CEIOPS
Committee of European Insurance and Occupational Pensions Supervisors

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CEIOPS' Advice for Level 2 Implementing Measures on Solvency II:

Partial internal models

Former Consultation Paper 65

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Table of contents

1.Introduction

1.1 One of CEIOPS' primary responsibilities is to provide technical support to the European Commission in developing a new solvency system for insurance and reinsurance undertakings (hereafter "undertakings") in the EU – Solvency II.

1.2 In its letter of 19 July 2007 the European Commission requested CEIOPS to provide final, fully consulted Advice on Level 2 Implementing measures by October 2009 and recommended CEIOPS to develop Level 3 guidance on certain areas to foster supervisory convergence. On 12 June 2009 The European Commission sent a letter with further guidance regarding the Solvency II project, including the list of implementing measures and timetable until implementation[1].

1.3 The main objective of this document is therefore to provide the European Commission with sufficient technical Advice so that it is in a position to finalise its proposal for the 'Level 2' implementing measures setting out: the adaptations to be made to the standards set out in Articles 120 to 125 in order to take account of the limited scope of the application of the partial internal model (Article 114(2) of the Solvency II Framework Directive (Level 1 Text)[2].

1.4 Generally, the Advice in this paper may be seen as an extension of the Level 1 Text, providing detail on the scope of partial internal models, specific provisions for the approval of partial internal models, in particular how results of partial internal models may be integrated into the standard formula's results; the concept of major business unit; the integration of risks not covered in the standard formula; and last, but not least, the remaining adaptations to be made to standards set out in Articles 120 to 125. The integration of partial internal models' results into the standard formula's results is also part of the impact assessment study on Level 2 implementing measures being carried out by the European Commission, with four policy Options under consideration. The impact spreadsheets and narrative are attached to this document.

1.5 Throughout the paper CEIOPS has taken account of the proportionality principle described in Article 29.3 of the Level 1 Text. CEIOPS has already published Advice on proportionality[3], including Advice on its application to internal models and that underpins this Advice.

1.6 A distinction has to be made between:

a. the dependency structure that an undertaking may apply when aggregating risks within a partial internal model; and

b. the dependency structure to be applied to integrate a partial internal model with the standard formula.

1.7 For the part the undertaking is modelling (i.e., the partial internal model), and always subject to supervisory approval, the undertaking may use a

[1] See http://www.ceiops.eu/content/view/5/5/
[2] Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II), Official Journal, L 335, 17 December 2009, http://eur-lex.europa.eu/JOHtml.do?uri=OJ%3AL%3A2009%3A335%3ASOM%3AEN%3AHTML
[3] http://www.ceiops.eu/media/docman/public_files/publications/submissionstotheec/AdviceProportionality.pdf

different dependency structure from the one prescribed by the standard formula, as long as it is compliant with the standards set out in Articles 120 to 125. For example, an undertaking may decide to model the market risk module in its entirety (including its sub-modules). In this case, subject to supervisory approval and limited to this risk module, the undertaking may decide on the most appropriate way to model it, including the dependencies between the different risks. This situation is covered in CEIOPS Advice on Tests and Standards for internal models approval and it is stressed that is outside the scope of the current paper.

1.8 The referred policy Option of the impact assessment study deals solely with point (b), *i.e.* the dependency structure to be applied by undertakings to integrate the partial internal model with the standard formula.

1.9 Furthermore, CEIOPS will also work to develop 'Level 3' standards and guidance to enable further convergence of supervisory practice.

1.10 Finally, CEIOPS would like to acknowledge the significant contribution made by stakeholder groups during the preparation of this Advice. Good working level contacts have been established with a number of stakeholder groups, enabling CEIOPS to receive expert input and to test ideas quickly.

2.Legal basis

2.1 Key extracts from Level 1 Text

2. 1 This Section reproduces the key extracts from the Level 1 Text which are directly relevant for partial internal models.

2. 2 Article 112 paragraphs 1 to 3 sets the possible scope of a partial internal model.

Article 112

General provisions for the approval of full and partial internal models

"1. Member States shall ensure that insurance or reinsurance undertakings may calculate the Solvency Capital Requirement using a full or partial internal model as approved by the supervisory authorities.

2. Insurance and reinsurance undertakings may use partial internal models for the calculation of one or more of the following:

(a) one or more risk modules, or sub-modules, of the Basic Solvency Capital Requirement, as set out in Articles 104 and 105;

(b) the capital requirement for operational risk as laid down in Article 106;

(c) the adjustment referred to in Article 108.

In addition, partial modelling may be applied to the whole business of insurance and reinsurance undertakings, or only to one or more major business units.

3. In any application for approval, insurance and reinsurance undertakings shall submit, as a minimum, documentary evidence that the internal model meets the requirements set out in Articles 120 to 125.

Where the application for that approval relates to a partial internal model, the requirements set out in Articles 120 to 125 shall be adapted to take account of the limited scope of the application of the model".

2. 3 Article 113 sets out the specific provisions for the approval of partial internal models.

Article 113

Specific provisions for the approval of partial internal models

"1. In the case of a partial internal model, supervisory approval shall only be given if that model complies with the requirements set out in Article 112 and the following additional conditions:

(a) the reason for the limited scope of application of the model is properly justified by the undertaking;

(b) the resulting Solvency Capital Requirement reflects more appropriately the risk profile of the undertaking and in particular meets the principles set out in Subsection 1;

(c) its design is consistent with the principles set out in Subsection 1 so as to allow the partial internal model to be fully integrated into the Solvency Capital Requirement Standard Formula.

2. When assessing an application for the use of a partial internal model which only covers certain sub-modules of a specific risk module, or some of the business units of an insurance or reinsurance undertaking with respect to a specific risk module, or parts of both, supervisory authorities may require the insurance and reinsurance undertakings concerned to submit a realistic transitional plan to extend the scope of the model.

The transitional plan shall set out the manner in which insurance and reinsurance undertakings plan to extend the scope of the model to other sub-modules or business units, in order to ensure that the model covers a predominant part of their insurance operations with respect to that specific risk module".

2. 4 Article 113 explicitly makes a link to Subsection 1 of Section 4 of Chapter VI of the Level 1 Text, of which Article 101 is the most relevant for partial internal model integration.

Article 101

Calculation of the Solvency Capital Requirement

"1. The Solvency Capital Requirement shall be calculated in accordance with paragraphs 2 to 5:

2 The Solvency Capital Requirement shall be calculated on the presumption that the undertaking will carry on its business as a going concern.

3. The Solvency Capital Requirement shall be calibrated so as to ensure that all quantifiable risks to which an insurance or reinsurance undertaking is exposed are taken into account. It shall cover existing business, as well as the new business expected to be written over the following 12 months. With respect to existing business, it shall cover unexpected losses only.

It shall correspond to the Value-at-Risk of the basic own funds of an insurance or reinsurance undertaking subject to a confidence level of 99.5% over a one-year period.

4. The Solvency Capital Requirement shall cover at least the following risks:

(a) non-life underwriting risk;

(b) life underwriting risk;

(c) health underwriting risk;

(d) market risk;

(e) credit risk;

(f) operational risk.

Operational risk as referred to in point (f) of the first subparagraph shall include legal risks, and exclude risks arising from strategic decisions, as well as reputation risks.

5. When calculating the Solvency Capital Requirement, insurance and reinsurance undertakings shall take account of the effect of risk mitigation techniques, provided that credit risk and other risks arising from the use of such techniques are properly reflected in the Solvency Capital Requirement".

2.2 Legal basis for the Level 2 implementing measures

2. 5 This Section deals with the identification of the legal basis for the Level 2 implementing measure being examined, *i.e.* identification of the Article(s) calling for an implementing measure with respect to that issue. Article 114(2) calls for an implementing measure for the procedure to the adaptations to be made to the standards set out in Articles 120 to 125, in order to take account of the limited scope of the application of the partial internal model.

Article 114

Implementing measures

"The Commission shall adopt implementing measures setting out following:

(1) the procedure to be followed for the approval of an internal model;

(2) the adaptations to be made to the standards set out in Articles 120 to 125 in order to take account of the limited scope of the application of the partial internal model.

Those measures designed to amend non-essential elements of this Directive, by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 301(3)".

2. 6 On the other hand, Article 127 calls for the adaptation of implementing measures with respect to Articles 120 to 125.

Article 127

Implementing measures

"The Commission shall, in order to ensure a harmonised approach to the use of internal models throughout the Community and to enhance the better assessment of the risk profile and management of the business of insurance and reinsurance undertakings, adopt implementing measures with respect to Articles 120 to 126.

Those measures designed to amend non-essential elements of this Directive, by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 301(3)".

3.Advice

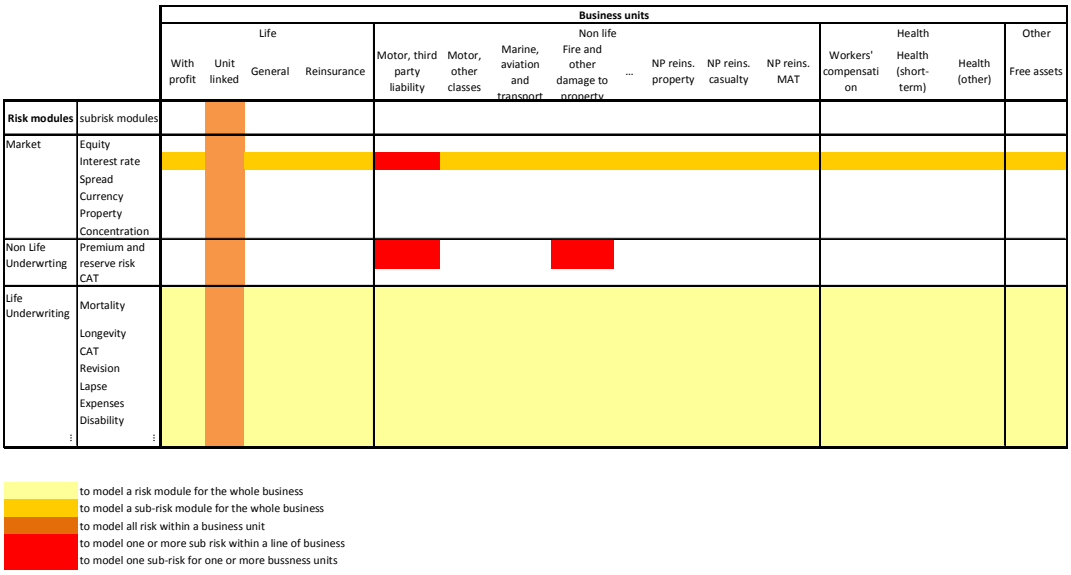
3.1 Scope of partial internal models

3.1. According to Article 112(2) of the Level 1 Text, undertakings may use partial internal models for the calculation of: one or more risk modules, or sub-modules of the Basic SCR; the capital requirement for operational risk and the adjustment for the loss-absorbing capacity of technical provisions and deferred taxes. In addition, partial modelling may be applied to the whole business of undertakings, or only to one or more major business units.

3.2. The modelling freedom allowed by the Level 1 Text for partial internal models is high. Undertakings may model:

- One or more risk modules for the whole business;
- One or more risk modules for one or more major business units;
- One or more risk sub-modules for the whole business;
- One or more risk sub-modules, in the same or different risk modules, for one or more major business units
- The adjustment for the loss-absorbing capacity of technical provisions and deferred taxes for the whole business or for one or more major business units;
- The capital requirement for operational risk for the whole business or for one or more major business units.

3.3. Taking as an example the risk modules and business units as expressed in the standard formula, there are different levels of granularity to which partial internal models can be applicable.



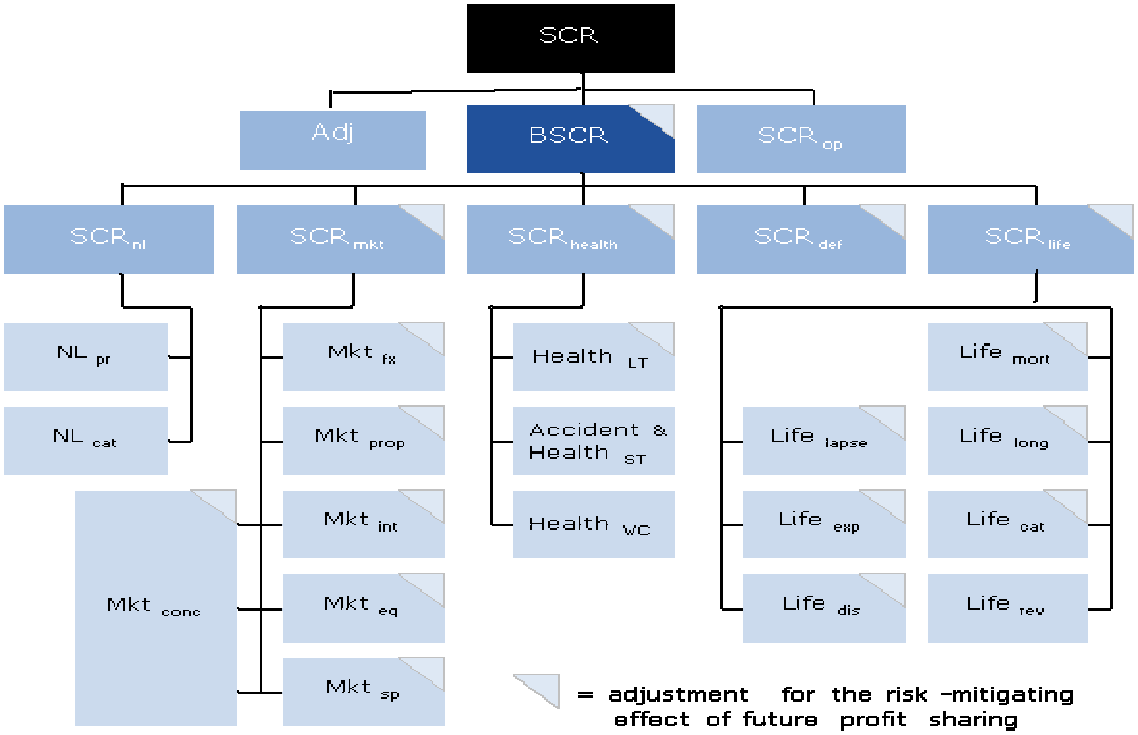
3.4. However, the previous example does not reflect all specificities partial internal models may have. For example, the term "business unit" is not defined in the Level 1 Text and it may differ from one undertaking to another (whether it is a solo or a group undertaking, an insurance or a reinsurance undertaking). The concept of a major business unit is clarified in Section 3.2 of this Advice.

