholders have suggestions for the parameters - such as the probability of default and the recovery rate in the event of default - used in the valuation of sponsor support and pension protection schemes (Section 2.6)?

Q12. Do stakeholders agree with the methodology set out to value the maximum value of sponsor support (Section 2.6)? Do stakeholders have suggestions for the parameters used in valuing the maximum amount of sponsor support? In particular, with regard to the proportions of future profits / EBTDA and the time period of the calculations.

Q13. The draft technical specifications propose performing an upward shift in the basic risk-free interest rate curve to approximate the so-called counter cyclical premium or to allow IORPs – under conditions – to apply the so-called matching premium (Section 2.8). Do stakeholders agree with this approach to take into account the long-term nature of pension liabilities?

Q14. Do stakeholders agree that the proposed way to derive the level B discount rate adequately reflect the expected return on assets of IORPs (Section 2.8)? If not, what alternative would you propose?

Q15. Do stakeholders agree that the draft technical specifications specify a fixed yearly percentage of respectively 2% and 3% for the expected inflation rate and salary growth? Or should IORPs also be allowed to expected inflation implied by financial markets? Could you explain?

SCR standard formula and MCR

Q16. Do stakeholders believe that the description of the SCR in Chapter 3 is sufficiently clear and understandable to enable participants in the QIS to perform the necessary calculations?

Q17. Do stakeholders believe that the risks IORPs are facing are adequately reflected in the calculation of the SCR and MCR (Chapter 3 and 4)? Are there in the stakeholders' view any risks being considered that are not material and could be excluded from the technical specifications? Are there other risks that should be considered in the calculation of the SCR?

Q18. Do stakeholders believe that the way the loss-absorbing capacity of adjustment mechanisms and security mechanisms is taken into account in the calculation of the SCR (Section 3.2) is adequate?

Q19. Do stakeholders believe that the calculation of SCR in the Operational risk module (Section 3.3) is adequate for IORPs?

Q20. Do stakeholders believe that the simplifications provided for the calculation of the SCR (for spread risk on bonds in section 3.5, value of collateral in section 3.6 and mortality, longevity, benefit option and catastrophe risk in section 3.7) are adequate? Do stakeholders have any concrete suggestions for additional simplifications?

Q21. Do stakeholders believe that the treatment of sponsor default risk in the counterparty default risk module of the SCR calculation (Section 3.6) is appropriate? If not, what improvements would stakeholders suggest?

Q22. Do stakeholders believe that the calculation of SCR in the Benefit option risk sub-module (Section 3.7) is adequate for IORPs?

Q23. Do stakeholders believe that the descriptions of financial and insurance risk mitigation (Section 3.9 and 3.10) are sufficiently clear and understandable to enable participants in the QIS to perform the necessary calculations?