3.5. Additionally, undertakings employing partial internal models may use different risk categorizations than those in the standard formula. For example, they may decide to model risks not covered by the standard formula (please refer to Section 3.8 of this Advice) or to model jointly two risks such as spread risk and counterparty default risk, as this reflects better their business uses and needs. Moreover, subject to a number of conditions Article 122(1) allows undertakings for internal modelling purposes to use a different time period or risk measure to that set out in Article 101(3)[4]. Finally, according to paragraph 3.125 of CEIOPS Advice on the Procedure to be followed for the approval of an internal model, neither full nor partial internal models need to follow a modular structure[5].

3.6. Annex A provides a set of examples of the different forms that partial internal models may assume in Solvency II. However, this is not an exhaustive list. The examples encompass several dimensions, e.g. whether the risk categorization and model calibration are the same as in the standard formula, whether or not all business units are modelled within the scope of the partial internal model, etc. The examples are based on the standard formula structure as set out in CEIOPS Quantitative Impact Study 4 (QIS4).

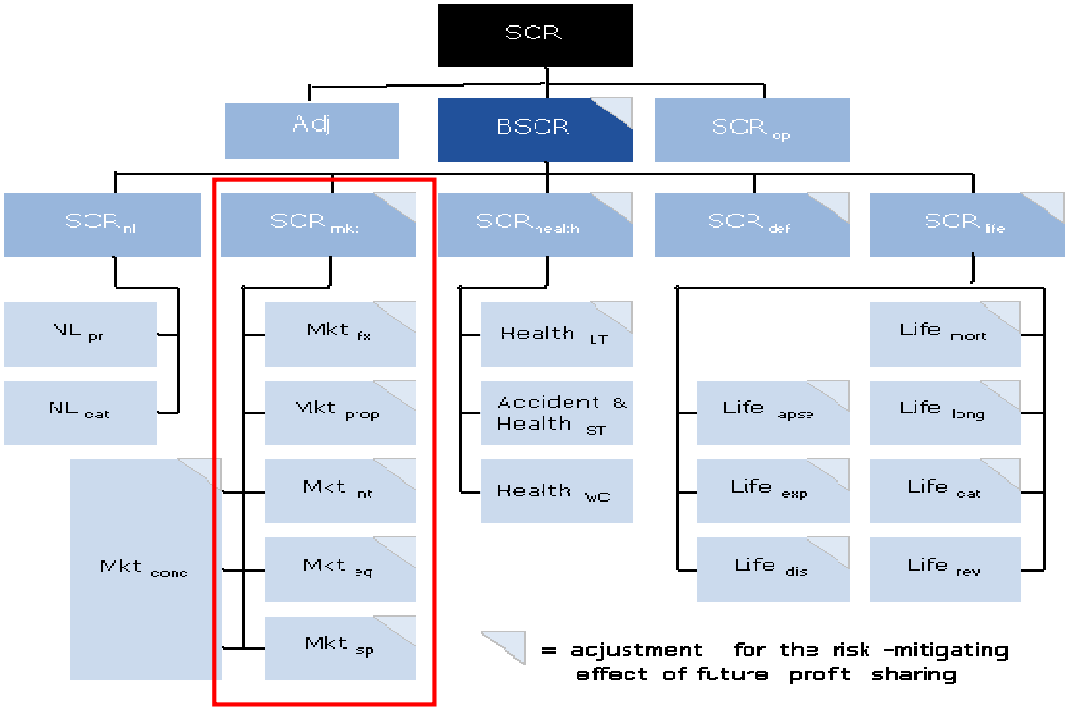
[4] For example, a different time period or risk measure may be used as long as the outputs of the internal model can be used by those undertakings to calculate the SCR in a manner that provides policyholders with a level of protection equivalent to that set out in Article 101. For more details please refer to Section 6 of CEIOPS Advice on Tests and Standards for internal models approval, where the Calibration standards are described

[5] For further details please refer to the CEIOPS Advice on the procedure to be followed for the approval of an internal model

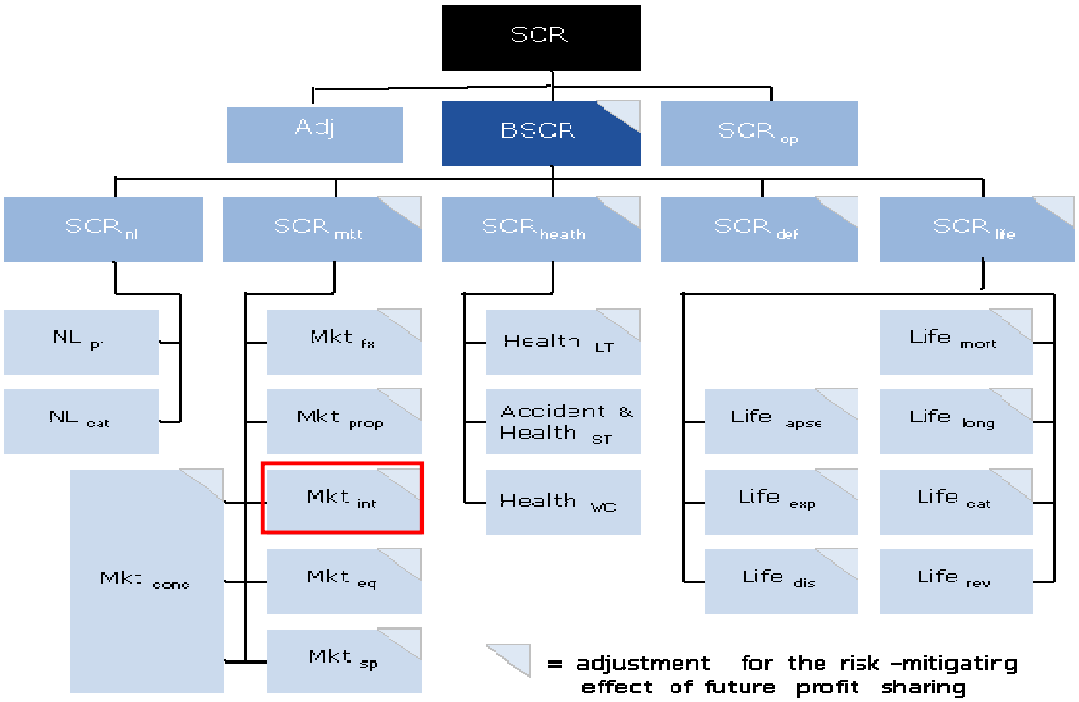


3.7. The examples range from the simplest cases where there is a straight replacement of a risk module (or risk sub-module) of the standard formula, to situations where different risk modules are modelled jointly, where risk sub-modules not belonging to the same risk module are modelled jointly, where risks not covered in the standard formula are modelled or where not all major lines of business are modelled, as shown in the diagrams below. In order to facilitate the reading and understanding of the examples they start from situations where only a small number of risks are modelled within the scope of the partial internal model to situations where only a small risk and/or business unit of the undertakings uses the standard formula. It shall be stressed that all situations are possible - it may be as common to have undertakings with a more limited scope of the partial internal model as to have undertakings with partial internal models that cover the most predominant part of risks and business units (e.g. groups internal models). For further examples please refer to Annex A.

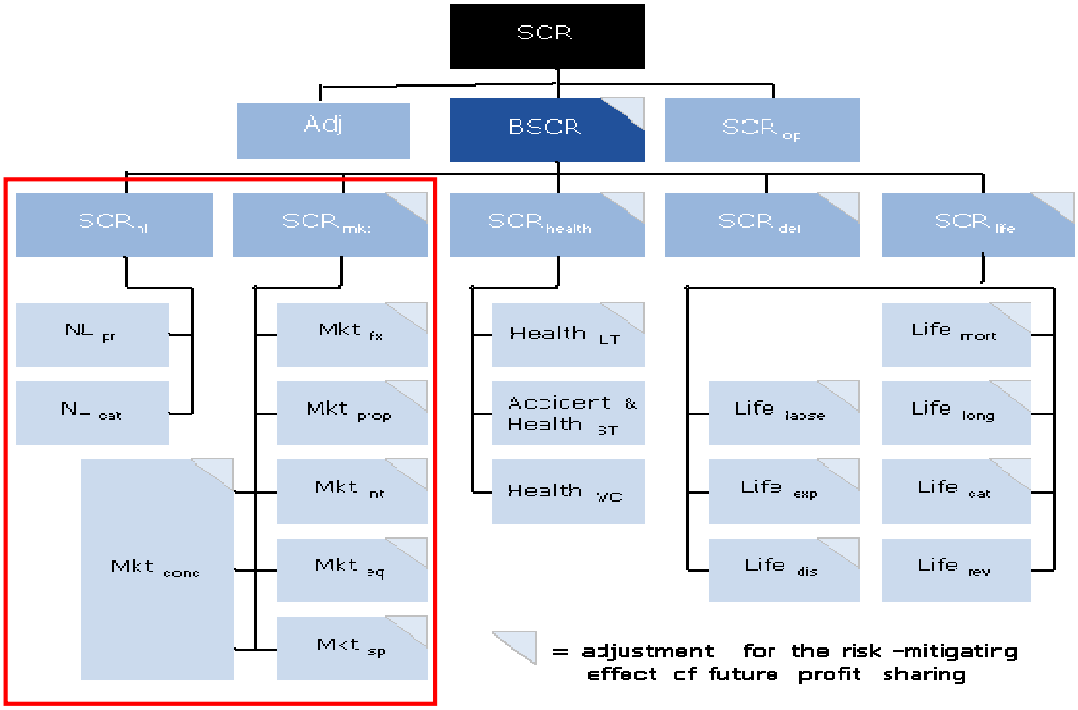
Modeling one risk module



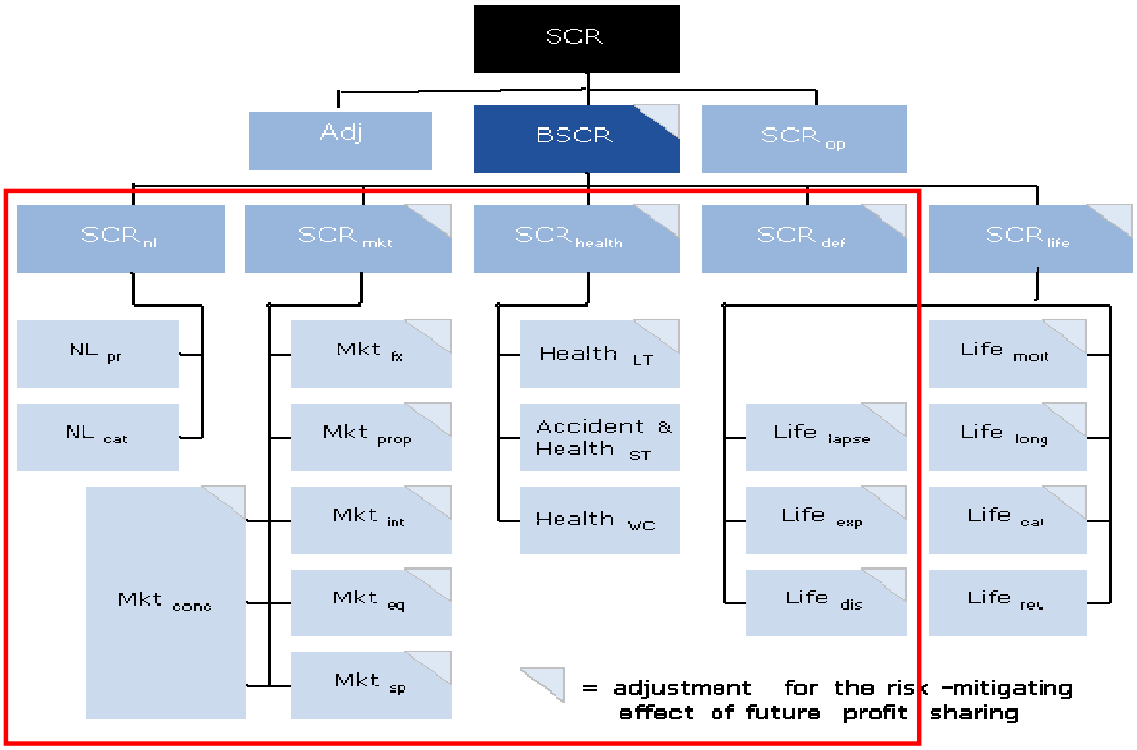
Modeling one risk sub-module



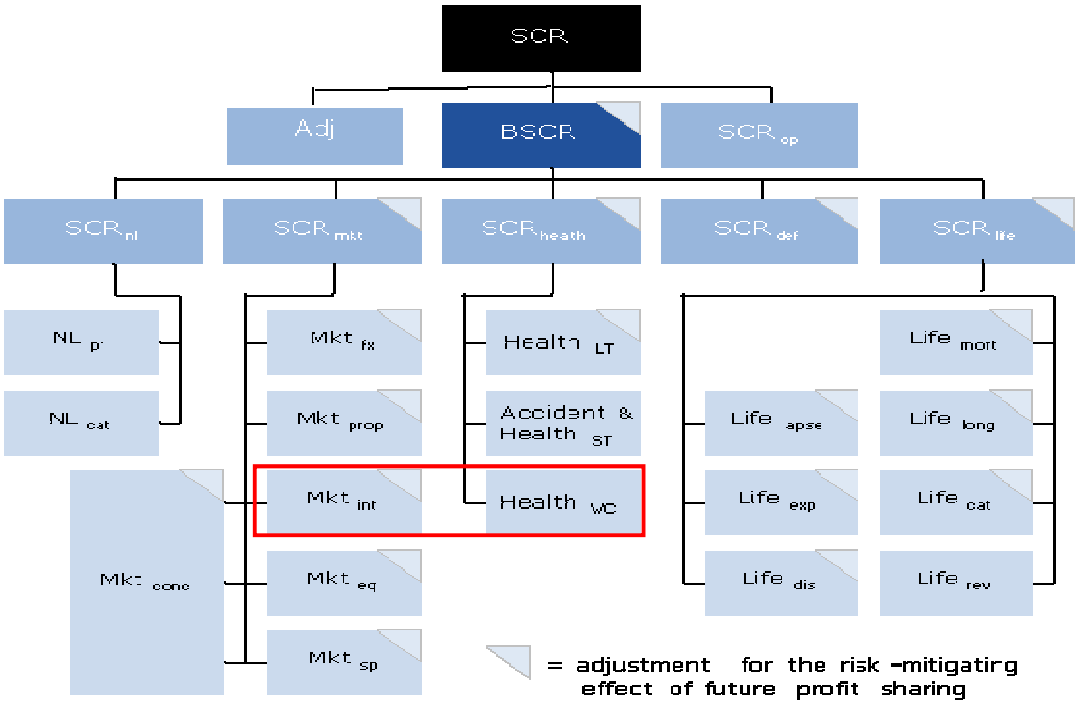
Modeling two (or more) risk modules jointly



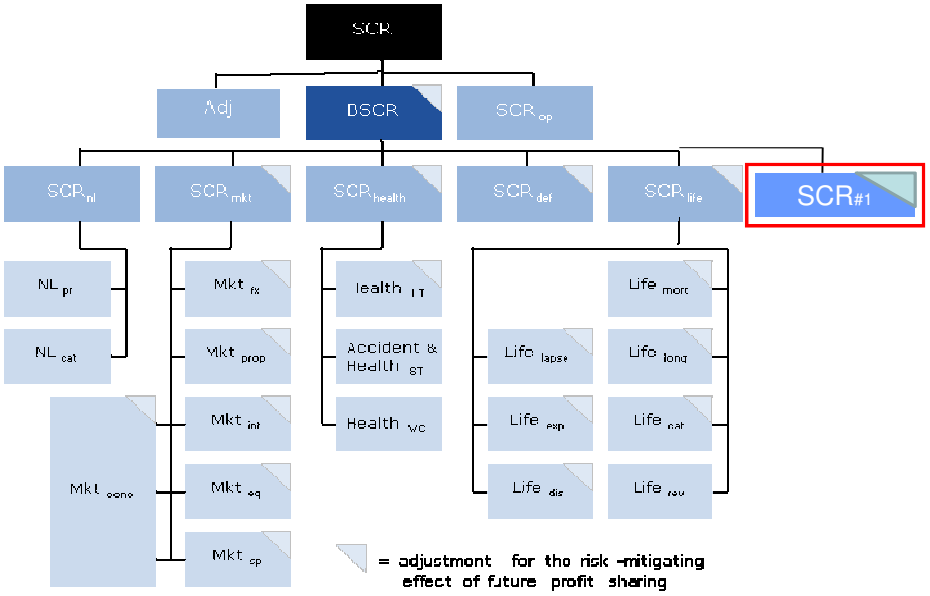
Modeling two (or more) risk modules jointly



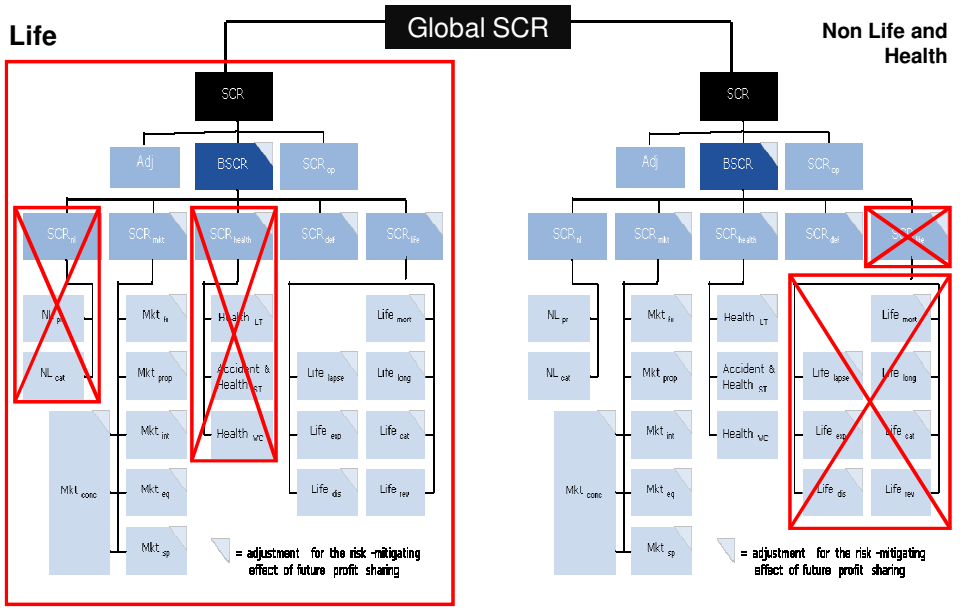
Modeling two (or more) risk sub-modules from different risk modules jointly



Risks not modeled in the standard formula (e.g. risk #1)



Modeling all risks for 1 or more lines of business (e.g. composite: all risks for the life business are internally modeled)



CEIOPS' Advice

3.8. Article 112(2) of the Level 1 Text set outs the possible scope for a partial internal model. The modelling freedom allowed by the Level 1 Text for partial internal models is high. Undertakings may model:

- One or more risk modules for the whole business;
- One or more risk modules for one or more major business units;
- One or more risk sub-modules for the whole business;
- One or more risk sub-modules, in the same or different risk modules, for one or more major business units;
- The adjustment for the loss-absorbing capacity of technical provisions and deferred taxes for the whole business or for one or more major business units;
- The capital requirement for operational risk for the whole business or for one or more major business units.

3.9. Additionally, undertakings employing partial internal models may use different risk categorizations than those in the standard formula. For example, they may decide to model risks not covered by the standard formula. Moreover, subject to a number of conditions, Article 122(1) allows undertakings for internal modelling purposes to use a different time period or risk measure to that set out in Article 101(3). Finally, according to

paragraph 3.125 of CEIOPS Advice on the Procedure to be followed for the approval of an internal model, neither full nor partial internal models need to follow a modular structure.

3.2 Major business units

3.10. A major business unit with regards to partial internal models shall be defined as a functional unit in an undertaking, either a solo entity or a group:

- which is managed with independence and with dedicated governance processes;
- for which it makes sense to calculate profit and losses as set out in Article 123 of the Level 1 Text, given the undertaking's business and organization;
- for which it makes sense to calculate the capital charge for one or more risks (sub)modules of Article 101 of the Level 1 Text; the adjustment for the loss-absorbing capacity of technical provisions and deferred taxes as mentioned in the referred Article; the capital requirement for operational risk and/or the capital charge for any other material quantifiable risk(s).

3.11. The term major business unit is closely related with the Use test as defined in Article 120 of the Level 1 Text, therefore artificially defined business units without clear meaning/relevance to business organization are not considered to be acceptable. Major business units are also closely related with the profit and loss attribution as defined in Article 123 of the Level 1 Text.

3.12. The word major implies that those business units are materially significant for the SCR calculation and may have a material effect on the final SCR (Cf. CEIOPS Advice on Tests and Standards for internal models approval on Article 121 regarding risk ranking and model coverage). Immaterial business units, taking into account the nature, scale and complexity of the risks inherent to these business units, shall not be considered as major business unit.

3.13. The classification and justification of the major business units are a part of the internal model governance. Its definition should be consistent and stable.

3.14. The term major business unit is both linked to the scope of the model and to the policy for changing the internal model as defined in Article 115 of the Level 1 Text. Changes in the definition of major business units can result in an extension or restriction of the scope of the model or in a major change to the internal model (the overall scope of the internal model remains the same but that which falls within several business units may change).

3.15. A major business unit for which partial internal modelling is used for SCR calculation needs to have its scope clearly defined in order to avoid "cherry picking" situations. There shall be no ambiguity as to which risks, assets and/or liabilities are included in the major business unit and which are excluded.

3.16. A major business unit shall reflect the economic reality of the undertaking. The definition shall not include exceptions as these may give rise to possible ambiguity in the scope, or may allow the exclusion of risks with weaker management. For example, if the major business unit is one line of business, the major business unit shall comprise the totality of that line of business, and shall not exclude any contracts and its definition shall avoid regulatory arbitrage.

3.17. Examples of what may be considered as major business units are expressed below as long as they comply with the provisions set out above. This list is not exhaustive:

- Ring fenced funds;
- Branches;
- Life and or non-life business for composite undertakings;
- Liabilities arising from some specified lines of business;
- Geographical regions;
- Departments defined by type of customer (e.g. PIM for retail business or corporate);
- Departments defined by the distribution channel (for example, brokerage or accepted reinsurance).

3.18. Undertakings are allowed, subject to supervisory approval, to use their definitions of major business units as long as they are compliant with the provisions set out in this Section. The supervisory assessment may take into consideration several criteria such as:

- compliance with the Use test as set in Article 120 of the Level 1 Text, namely whether the definition of business is consistent with the way the business is organized and managed, with the risk management system of the undertaking and with the governance of the undertakings (including reporting processes and channels);
- compliance and consistency with the profit and loss attribution as set out in Article 123 of the Level 1 Text;
- the economic reality of the business unit;
- reflection in the day-to-day organization (independence of the risk management, reporting lines…)
- Attention should be paid by supervisory authorities in order not to introduce possible regulatory arbitrage.

3.19. In group internal models, CEIOPS expects that a major business unit would typically be a legal entity. However it can be also the examples provided for solo undertakings, sometimes with higher granularity e.g. by geographical location or lines of business in a group perspective (e.g. containing the same business – for example motor insurance – for several legal entities). Groups can be very complex and their organization can vary greatly, therefore groups should be given a fair amount of flexibility when defining business units, subject to the conditions above. For Groups the definition of what constitutes a major business unit may be done at group or at solo level, this is to avoid situations where a partial for a major

business unit at solo level that adequately reflects the risk profile of that business unit, is not allowed in the group internal model due to that business unit does not fulfil the materiality concept at group level.

CEIOPS' Advice

3.20. A major business unit with regards to partial internal models shall be defined as a functional unit in an undertaking, either a solo entity or a group:

- which is managed with independence and with dedicated governance processes;
- for which it makes sense to calculate profit and losses as set out in Article 123 of the Level 1 Text, given the undertaking's business and organization;
- for which it makes sense to calculate the capital charge for one or more risks (sub)modules of Article 101 of the Level 1 Text; the adjustment for the loss-absorbing capacity of technical provisions and deferred taxes as mentioned in the referred Article; the capital requirement for operational risk and/or the capital charge for any other material quantifiable risk(s).

3.21. The term major business unit is closely related with the Use test as defined in Article 120 of the Level 1 Text, therefore artificially defined business units without clear meaning/relevance to business organization are not considered to be acceptable. Major business units are also closely related with the profit and losses attribution as defined in Article 123 of the Level 1 Text.

3.22. The word major implies that those business units are materially significant for the SCR calculation and may have a material effect on the final SCR (Cf. CEIOPS Advice on Tests and Standards for internal models approval on Article 121 regarding risk ranking and model coverage). Immaterial business units, taking into account the nature, scale and complexity of the risks inherent to these business units, shall not be considered as major business unit.

3.23. The classification and justification of the major businesses units are a part of the internal model governance. Its definition shall be consistent and stable.

3.24. The term major business unit is both linked to the scope of the model and to the policy for changing the internal model as defined in Article 115 of the Level 1 Text. Changes in the definition of major business units can result in an extension or restriction of the scope of the model or in a major change to the internal model.

3.25. There shall be no ambiguity as to which risks, assets and/or liabilities are included in the major business unit and which are excluded.

3.26. Examples of what may be considered as major business units are expressed below as long as they comply with the provisions set out above. This list is not exhaustive:

- Ring fenced funds;
- Branches;
- Life and or non-life business for composite undertakings;

- Liabilities arising from some specified lines of business;
- Geographical regions;
- Departments defined by type of customer (e.g. PIM for retail business or corporate);
- Departments defined by the distribution channel (for example, brokerage or accepted reinsurance).

3.27. Undertakings are allowed, subject to supervisory approval, to use their definitions of major business units as long as they are compliant with the provisions set out on this Section. The supervisory assessment may take into consideration several criteria such as: compliance with the Use test as set in Article 120 of the Level 1 Text; compliance and consistency with the profit and loss attribution as set out in Article 123 of the Level 1 Text; and the economic reality of the business unit.

3.28. In group internal models, CEIOPS expects that a major business unit would typically be a legal entity. However it can be also the examples provided for solo undertakings, sometimes with higher granularity e.g. by geographical location or lines of business in a group perspective (e.g. containing the same business – for example motor insurance – for several legal entities). For groups undertakings the definition of what constitutes a major business unit may be done at group or at solo level, this is to avoid situations where a partial for a major business unit at solo level that adequately reflects the risk profile of that business unit, is not allowed in the group internal model due to that business unit does not fulfil the materiality concept at group level.

3.3 Specific provisions for the approval of partial internal models

3.29. Article 113 sets out specific additional provisions to which undertakings intending to use partial internal models for determining the SCR shall comply to get their model approved.

Justification for the limited scope of the model

3.30. The first specific provision is that the reason for the limited scope of application of the model shall be properly justified by the undertaking. Paragraph 3.123 of CEIOPS Advice on the Procedure to be followed for the approval of an internal model provides some examples of reasons to justify the limited scope of the model[6], *e.g.:*

- partial internal models may represent a transitory step towards a full internal model;
- there may be a lack of reliable information to model other risks/business lines;
- the modelling of other risks/business lines may disproportionate for the nature, complexity and scale of the risks inherent in the business of the undertaking;

[6] This list is not exhaustive

- partial internal models may encourage innovation and specialization to certain business areas;
- mergers and/or acquisitions.

3.31. The scope of application of the internal model needs to be set out by the undertaking in the application process and agreed by the supervisory authority. As mentioned in CEIOPS Advice on the Procedure to be followed for the approval of an internal model, the definition of the scope of application of the internal model is closely linked to the undertaking's policy for model changes. Model scope extensions are by definition outside the model change policy.

3.32. It must be clear that the onus to demonstrate that the limited scope is properly justified lies with the undertaking. To do so, undertakings may wish to supplement their rationale with quantitative evidence. If the supervisory authorities have concerns about the justification of the scope, they retain the power to

a. disagree with undertaking's proposed scope and reject the model,

b. to approve it with conditions,

c. require the undertaking to submit a transitional plan to extend the scope of the model.

3.33. Setting out the scope of the internal model is not a trivial task. Undertakings will wish to make it wide enough to include a sufficient number of uses so as to demonstrate compliance with the use test, but narrow enough to make it clear what falls inside the scope of the internal model and what falls outside the scope.

3.34. A clear definition of the scope of application and coverage of the internal model is also very important from a supervisory perspective, e.g.:

- This would in fact define the boundaries of what is subject to approval (and/or approved). Hence it defines what can be used to calculate the SCR and prevent any potential regulatory arbitrage through cherry-picking. If the boundary is not clear, it may provide the undertaking with the wrong incentives (e.g. selectively modelling risks and lines of business with the sole purpose of obtaining a lower capital requirement than in the standard formula, as opposed to a better reflection of its risk profile and the enhancement of its risk management);
- Public disclosure purposes;
- To establish the baseline for model scope extensions;
- To avoid regulatory arbitrage;
- To establish the baseline for the transitional plan to extend the scope of the model as set out in Article 113(2) of the Level 1 Text, if applicable.

3.35. There should be no ambiguity as to which risks, assets and/or liabilities are included in the scope of the internal model and which are excluded. The definition of the scope shall not include exceptions as these may give

rise to possible ambiguity in the scope, or may allow the exclusion of risks with weaker management.

3.36. This applies both to solo entities as well to groups. However, groups are often complex, covering a variety of geographical locations and lines of business. Deciding on and setting out the scope of an internal model with clear boundaries will pose additional challenges for groups. For example, they are more likely to undergo mergers, acquisitions, spin-offs and restructuring processes.

3.37. A group using the standard formula may end up using a partial internal model for the sole reason that it has acquired a new legal entity that was using an approved internal model (either full or partial). This situation may not be considered as cherry-picking, as it may better reflect the risk profile of undertakings.

3.38. Another example would be a group using a full internal model that has acquired an undertaking that was using the standard formula. In this case, integrating the acquired entity into the model may not be possible within a short time period, or it may disproportionate especially in the cases where the standard formula adequately reflects the risk profile of acquired undertaking.

3.39. In any situation in which a group is using a partial internal model for the sole reason that it has acquired a new legal entity, it should be up to the group to demonstrate that this situation adequately reflects the risks profile of the concerned undertakings and of the group. If it intends to extend the scope of the partial internal model, it should propose a transitional plan to do. However, in both circumstances the supervisory authority may evaluate whether or not a transitional plan to extend the scope of the model should be imposed.

3.40. Additionally, it may be expected that for two legal entities with similar risk profiles, the group would have to calculate the SCR for both in the same manner, irrespectively of whether it is using either the standard formula or an internal model (full or partial). This is notwithstanding with the provisions set out below, as well as other possible factors.

3.41. There are several plausible reasons for excluding particular legal entities from the scope of a group internal model, requiring the supervisory authority to evaluate whether a transitional plan to extend the scope of the model should be imposed. Some of these reasons are presented below, but please note that this is not an exhaustive list:

- The materiality of the legal entities;
- Modelling the excluded legal entities lines may be disproportionate for the nature, complexity and scale of the risks inherent in the business of those entities;
- The number of parameters of the group internal model may become unmanageable for the timely calculation of the SCR;
- There may be a lack of reliable information to model the excluded legal entities;

- The standard formula captures adequately the risk profile of the legal entities and overall the risk profile of the Group is also adequately captured.

3.42. When assessing the undertaking's rationale for the limited scope of its partial internal model, supervisory authorities may take into account, amongst other things, the following factors:

- compliance with the use test as set in Article 120 of the Level 1 Text. Particularly, compliance with Principle 2 of the Use test as defined in CEIOPS Advice on Tests and Standards for internal models approval, i.e. whether the scope of the internal model is consistent with way the business is organized and managed, with the risk management system of the undertaking, and with the governance of the undertakings (including reporting processes and channels);
- consistency with the profit and loss attribution as set out in Article 123 of the Level 1 Text;
- compliance with the validation standards as set out in Article 124 of the Level 1 Text, namely with the assessment of the accuracy, completeness and appropriateness of the data used by the internal model;
- the nature, scale and complexity of the risk inherent in the business undertakings;
- the strategy of the undertakings;
- the existence of a transitional plan to extend the scope of the model;
- the findings from the ORSA process.

3.43. If the supervisory authorities are dissatisfied with the justification provided by undertakings, they may require undertakings to perform specific exercises, if applicable and practicable. Taking into account the proportionality principle, these exercises may encompass running the model with alternative scopes (either larger or smaller) in terms of lines of businesses and/or risk considered and/or integration techniques between the internal model's results and the standard formula's results.

Better reflection of the risk profile

3.44. The second specific provision for the approval of a partial internal model is that the resulting SCR shall reflect more appropriately the risk profile of the undertaking and in particular that it meets the principles set out in Subsection 1 of Section 4 of Chapter VI of the Level 1 Text.

3.45. According to paragraph 3.124 of CEIOPS Advice on the Procedure to be followed for the approval of an internal model, undertakings shall demonstrate that partial internal models reflect their risk profile more appropriately and that the resulting SCR meets the principles set out in the above mentioned Subsection 1, namely going concern assumption, coverage of risks mentioned in Article 101(4), to take into account the effect of risk mitigation techniques provided that credit risk and other risks

arising from the use of such techniques are properly reflected in the SCR and frequency of SCR calculation.

3.46. CEIOPS´ interpretation "*of coverage of risks mentioned in Article 101(4)*" is that the partial internal model coverage in conjunction with the risks and business units covered by the standard formula shall assure the coverage of risks mentioned in Article 101(4). Partial internal models do not necessarily need to cover to the full extent any specific risk mentioned in Article 101(4), because otherwise the last phrase of Article 112(2) – reference to business units, would be always made not applicable (or always only on a temporary basis see paragraph 3.59 of Section 3.4).

3.47. Other principles set out in Subsection 1 are:

- the SCR shall be calibrated so as to ensure that all quantifiable risks to which an undertaking is exposed are taken into account. For information on risks not covered by the standard formula please refer to Section 3.8 of this Advice. As expressed in the Level 2 Advice on Article 121, the undertaking shall demonstrate that the internal model covers all material, quantifiable risks within its scope by using a set of qualitative and quantitative risk indicators;
- it shall cover existing business, as well as the new business expected to be written over the next twelve months;
- with respect to existing business, it shall cover unexpected losses only;
- the SCR shall correspond to the Value-at-Risk of the basic own funds of an undertaking subject to a confidence level of 99.5% over a one-year period.

Integration of partial internal mode result's into the standard formula's results

3.48. The third and final specific provision for the approval of a partial internal model is that the design of the partial internal model is consistent with the principles set out in the referred Subsection 1 so as to allow the partial internal model to be fully integrated into the SCR Standard Formula. Given its importance and implications this specific provision is subject to the impact assessment study on Level 2 implementing measures being carried out by the European Commission. A description of the three policy Options under consideration in the impact assessment is developed in Section 3.5 of this Advice. The impact spreadsheets and narrative are also attached to this document in Annex C.

CEIOPS' Advice

Justification for the limited scope of the model

3.49. The onus to demonstrate that the limited scope is properly justified lies with the undertaking. To do so, undertakings may wish to supplement their rationale with quantitative evidence. If the supervisory authorities have concerns about the justification of the scope, they retain the power to

a. disagree with undertakings proposed scope and reject the model,

b to approve it with conditions

c. require the undertaking to submit a transitional plan to extend the scope of the model

3.50. There shall be no ambiguity as to which risks, assets and/or liabilities are included in the scope of the internal model and which are excluded. The definition of the scope shall not include exceptions as these may give rise to possible ambiguity in the scope, or may allow the exclusion of risks with weaker management. This applies both to solo entities as well to reinsurance and insurance groups (groups).

3.51. A group may end up using a partial internal model for the sole reason that it has acquired a new legal entity. This situation may not be considered as cherry-picking, as it may better reflect the risk profile of undertakings. It should be up to the group to demonstrate that this situation adequately reflects the risks profile of the concerned undertakings and of the group. If it intends to extend the scope of the partial internal model should propose a transitional plan to do. However, the supervisory authority may evaluate whether or not a transitional plan to extend the scope of the model shall be imposed.

3.52. There are several plausible reasons for excluding particular legal entities from the scope of a group internal model, requiring the supervisory authority to evaluate whether a transitional plan to extend the scope of the model shall be imposed. Some of these reasons are presented below, but please note that this is not an exhaustive list:

- The materiality of the legal entities;
- Modelling the excluded legal entities lines may disproportionate for the nature, complexity and scale of the risks inherent in the business of those entities;
- The number of parameters of the group internal model may become unmanageable for the timely calculation of the SCR;
- There may be a lack of reliable information to model the excluded legal entities;
- The standard formula captures adequately the risk profile of the legal entities and the overall risk profile of the Group is also adequately captured.

3.53. When assessing the undertakings rationale for the limited scope of its partial internal model, supervisory authorities may take into account, amongst other things, the following factors:

- compliance with the use test as set in Article 120 of the Level 1 Text;
- consistency with the profit and loss attribution as set out in Article 123 of the Level 1 Text;
- compliance with the validation standards as set out in Article 124 of the Level 1 Text;
- the nature, scale and complexity of the risk inherent in the business undertakings;
- the strategy of the undertakings;
- the existence of a transitional plan to extend the scope of the model;

- the findings from the ORSA process.

3.54. If the supervisory authorities are dissatisfied with the justification provided by undertakings, they may require undertakings to perform specific exercises, if applicable and practicable.

Better reflection of the risk profile

3.55. CEIOPS´ interpretation "*of coverage of risks mentioned in Article 101(4)*" is that the partial internal model coverage in conjunction with the risks and business units covered by the standard formula shall assure the coverage of risks mentioned in Article 101(4). Partial internal models do not necessarily need to cover to the full extent of those risks.

3.4 Transitional plan to extend the scope of a partial internal model

3.56. Article 113(2) states "*when assessing an application for the use of a partial internal model which only covers certain sub-modules of a specific risk module, or some of the business units of a re(insurance) undertaking with respect to a specific risk module, or parts of both, supervisory authorities may require the (re)insurance undertakings concerned to submit a realistic transitional plan to extend the scope of the model. The transitional plan shall set out the manner in which (re)insurance undertakings plan to extend the scope of the model to other sub-modules or business units, in order to ensure that the model covers a predominant part of their insurance operations with respect to that specific risk module*".

3.57. It is important to notice that in these circumstances, supervisory authorities may decide to require a plan to extend the scope. This implies that the request for a transitional plan is not automatic but it is a supervisory option. More precisely, after evaluating the compliance with the partial internal model requirements, supervisory authorities may therefore decide not to require such a plan.

3.58. If supervisory authorities are satisfied that:

- the limited scope of application of the model is properly justified (the undertaking is not "cherry picking");
- the resulting SCR reflects more appropriately the risk profile of the undertaking and in particular meets the principles set out in the referred Subsection 1, and
- its design is consistent with the principles set out in Subsection 1 of the Level 1 Text so as to allow the partial internal model to be fully integrated into the Solvency Capital Requirement Standard Formula.

then the partial internal model may be approved as a permanent solution.

3.59. In addition to the conditions for the partial internal model to be approved as a permanent solution set out above, paragraph 3.217 of CEIOPS Advice on the Procedure to be followed for the approval of an internal model provides further indications of the reasons that may lead to the supervisory autohority request for a transitional plan. For example, there may be concerns about cherry picking, or about the way the internal model is integrated into the standard formula.

3.60. Below is some further explanation of when supervisory authorities may request a transitional plan

- The supervisory authority believes that the limited scope of the partial internal model as applied for by the undertaking is not properly justified by the undertaking. This may include situations where the undertaking has excluded some risks that are material and where similar undertakings are able to model them, taking into account the proportionality principle. Alternatively, this may include situations where the supervisory authority is aware that the undertaking has developed a model to quantify the risk but the undertaking has chosen not to apply for approval for that part of the internal model.
- The supervisory authority is concerned that some or all of the risks and/or business units not within the scope of the partial internal model are not appropriately reflected by the standard formula. This may include, for example, situations where the undertaking has excluded some lines of business that are specific to that undertaking, such as niche business or very specialised classes.

3.61. As set out in CEIOPS Advice on the Procedure to be followed for the approval of an internal model, paragraph 3.220, whenever the supervisory authority requires the undertaking submitting a transitional plan to expand the scope of the model, it shall explain to the undertaking the reasons for this decision and set the minimum scope that the internal model should cover after the implementation of the plan, including which risk sub-modules and which business units are to be included. The supervisory authority shall ensure that the revised scope covers a predominant part of the insurance operations for the risk modules included in the revised scope of the internal model. Details of the contents of the transitional plan may be included in Level 3 guidance.

3.62. The text of paragraph 1c) of Article 113 of the Level 1 Text is very relevant. Too restrictive interpretations of this paragraph will have the effect of disallowing partial modelling for one or more major business units, or only allow as a temporary solution subject to a mandatory transitional plan to extend the scope of the model to the whole business. This will effectively change the Level 1 Text of both Article 112(2) – as mentioned in paragraph 3.43 of this Advice and Article 113(2) - transforming the "*may*" in paragraph 113(2) into a "shall", whenever undertakings do not model all business units or when modelling jointly sub risks that do not fall under the scope of same risk module.

CEIOPS' Advice

3.63.	The request for a transitional plan as set in Article 113(2) is not automatic but it is a supervisory option. More precisely, supervisors, after having evaluated the compliance with the partial internal model requirements, namely with the provisions set out in Article 113(1) may therefore decide not to require such a plan.

3.5 Policy Options regarding the integration of partial internal models

3.5.1 Policy Options of the impact assessment

3.64. The impact assessment aims to identify the most appropriate way to integrate the results of the partial internal model with the results of the standard formula. Three policy Options have been considered.

3.65. For all Options, whenever the direct application of the standard formula correlation matrix:

- is possible (feasibility test) and
- there is no strong evidence that it is inappropriate to integrate the partial internal model's results into standard formula's results (appropriateness test),

the standard formula correlation matrix coefficients shall be used to integrate the partial internal model's results into the standard formula's results.

3.66. If the standard formula correlation matrix is neither feasible nor appropriate, then the policy Options differ as follows:

- Option 1: Integration of partial internal models using only coefficients prescribed by supervisory authorities;
- Option 2: Integration of partial internal models using techniques provided by supervisory authorities or – if these are not possible or there is strong evidence that these are inappropriate - dependency structures and parameters provided by the undertaking.
- Option 3: Integration of partial internal models using dependency structures and parameters provided by the undertaking or – if these are not approved by the supervisory authority - techniques provided by supervisory authorities.

3.67. Details of the feasibility and appropriateness tests are considered in Subsection 3.5.2 below, dealing with the detailed policy Option descriptions.

3.5.2 Detailed policy Option description

3.68. As described above there is a feasibility test, as well as an appropriateness test which is used, in the first instance, to consider whether the standard formula correlation matrix should be used. Furthermore, depending on the Option chosen, these tests may also

need to be applied to the techniques provided by supervisory authorities in Level 3 and/or the dependency structures and parameters provided by the undertaking.

Feasibility test

3.69. The feasibility test for an integration technique is to determine whether it is possible to integrate the partial internal model with the standard formula using the chosen integration technique.

3.70. An example where the feasibility test would not be passed for the standard formula correlation matrix would be where the undertaking models one major business unit and uses the standard formula for another major business unit. In this case, the standard formula correlation matrix does not have a correlation co-efficient reflecting the dependency between the two major business units, and thus the standard formula correlation matrix as an integration technique is not feasible. More examples of this are given in the description of policy Option one below.

Appropriateness test

3.71. The appropriateness test for the integration technique looks at whether it is appropriate to use an integration technique to integrate the partial internal model and the standard formula to produce the SCR for the undertaking. CEIOPS requires that undertakings provide "strong evidence" to the relevant supervisory authority that this integration technique is inappropriate to be allowed to move to the next stage of selecting an integration technique.

3.72. The general principles for assessing inappropriateness are that the resulting SCR does not "more appropriately reflect the risk profile of the undertaking" and/or does not produce an SCR that "meets the principles of Subsection 1 of Section 4 of the Directive", the key ones in this context being:

a. Not all quantifiable risks are taken into account

b. The SCR is not calibrated to VaR 99.5% over one year

3.73. In showing strong evidence, it is up to the undertaking to demonstrate that using the integration technique would produce an SCR that does not meet these principles. More specifically, CEIOPS considers that the process for collating the strong evidence required to show that the general principles listed above are not met shall include at least an analysis of some or all of the following elements:

a. **Equivalence of the SCR**: the resulting SCR is not equivalent to VaR 99.5% over one year. This may include the use of stress and scenario testing to demonstrate that the resulting SCR is not equivalent to VaR 99.5% over one year. The capital charges at a more granular level (e.g. risk module level) shall also correspond to VaR 99.5% over one year.

b. **Risk profile**: the risk profile of the undertaking makes the assumptions underlying the integration technique largely invalid. Deviations in the risk profile could be identified by either qualitative or quantitative methods such as the analysis of ratios or by stress

tests. In addition, the undertaking may have sufficient information about the non-modelled risk and its relationship to the modelled risk to demonstrate that the integration technique is invalid. In these circumstances a supervisory authority will need to consider carefully whether the undertaking should be required to extend the scope of the model to cover the non-modelled risk so that the relationship claimed is subject to the full standards and governance requirements of the modelling regime.

c. **Data**: The undertaking may have additional data or other evidence that allows analysis of the correlations and shows a different relationship. This data may be specific to the undertaking, or may relate to market evidence related to the co-dependencies between risks affecting that particular undertaking. In many cases, this data may also be linked to other elements used to show the strong evidence, specifically, the data may show that the risk profile varies from that assumed by the standard formula.

   An example of this is given below:

   An undertaking may have information about how the modelled risk will react to large changes in the un-modelled risk. Consider a life undertaking, mainly selling investment type products to institutional investors. The undertaking models its lapse risk, as the risk profile of the behaviour of institutional investors is different to that of the risk profile assumed in the standard formula for lapses.

   Assume the undertaking invests mainly in non-complex assets and that the standard formula is therefore appropriate for the market risk which is not modelled. Even though the undertaking does not model its market risk, it may still have quantitative and qualitative information about how the policyholders have behaved in past market conditions, including extreme conditions. The undertaking will therefore have data, which along with a qualitative analysis including expert judgement, may provide enough evidence to determine a dependency structure between the modelled and non-modelled risks.

d. **Use test:** The fact that an undertaking uses a different integration technique alone does not constitute enough evidence to reject the standard formula. It will always have to be supplemented by further analysis, which may include elements such as those set out in a) to c) above.

   The rationale of the Use test[7] sets out that supervisors can take additional comfort if the internal model is used by the undertaking. This rationale extends to parts of the internal model, including the integration technique Thus if undertakings use another integration technique, the supervisory authority may take some comfort as to the appropriateness of this integration technique. The higher the degree of modelling freedom given to undertakings the higher the emphasis put on the use test. For the purposes of this issue, the use test is a necessary but not sufficient condition.

[7] Ref to Section 3.3.1 of CEIOPS Advice on Tests and Standards for internal models approval

3.74. CEIOPS recognises that it would be difficult for the standard formula correlation matrix, or for any integration technique, to meet all of the above criteria perfectly. Therefore, CEIOPS considers that it shall only be possible to reject the integration technique where the analysis of the items above concludes that the evidence to reject the standard formula correlation matrix is strong.

3.75. The undertaking shall perform a self assessment from the analysis of the above elements to determine whether the evidence is strong or not. The appropriateness test is subject to the usual model validation requirements set out in CEIOPS Advice on Tests and Standards for internal models approval. When determining the strength of the evidence, undertakings may use both quantitative and qualitative indicators to gauge the strength of the evidence.

3.76. If the supervisory authority is of the opinion that the strong evidence shown by the undertaking is not appropriate, the supervisory authority may force the undertaking to use the standard formula's integration technique to integrate the partial internal model with the standard formula.

Option 1

3.77. Whenever the direct application of the standard formula correlation matrix:

- is possible (feasibility test) and
- there is no strong evidence that it is inappropriate to integrate the partial internal model's results into the standard formula's results (appropriateness test),

the standard formula correlation matrix shall be used to integrate the partial internal model's results into the standard formula's results.

3.78. If the direct application of the standard formula correlation matrix fails the feasibility test, the supervisory authorities shall decide which coefficients shall be applied. In these circumstances, the coefficients prescribed by supervisory authorities shall have to be consistent with Subsection 1 of Section 4 of Chapter VI of the Level 1 Text to allow the partial internal model to be fully integrated in the SCR standard formula and shall have to comply with the standards set out in Articles 120 to 125 and adequately and appropriately reflect the risk profile of the undertaking. The adaptation to be made to the use test in this case is that scope of the use test will be the same as the partial model, that is, the use test is not applicable to the integration technique prescribed by the supervisory authority.

3.79. Examples of this would be when modelling two or more risk modules jointly (Annex A – example 1c)), modelling two risk sub-modules jointly (Annex A – examples 3b1) and 3b2)), different risk categorization than in standard formula (Annex A – example 5), modelling risks not covered by the standard approach (Annex A – example 6), not modelling all lines of business for risk modules/sub modules modelled (Annex A - examples 10 to 17). Further examples are provided in Annex B.

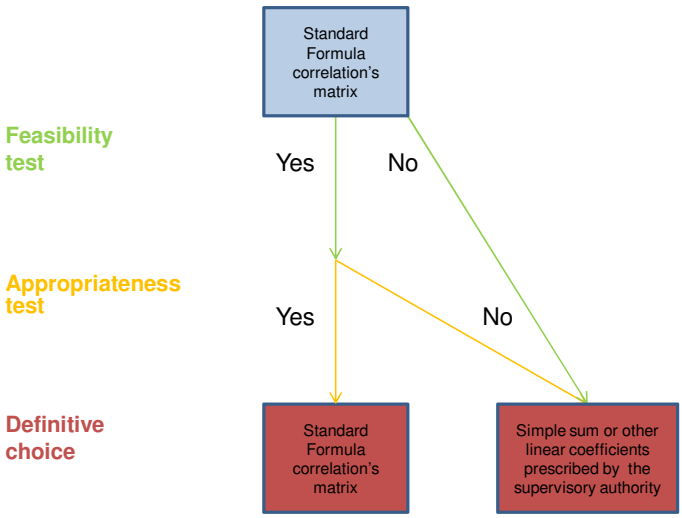
3.80. If the standard formula correlation matrix is possible, this will typically occur when

- the partial internal model follows the same risk categorization and modular structure as the standard formula; and
- within the limited scope of the partial internal model all lines of business are modelled (Annex A – examples 1a), 1b), 2a), 2b), 3a1), 3a2) and 4)).

3.81. If the standard formula correlation matrix passes the feasibility test, the undertaking must consider the appropriateness of the standard formula, as set out in the Subsection dealing with the appropriateness test. If the application of the standard formula correlation matrix is possible but not appropriate, supervisory authorities will decide which coefficients the undertaking shall apply. These may vary from simply assuming no diversification benefits between the partial internal model's results and results from the standard formula (in most cases simply summing the results, i.e. assuming a linear correlation equal to one), to prescribing a different coefficient. In these circumstances, the coefficients prescribed by supervisory authorities shall have to be consistent with the referred Subsection 1 of Section 4 of Chapter VI of the Level 1 Text so to allow the partial internal model to be fully integrated in the SCR standard formula and shall have to comply with the standards set out in Articles 120 to 125 and adequately and appropriately reflect the risk profile of the undertaking.

3.82. The decision tree to be followed in this process is illustrated bellow.

Option 1: decision tree on partial models' integration



3.83. If the standard formula correlation matrix is neither feasible nor appropriate, it is impossible to identify *a priori* the most suitable integration technique applicable to every possible case. Therefore, some degree of flexibility should be allowed to supervisory authorities. Several factors may be taken into account[8]:

- The nature, scale and complexity of the risks inherent in the business of the undertakings;
- The joint behaviour of the risks and/or lines of business modelled under the internal model and under the standard formula;
- The potential scale of the diversification effects between the risks that fall under scope of the partial internal model and that which is not modelled;
- The marginal behaviour of the risks and/or lines of business modelled under the internal model and under the standard formula;
- The information available (i.e. data and expert judgment);
- The business model of the undertakings;
- The risk ranking ability of the model after the integration with the standard formula;
- The analysis of specific stress scenarios;
- The existence of plans to extend the scope of application of the model (e.g. either to a full internal model or to a level where it could be easily integrated into the standard formula).

Option 2

3.84. As in Option 1, whenever the direct application of the standard formula correlation matrix:

- is possible (feasibility test) and
- there is no strong evidence that it is inappropriate to integrate the partial internal model's results into standard formula's results (appropriateness test),
- the standard formula correlation matrix shall be used to integrate the partial internal model's results into the standard formula's results.

3.85. If the direct application of the standard formula correlation matrix is not possible or if the supervisory authority is satisfied that there is strong evidence that it is inappropriate, the undertakings shall use one of the integration techniques that will be provided by CEIOPS in its Level 3 guidance.

[8] This is not an exhaustive list

Criteria for choosing from the list:

3.86. CEIOPS does not wish the selection process followed by undertakings to be unduly onerous. CEIOPS considers that Solvency II is an enabling measure, and that undertakings should be encouraged to develop internal models that reflect their risk profile. This naturally includes the development of partial internal models, whether as a permanent Option or as part of the development of a full internal model. CEIOPS' Advice on the approach to choosing a technique from the Level 3 list reflects this view - if the approach is unduly burdensome, this may discourage smaller undertakings from applying to use an internal model to calculate the SCR. In CEIOPS' opinion, this would be disproportionate. CEIOPS proposes a two-stage process for selection from the list.

Step a)

3.87. CEIOPS considers that undertakings should:

a. review the full Level 3 list of integration techniques to ensure they are familiar with each of them at a high level, and consider the advantages and disadvantages of each; and

b. review the circumstances in which each integration technique is or is not appropriate, and assess whether and how these circumstances apply in their case.

3.88. This initial review should allow undertakings to identify a short-list of one or more appropriate integration techniques. In the event that none of the listed integration techniques is identified as appropriate, undertakings move to the next stage of this Option. Supervisory authorities may require the undertaking to test alternative integration techniques and provide strong evidence that such integration techniques are inappropriate in order to prevent cherry-picking.

Step b)

3.89. Assuming that one or more integration techniques can be identified, undertakings will need to carry out a more in-depth review of the short-listed integration techniques. CEIOPS expects that undertakings would assess the integration techniques under the following headings:

a. Does the resulting SCR reflect the risk profile of the undertaking, including whether the resulting calibration reflects the Solvency II standard for the SCR;

b. What data and expert judgement is needed;

c. How the integration techniques allow capital allocation and ranking of risks across the SCR;

d. How the integration techniques link to the risk management system and other uses of the internal model;

3.90. Undertakings can then make a decision as to the appropriate integration technique from the short list for their risk profile. Undertakings need to document the process and rational behind their choice.

Appropriateness of the integration technique chosen.

3.91. Once the undertaking has chosen an integration technique from the list, the undertaking shall test whether there is strong evidence that the integration technique chosen is inappropriate. The testing for strong evidence is as described in the appropriateness test, set out in paragraphs 3.68 to 3.74.

3.92. CEIOPS is aware of the danger of the undertaking specifically choosing a integration technique where the undertaking can show that it is inappropriate, as this will allow the undertaking to be able to consider their own integration technique. Thus, the supervisory authority may require the undertaking to test any of the other integration techniques listed by CEIOPS against the strong evidence.

Characteristics of the integration techniques.

3.93. These techniques shall aim to replicate the properties of the integration techniques used in the Standard Formula (which themselves attempt to comply with the principles in Subsection 1 of Section 4 of the Level 1 Text) when the structure of the partial internal model does not fit the standard formula correlation matrix. CEIOPS recognises that one of the main benefits to undertakings of the list of techniques is that it will potentially reduce costs in respect of developing integration techniques. For this reason, the Level 3 guidance will aim to be as precise as possible as to the application of the integration technique. The level of expert judgment incorporated in the application of the techniques will vary, the application of some techniques will have none to few expert judgment, whereas the application of other will incorporate a higher degree of expert judgment. It is stressed once more that these techniques do not apply for the aggregation of results within the limited scope of the partial internal model.

3.94. The aim of the Level 3 list of integration techniques is to provide CEIOPS with assurance that undertakings are using an appropriate approach to integrating the partial internal model and the standard formula. However, CEIOPS wishes to strike a balance between prescription of integration techniques, which may undermine the Use test, and complete flexibility, which may lead to scope for cherry-picking. However, undertakings should remain aware of

a. the need to comply with the appropriateness test;

b. the need to comply with the tests and standards, as adapted for the integration technique; and

c. that the supervisory authority will review the selected integration technique to be assured that it is indeed one of the Level 3 integration techniques.

3.95. When an undertaking chooses an integration technique from the Level 3 list, the integration technique shall be followed as set out in the Level 3 description. Undertakings should regard the academic and actuarial literature as helpful references and assess how the integration technique will be applied by them.

3.96. This Option gives CEIOPS the responsibility of managing a list of techniques capable of producing a result that is consistent with the principles set out in Subsection 1 of Section 4 of the Level 1 Text.

Criteria and process for adding techniques to the list

3.97. CEIOPS recognises that it will be important to keep the Level 3 list of integration techniques up to date, taking into account information gained by supervisory authorities about new integration techniques, or refinements to integration techniques, as part of their assessment of internal models and as part of the supervisory review process. CEIOPS will review the list annually and will make amendments in line with current best practice and research. This may include removing techniques from the list. If an undertaking uses a technique no longer on the list the supervisory authority sets a transition period in which the technique may still be used. In its decision the supervisory authority will give particular emphasis on the available resources, the potential consequences of a continued use on the reflection of the undertaking's risk profile and the proportionality principle.

3.98. However, CEIOPS recognises that the insurance industry will wish to develop new techniques for integrating, and many of these will be applicable to the integration of partial internal models and the standard formula. This is in line with the Foundation Principle of the Use test, and CEIOPS very much encourages innovation. CEIOPS can envisage a situation where an undertaking develops a new integration technique and wishes to have this included in the Level 3 list.

3.99. If the information required is provided by the undertaking, CEIOPS does not foresee major problems with including new integration techniques. CEIOPS may review any proposed integration techniques against the following criteria:

a. Is the technique a completely new technique, or a derivation of techniques already listed? In the latter case, the Level 3 list could be amended rather than added to;

b. How extensively the technique is used;

c. The effectiveness of the technique in producing an appropriately calibrated, risk reflecting result;

d. Whether the technique could be widely used;

e. The data requirements and need for expert judgement;

f. The quality of the academic and actuarial references.

3.100. The aim of the Level 3 guidance on each technique is to give undertakings enough information to choose an appropriate technique for integration and then apply it in a way that reflects their own risk profile and also is proportionate to the nature, scale and complexity of their risks.

3.101. For each integration technique, CEIOPS will set out in the Level 3 guidance the following, this may not be an exhaustive list:

a. The name of the technique

b. A brief outline describing the technique including

   i. The main data requirements (we may need to expand this and link to Article 121)

   ii. The areas needing expert judgement (link to Article 121)

   iii. The calculation method

c. References to any academic / actuarial literature that describes the technique, with pointers to the relevant sections of the literature.

d. The advantages of the technique

e. The disadvantages of the technique

f. The circumstances when the technique is inappropriate

3.102. It should be noted that CEIOPS' responsibility for maintaining this list does not diminish the responsibility of undertakings to assess the appropriateness of the particular integration technique chosen and to justify this in the application to use an internal model. The ongoing appropriateness will also form part of the validation standards required for the internal model. The integration techniques listed at Level 3 will be mathematical methods, each with pros and cons, and drawbacks.

3.103. CEIOPS provides Advice on the adaptations of the tests and standards for internal models in respect of the integration technique between the partial internal model and the standard formula in Section 3.7. CEIOPS recognises that this proposed approach to selecting an integration technique does have an element of restriction on undertakings by requiring them first to choose from a list of techniques specified by CEIOPS. However, CEIOPS also considers that

a. as the list is updated to reflect current practice,

b. as the list can be updated quickly and

c. as the descriptions of integration techniques are flexible enough to allow the integration technique to be applied to different undertakings,

undertakings can be expected to apply the tests and standards, in cases where the integration technique is selected from the Level 3 list.

3.104. When none of the techniques provided in the Level 3 guidance is feasible or if the undertaking is unable to select an appropriate integration technique from the list after following the process described above, undertakings may use, subject to supervisory approval, other integration techniques as in Option 3. Supervisory authorities always retain the power to

a. disagree with undertaking's integration technique and reject the model;

b. to approve it with terms and conditions;

c. require the undertaking to submit a transitional plan to extend the scope of the model to the level where it can be integrated in a

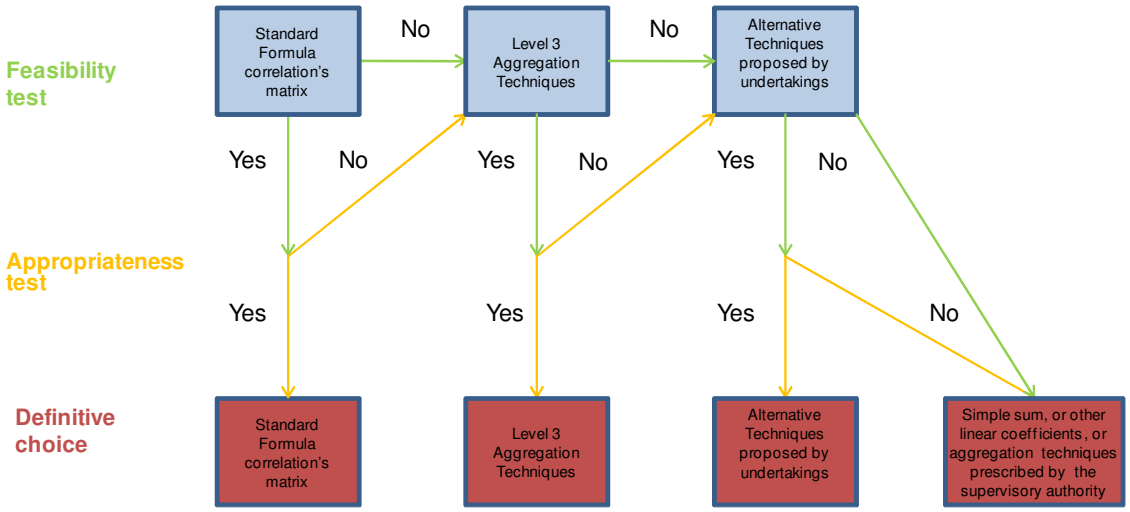
straightforward manner with the standard formula or so that another integration technique might be used.

This is in order to ensure that the design of the partial internal model is not chosen on purpose in order to make all the techniques provided in the Level 3 guidance inapplicable.

3.105. If the undertaking fails to demonstrate that the proposed integration techniques comply with all the provisions set on the previous paragraph, then the supervisory authority shall decide how the partial internal model is integrated. In doing so, supervisory authorities shall also take into account the considerations expressed under Option 1. However, compared to Option 1, under Option 2 the supervisory authority's choice is not limited to linear correlations coefficients (including simple sum of results).

3.106. The decision tree to be followed in this process is illustrated below.

Option 2: decision tree on partial models' integration



3.107. When assessing the proposed integration technique supervisory authorities may take into consideration the factors mentioned in paragraph 3.81, amongst other.

Option 3

3.108. As in Option 1, whenever the direct application of the standard formula correlation matrix:

- is possible (feasibility test) and
- there is no strong evidence that it is inappropriate to integrate the partial internal model's results into standard formula's results (appropriateness test),

the standard formula correlation matrix shall be used to integrate the partial internal model's results into the standard formula's results.

3.109. Otherwise, undertakings may use, subject to supervisory approval, other integration techniques, as long as their design is consistent with the

referred Subsection 1 of Section 4 of Chapter VI of the Level 1 Text so to allow the partial internal model to be fully integrated in the SCR standard formula. The integration techniques shall also have to comply with the standards set out in Articles 120 to 126, particularly with the use test, so as to adequately and appropriately reflect the risk profile of undertakings.

3.110. Supervisory authorities always retain the power to

a. disagree with undertakings proposed integration technique and reject the model

b. to approve it with conditions,

c. require the undertaking to submit a transitional plan to extend the scope of the model to the level where it could be easily integrated with the standard formula.

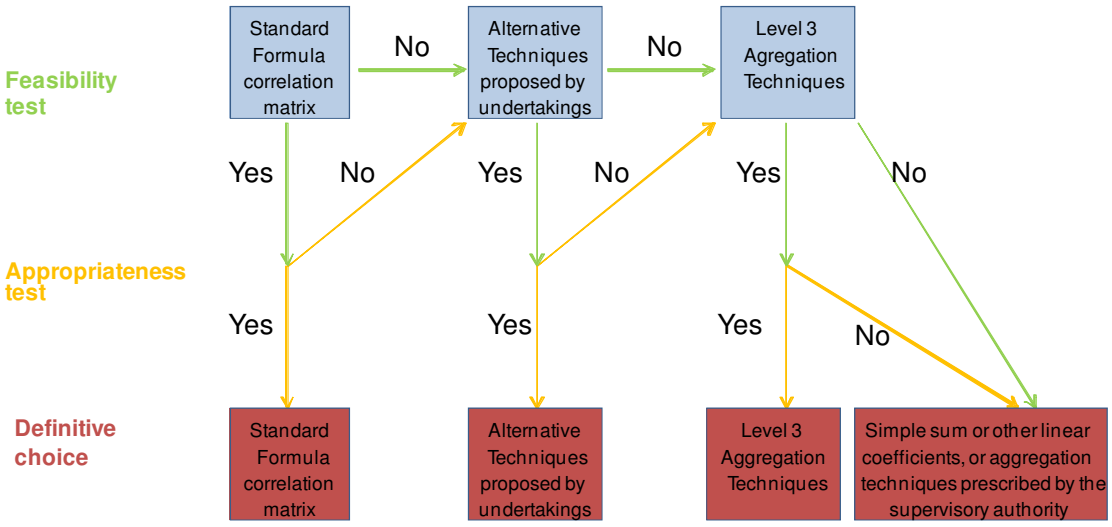
3.111. If the undertaking fails to demonstrate that the proposed integration techniques comply with all the provisions set out in the paragraph 3.88 and therefore are not approved by the supervisory authority, or if the undertaking is unable to develop a suitable integration technique, the undertaking will then use an integration technique from a list prescribed by CEIOPS in Level 3 guidance, as defined in Option 2 above. The criteria for choosing from the list and the characteristics of the technique described in the list are the same as those which have been set out in Option 2 above.

3.112. If none of the techniques provided in the Level 3 guidance is feasible or if the undertaking is unable to select an appropriate technique from the list after the appropriateness test described above in paragraph 3.70, then the supervisory authority shall decide how the partial internal model shall be integrated with the standard formula. In doing so, supervisory authorities shall also take into account the considerations expressed under Option 1. However, compared to Option 1, under Option 3 the supervisory authority's choice is not limited to linear correlations coefficients (including simple sum of results).

3.113. When assessing the proposed integration technique supervisory authorities may take into consideration, amongst other, the factors mentioned in paragraph 3.81.

3.114. The decision tree to be followed in this process is illustrated below.

Option 3: decision tree on partial models' integration



3.5.3 Discussion of policy Options

3.115. This Section describes the pros and cons of each Option, the industry likely response and assesses what in CEIOPS view is the most appropriate Option. This Section is a summary of the impact assessment study. For further details please refer to Annex B.

3.5.3.1 Cost and benefits

Option 1

3.116. The main advantages of Option 1 is that it is a straightforward approach to apply for undertakings with no modelling cost associated (as the supervisory authority is responsible to choose the integration technique) and easy to assess and compare for supervisory authorities.

3.117. This Option however presents several important disadvantages both for undertakings, supervisory authorities and policyholders.

3.118. For example, when the integration of partial internal model results with the standard formula results by applying the standard formula correlation matrix is neither possible nor appropriate, supervisory authorities shall have to identify and prescribe the way the internal model's results are integrated, either assuming no diversifications benefits or by identifying different coefficients. The most significant risk is that the final solution may not adequately capture the risk profile of the undertakings leading to an inappropriate SCR calculation. These concerns can be mitigated by requiring the undertaking to submit a transitional plan to extend the scope of the model up to a level where the internal model can be more adequately integrated.

3.119. However, as explained before, always requiring a transitional plan, especially in those circumstances when supervisory authorities do not possess the resources or knowledge to find a more appropriate solution, may not be proportionate with respect to the nature, scale and complexity of the risks inherent in the business of the undertakings. This may ultimately discourage innovation, the development of partial

internal models and, consequently, the enhancement of risk management. Potentially, undertakings may be faced with only two Options: either to develop partial internal models with a structure similar to the standard formula's risk modules, or to move towards full internal modelling. In most circumstances, this will simply discourage undertakings from developing partial internal models.

3.120. Option 1 may also create some competitive distortions, leading to situations where some undertakings will have to hold inappropriate levels of capital. In some cases too little, whereas in some others too much. These distortions and inefficiencies across the insurance industry may ultimately create an uneven playing field.

3.121. This Option is also likely to have negative impacts on supervisory authorities. First of all, the prescription of a limited number of integration techniques (not say in many cases just one: to sum up the results) irrespectively of the models' structures and specificities would almost certainly contribute to an increase in systemic risk.

3.122. Additionally, this would impose a significant burden and reputational risk (e.g. when the integration technique is proven to be inappropriate) on supervisory authorities, as they would have to be able to identify and prescribe correlations coefficients where it is not possible to use the ones from the standard formula. For example, for those risks not covered by the standard formula or where it is deemed not appropriate. Although this problem may be overcome by choosing simple and so called "prudent" solutions, the risks related to the miscalculation of the SCR, competitive distortions and inefficiencies (i.e. a uneven playing field) will be difficult to mitigate. Moreover, internal models are expected to evolve, and changes in internal models may lead to the need for changes in the correlation matrices, exacerbating the resources requirements.

3.123. Finally, within each member state the risk of regulatory arbitrage is low under Option 1. However the situation at European Level may be different unless adequate coordination techniques are established between supervisory authorities.

3.124. If an inappropriate integration technique arising from the application of Option 1 leads to an inadequate SCR, this would also have a negative effect on policyholders. An inadequately low SCR will lead to a lower level of policyholders' protection, whereas the cost of an SCR which is too high might be passed on policyholders in the form of higher premiums.

Option 2

3.125. Option 2 gives undertakings more modelling freedom than Option 1 but less than Option 3. This is preferable if the additional flexibility of Option 3 does not result in a more adequate calculation of the SCR. Under this assumption Option 2 is the best way to achieve a level playing field as the use of defined techniques ensures an equal treatment. If the assumption does not hold it may create some competitive disadvantages. Nevertheless, those disadvantages are partially mitigated by the fact that whenever the integration techniques significantly deviate from the risk profile of an undertaking, the undertaking is allowed to use its own integration technique subject to supervisory approval.

3.126. Regarding undertakings, Option 2 overall also has the advantage of lower modelling costs than Option 3 as, in many circumstances, undertakings will apply techniques to be provided by CEIOPS. However, the restrictions that these Options impose may discourage innovation.

3.127. The prescription of an integration technique may create systemic risk. Yet systemic risk also arises if many undertakings are on the same side when modelling risks (e.g. as was seen recently with the modelling of credit risk associated with subprime assets). This risk is partially mitigated with regular update of the list of techniques taking into account the experience gathered from its application and market developments and also in the situations in which the undertaking is allowed to develop its own technique, subject to supervisory approval.

3.128. With Option 2 CEIOPS has the responsibility to manage a list of techniques consistent with the standard formula. In addition the supervisory authority has to judge the appropriateness of the chosen technique. Yet assessing techniques developed by the undertakings in Option 3 may be probably even more burdensome.

3.129. All Options involve some reputational risk: it neither helps to prescribe an inadequate technique nor to accept one developed by the undertaking. Option 2 causes reputational risk if the prescribed techniques are inadequate. However this risk is partially mitigated by the fact that whenever those integration techniques significantly deviate from the risk profile of an undertaking, the undertaking is allowed to use its own integration technique subject to supervisory approval. Additionally the fact that the list of techniques will be periodically assessed taking into account the experience gathered from its application and market developments will also mitigate this risk.

3.130. Finally, the risk of regulatory arbitrage is low under Option 2, given the list of techniques to be issued by CEIOPS at Level 3 Guidance and that whenever there is strong evidence that application of those techniques is inappropriate undertakings are allowed to use their own techniques subject to supervisory approval.

3.131. Under the assumption that the risk profile of undertakings is adequately captured, ultimately leading to a more adequate calculation of the SCR this Option will have a permanent positive impact on policy holders.

Option 3

3.132. Option 3 gives undertakings the highest degree of modelling freedom. This may allow undertakings to capture more appropriately their risk profile than with the other Options, ultimately leading to a more adequate calculation of the SCR. Modelling costs are higher than in Option 1 and 2, nevertheless if an undertaking is unable to develop a suitable integration technique it will apply the techniques already developed by CEIOPS.

3.133. Under this assumption Option 3 will increase the likelihood of a level playing field being achieved and maintained and reduce systemic risk and will minimize reputational risk for supervisory authorities.

3.134. Still under this assumption this policy Option will have a permanent positive impact on policy holders, namely in terms of premium charged and policyholder protection.

3.135. As Option 3 is harder to assess and compare for supervisory authorities than the other Options supervisory convergence may be more difficult to achieve. In addition the risk of regulatory arbitrage may be higher than in Options 1 and 2. This may be solved by issuing principles and further guidance. If the higher modelling freedom results in a more precise calculation of the SCR and supervisory convergence can be achieved Option 3 will lead to an outcome-focused consistency between supervisory actions preferable to the process-focused consistency of Options 1 and to a lesser extent Option 2.

3.5.3.2 Likely Industry response

3.136. Industry will likely prefer Option 3 as it provides the highest degree of modelling freedom and they believe that this would be the most effective way to adequately capture undertaking's risk profile and to reduce systemic risk. From this perspective Option 1 is the least desirable while Option 2 lies in between Option 1 and Option 3. Option 2 may be also attractive for SMEs.

3.137. From an industry perspective the main advantage of Options 1 and 2 are the lower modelling costs.

3.138. If the higher modelling freedom of Option 3 resulted in a more accurate SCR calculation choosing other Options would be perceived by the industry as a disincentive for the use of partial internal models. This would have a negative impact whenever there are significant diversification benefits between the risks and lines of businesses that fall under the scope of the internal model and the remainder of the risks and/or lines of business. This may be an issue for multinational groups, reinsurance undertakings and composite undertakings. It would also be an issue for SMEs by discouraging innovation and specialization. In some cases it might also force SMEs to choose between a potentially inappropriate partial internal model and a potentially more inappropriate standard formula.

3.139. Regarding Option 2, industry may raise some issues about the list of techniques to be prescribed at Level 3 guidance. They could argue that short lists may raise the level of systemic risk, while long lists may make the task of choosing the technique unduly burdensome and will make it very difficult to allow for situations in which undertakings are allowed to use their own integration techniques, which will discourage the development of other integration techniques. Therefore striking an adequate balance on how Option 2 will work on practice would be a critical point for the industry.

3.140. Industry will also disagree, especially in the situations where undertakings are able to develop and justify an appropriate technique, for having to use a prescribed technique unless the application of this former will result in a significant deviation from their risk profile.

3.141. In any circumstance the industry may fear that supervisors start prescribing the same type of integration technique for the part that is

actually modelled within the limited scope of the model (even though there is nothing in this Consultation Paper to substantiate such concerns). Industry may also perceive Option 2 as diminishing the importance of the use test.

3.5.3.3 Assessment of policy Options

3.142. The integration of partial internal models falls under the scope of several relevant operational objectives, i.e.:

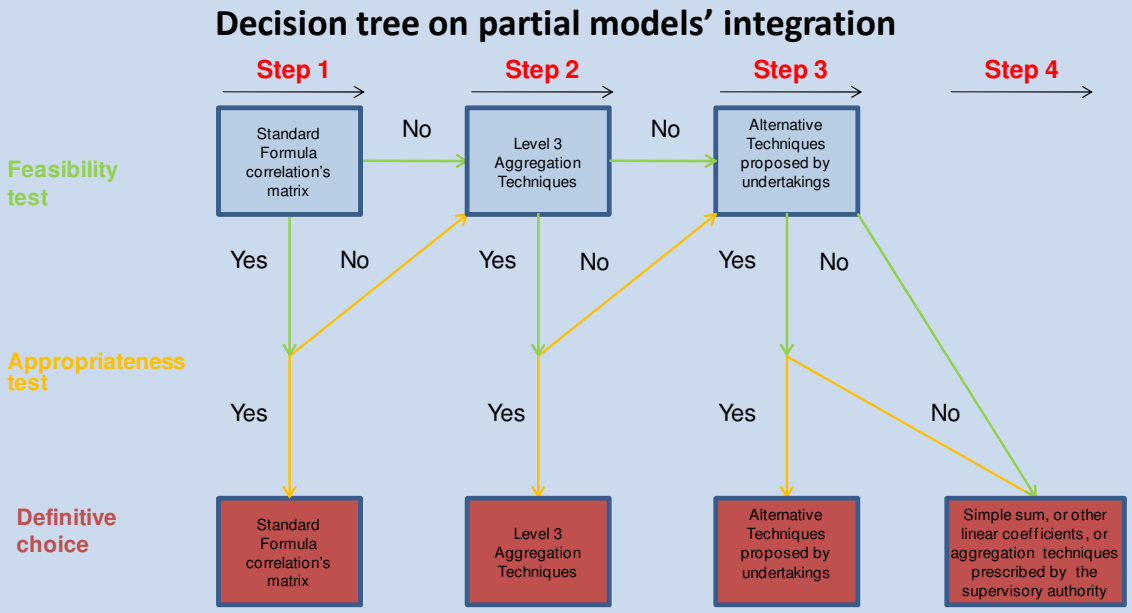
- "introduce risk-sensitive harmonized solvency standards";
- "harmonise supervisory powers, methods and tools";
- "introduce proportionate requirements for small undertakings"; and
- "ensure efficient supervision of insurance groups and financial conglomerates".

3.143. The comparison and ranking of the policy Options is based on the effectiveness and efficiency of each of them in reaching the referred objectives. It also takes into account the level of sustainability and consistency of the policy Options. The detailed assessment is presented in Annex C.

3.144. Taking into account the potential cost and benefits for policyholders and beneficiaries, undertakings and supervisory authorities, the effectiveness and efficiency level to meet the relevant objectives, and its sustainability and comparability level CEIOPS recommends Option 2.

CEIOPS' Advice

3.145. The integration of partial internal models' results into the standard formula's results shall follow the multi-step procedure described below.



Step 1

3.146. Whenever the direct application of the standard formula correlation matrix:

- is possible (feasibility test) and
- there is no strong evidence that it is inappropriate to integrate the partial internal model's results into the standard formula's results (appropriateness test),

the standard formula correlation matrix shall be used to integrate the partial internal model's results into the standard formula's results.

Feasibility test

3.147. The feasibility test for an integration technique is to determine whether it is possible to integrate the partial internal model with the standard formula using the chosen integration technique.

Appropriateness test

3.148. The appropriateness test for the integration technique looks at whether it is appropriate to use an integration technique to integrate the partial internal model and the standard formula to produce the SCR for the undertaking. CEIOPS requires that undertakings provide "strong evidence" to the relevant supervisory authority that this integration technique is inappropriate to be allowed to move to the next stage of selecting an integration technique.

3.149. The general principles for assessing inappropriateness are that the resulting SCR does not "*more appropriately reflect the risk profile of the undertaking*"[9] and/or does not produce an SCR that "*meet the principles*

[9] Article 111.1(b)

of Subsection 1 of Section 4 of the Directive", the key ones in this context being:

a. Not all quantifiable risks are taken into account

b. The SCR is not calibrated to VaR 99.5% over one year

3.150. In showing strong evidence, it is up to the undertaking to demonstrate that using the integration technique would produce an SCR that does not meet these principles. More specifically, CEIOPS considers that the process for collating the strong evidence required to show that the general principles listed above are not met shall include at least an analysis of some or all of the following elements:

a. **Equivalence of the SCR**: the resulting SCR is not equivalent to VaR 99.5% over one year. This may include the use of stress and scenario testing to demonstrate that the resulting SCR is not equivalent to VaR 99.5% over one year. The capital charges at a more granular level (e.g. risk module level) shall also correspond to VaR 99.5% over one year.

b. **Risk profile**: the risk profile of the undertaking makes the assumptions underlying the integration technique largely invalid. Deviations in the risk profile could be identified by either qualitative or quantitative methods. In addition, the undertaking may have sufficient information about the non-modelled risk and its relationship to the modelled risk to demonstrate that the integration technique is invalid. In these circumstances a supervisory authority will need to consider carefully whether the undertaking shall be required to extend the scope of the model to cover the non-modelled risk so that the relationship claimed is subject to the full standards and governance requirements of the modelling regime.

c. **Data**: The undertaking may have additional data or other evidence that allows analysis of the dependency structure and shows a different relationship. This data may be specific to the undertaking, or may relate to market evidence related to the co-dependencies between risks affecting that particular undertaking. In many cases, this data may also be linked to other elements used to show the strong evidence, specifically, the data may show that the risk profile varies from that assumed by the standard formula.

d. **Use test**: The fact that an undertaking uses a different integration technique alone does not constitute enough evidence to reject the standard formula. It will always have to be supplemented by further analysis, which may include elements such as those set out in a) to c) above. For the purposes of this issue, the use test is a necessary but not sufficient condition.

3.151. CEIOPS recognises that it would be difficult for the standard formula correlation matrix, or for any integration technique, to meet all of the above criteria perfectly. Therefore, CEIOPS considers that it shall only be possible to reject the integration technique where the analysis of the items above concludes that the evidence to reject the standard formula correlation matrix is strong.

3.152. The undertaking shall perform a self assessment from the analysis of the above elements to determine whether the evidence is strong or not. The appropriateness test is subject to the usual model validation

requirements set out in CEIOPS Advice on Tests and Standards for internal models approval. When determining the strength of the evidence, undertakings may use both quantitative and qualitative indicators to gauge the strength of the evidence.

3.153. If the supervisory authority is of the opinion that the strong evidence shown by the undertaking is not appropriate, the supervisory authority may force the undertaking to use the standard formula's integration technique to integrate the partial internal model with the standard formula.

Step 2

3.154. If the direct application of the standard formula correlation matrix is not possible or if the supervisory authority is satisfied that there is strong evidence that it is inappropriate, the undertakings shall use one of the integration techniques that will be provided by CEIOPS in its Level 3 guidance.

Criteria for choosing from the list:

3.155. CEIOPS proposes a two-stage process for selection from the list.

Step a)

3.156. CEIOPS considers that undertakings shall:

a. review the full Level 3 list of aggregation techniques to ensure they are familiar with each of them at a high level, and consider the advantages and disadvantages of each; and

b. review the circumstances in which each technique is or is not appropriate, and assess whether and how these circumstances apply in their case.

3.157. This initial review shall allow undertakings to identify a short-list of one or more appropriate techniques. In the event that none of the listed techniques is identified as appropriate, undertakings move to the next stage of this Option. Supervisory authorities may require the undertaking to test alternative techniques and provide strong evidence that such techniques are inappropriate in order to prevent cherry-picking.

Step b)

3.158. Assuming that one or more techniques can be identified, undertakings will need to carry out a more in-depth review of the short-listed techniques. CEIOPS expects that undertakings would assess the techniques under the following headings:

a. Does the resulting SCR reflect the risk profile of the undertaking, including whether the resulting calibration reflects the Solvency II standard for the SCR;

b. What data and expert judgement is needed;

c. How the techniques allow capital allocation and ranking of risks across the SCR;

d. How the technique links to the risk management system and other uses of the internal model;

3.159. Undertakings can then make a decision as to the appropriate technique from the short list for their risk profile. The undertaking need to document the process and rationale behind their choice.

Appropriateness of the technique chosen

3.160. Once the undertaking has chosen a technique from the list, the undertaking shall test whether there is strong evidence that the technique chosen is inappropriate. The testing for strong evidence is as described in the appropriateness test, set out in paragraphs 3.146 to 3.152.

3.161. CEIOPS is aware of the danger of the undertaking specifically choosing a technique where the undertaking can show that it is inappropriate, as this will allow the undertaking to be able to consider their own integration technique. Thus, the supervisory authority may require the undertaking to test any of the other techniques listed by CEIOPS against the strong evidence.

Characteristics of the techniques.

3.162. These techniques shall aim to replicate the properties of the integration techniques used in the Standard Formula when the structure of the partial internal model does not fit the standard formula correlation matrix. CEIOPS recognises that one of the main benefits to undertakings of the list of techniques is that it will potentially reduce costs in respect of developing integration techniques. For this reason, the Level 3 guidance will aim to be as precise as possible as to the application of the integration technique. The level of expert judgment incorporated in the application of the techniques will vary, the application of some techniques will have none to few expert judgment, whereas the application of other will incorporate a higher degree of expert judgment. It is stressed that these techniques do not apply for the aggregation of results within the limited scope of the partial internal model.

3.163. The aim of the Level 3 list of techniques is to provide CEIOPS with assurance that undertakings are using an appropriate approach to integrating the partial internal model and the standard formula. However, CEIOPS wishes to strike a balance between prescription of techniques, which may undermine the Use test, and complete flexibility, which may lead to scope for cherry-picking. However, undertakings shall remain aware of

a. the need to comply with the appropriateness test;

b. the need to comply with the tests and standards, as adapted for the integration technique; and

c. that the supervisory authority will review the selected technique to be assured that it is indeed one of the Level 3 technique.

3.164. When an undertaking chooses a technique from the Level 3 list, the technique shall be followed as set out in the Level 3 description. Undertakings shall regard the academic and actuarial literature as helpful references and assess how the technique will be applied by them.

3.165. This Option gives CEIOPS the responsibility of managing a list of techniques capable of producing a result that is consistent with the principles set out in Subsection 1 of Section 4 of the Level 1 Text.

Criteria and process for adding techniques to the list

3.166. CEIOPS recognises that it will be important to keep the Level 3 list of techniques up to date, taking into account information gained by supervisory authorities about new techniques, or refinements to techniques, as part of their assessment of internal models and as part of the supervisory review process. CEIOPS will review the list annually and will make amendments in line with current best practice and research. This may include removing techniques from the list. If an undertaking uses a technique no longer on the list the supervisory authority sets a transition period in which the technique may still be used. In its decision the supervisory authority will give particular emphasis on the available resources, the potential consequences of a continued use on the reflection of the undertaking's risk profile and the proportionality principle.

3.167. However, CEIOPS recognises that the insurance industry will wish to develop new techniques of integrating, and many of these will be applicable to the integration of partial internal models and the standard formula. This is in line with the Foundation Principle of the Use test, and CEIOPS very much encourages innovation. CEIOPS can envisage a situation where an undertaking develops a new integration technique and wishes to have this included in the Level 3 list.

3.168. If the information required is provided by the undertaking, CEIOPS does not foresee major problems with including new techniques. CEIOPS may review any proposed technique against the following criteria:

a. Is the technique a completely new technique, or a derivation of techniques already listed? In the latter case, the Level 3 list could be amended rather than added to;

b. How extensively the technique is used;

c. The effectiveness of the technique in producing an appropriately calibrated, risk reflecting result;

d. Whether the technique could be widely used;

e. The data requirements and need for expert judgement;

f. The quality of the academic and actuarial references.

3.169. The aim of the Level 3 guidance on each technique is to give undertakings enough information to choose an appropriate technique for integration and then apply it in a way that reflects their own risk profile and also is proportionate to the nature, scale and complexity of their risks

3.170. For each integration technique, CEIOPS will set out in the Level 3 guidance the following, this may not be an exhaustive list:

a. The name of the technique

b. A brief outline describing the technique including

i. The main data requirements (we may need to expand this and link to Article 121)

ii. The areas needing expert judgement (link to Article 121)

iii. The calculation method

c. References to any academic / actuarial literature that describes the technique, with pointers to the relevant sections of the literature.

d. The advantages of the technique

e. The disadvantages of the technique

f. The circumstances when the technique is inappropriate

3.171. It shall be noted that CEIOPS' responsibility for maintaining this list does not diminish the responsibility of undertakings to assess the appropriateness of the particular technique chosen and to justify this in the application to use an internal model. The ongoing appropriateness will also form part of the validation standards required for the internal model. The techniques listed at Level 3 will be mathematical methods, each with pros and cons, and drawbacks.

3.172. CEIOPS provides Advice on the adaptations of the tests and standards for internal models in respect of the integration technique between the partial internal model and the standard formula in Section 3.7.

Step 3

3.173. If none of the techniques provided in the Level 3 guidance is feasible or if the undertaking is unable to select an appropriate technique from the list after following the process described above, undertakings may use, subject to supervisory approval, other integration techniques, as long as their design is consistent with the referred Subsection 1 of Section 4 of Chapter VI of the Level 1 Text so to allow the partial internal model to be fully integrated in the SCR standard formula. The integration techniques shall also have to comply with the standards set out in Articles 120 to 126, particularly with the use test, so as to adequately and appropriately reflect the risk profile of undertakings.

3.174. Supervisory authorities always retain the power to

a. disagree with undertaking's integration technique and reject the model;

b. to approve it with terms and conditions;

c. require the undertaking to submit a transitional plan to extend the scope of the model to the level where it can be integrated in a straightforward manner with the standard formula or so that another integration technique might be used.

This is in order to ensure that the design of the partial internal model is not chosen on purpose in order to make all the techniques provided in the Level 3 guidance inapplicable.

Step 4

3.175. If the undertaking fails to demonstrate that the proposed integration techniques comply with all the provisions set on the paragraph 3.171, or if the undertaking is simply unable to formulate its own integration

technique, then the supervisory authorities shall decide how the partial internal model is integrated.

3.176. In doing so, the integration technique prescribed by supervisory authorities shall have to be consistent with Subsection 1 of Section 4 of Chapter VI of the Level 1 Text to allow the partial internal model to be fully integrated in the SCR standard formula and shall have to comply with the standards set out in Articles 120 to 125 and adequately and appropriately reflect the risk profile of the undertaking.

3.6 Examples of techniques to integrate partial internal models

3.177. The appropriateness of the integration technique shall be regularly assessed. If undertakings are required to analyse the appropriateness too often, this may cause a large resource restraint on the undertakings. On the other hand, if appropriateness is not shown often enough, the technique may not be adequately reflecting their risk profile and the undertaking may not be providing the appropriate amount of policyholder protection in the SCR. In order to strike a balance, undertakings shall demonstrate the appropriateness at least annually, but also when there are significant events or changes to the risk profile of the undertaking. This demonstration is considered to be part of the validation process as set in Article 124 of the Level 1 Text.

3.178. These examples presented in this Section are not binding. Their sole propose is to exemplify different types of aggregation techniques, some of which may be included at Level 3 Advice but not necessarily as presented hereunder.

3.179. There are several general approaches to integrate partial internals models into the standard formula, this not an exhaustive list:

- Two world scenario (to sum up the internal model's results with standard formula's results);
- Consistent standard formula replication (implicit correlations);
- Indirect application of the Standard formula integration technique;
- Other techniques;
- Mixtures of other techniques.

Two world scenario

3.180. Within this approach the results internally modelled are added-up to the standard formula results' assuming no diversification benefits betweens both.

3.181. Advantages:

- Simple and straightforward technique;
- No modelling cost to supervisory authorities or undertakings;
- Prudent in most cases;
- May encourage the development of full internal models;
- Applicable to all cases of partial internal models.

3.182. Disadvantages:

- Not risk sensitive;
- Most likely will not reflect the risk profile of undertakings;
- May discourage the development of partial internal models since it does not allow for diversification benefits between the internal model results' and may conflict with proportionality principle if the undertaking is not modelling the most significant part of the risks and lines of business;
- May not always be the most prudent result, especially with non elliptical distributions where the sub additivity property does not hold or when compounding effects between the partial internal model result's and the standard formula result's are overlooked;

3.183. Conditions under which may be appropriate:

- The diversification benefits are immaterial;
- The resulting part of the SCR calculated using the standard formula is immaterial;
- It will be disproportionate to develop other techniques;
- Not enough knowledge/information to apply any other technique

Consistent standard formula replication (implicit correlations)

3.184. Within this technique whenever the standard formula cannot be directly applied, the standard formula will be replicated in a way that ensures the final results will be the same and internal models can be integrated.

3.185. To do so as much assumptions as possible (explicit and implicit) from the standard formula will be extracted. Having replicated the standard formula results and structure in a way that allows for the integration of partial internal models results', the parts internally modelled are integrated using the dependency structure obtained.

3.186. This whole process can be achieved using different approaches (see Groupe Consultatif contribution), which may or may not use entity specific information:

- Using only assumptions from the standard formula (explicit and implicit):
  - Apply the standard formula aggregation approach (correlation matrix multiplication) and derive from the standard formula any correlations not embedded in the partial internal model and not directly given by the standard formula;
  - Apply a Gaussian copula (calibrated using the standard formula correlations) and Normal marginal distributions for each of the risks not covered by the partial internal model (calibrated with a mean of 0 and a standard deviation equal to the capital required under the standard formula (or the stress test) for the risk divided by 2.58) to integrate the standard formula assumptions into the multivariate partial internal model.
- Using undertakings' specific information

- Apply a Gaussian copula calibrated as in previous approach and marginal distributions calibrated in such a way that ensures that the 99,5% would be the same as in the standard formula for each risk and so the global SCR. The marginal distributions would be entity specific.

3.187. For the first approach a unique solution will only exist where a single correlation needs to be determined. One approach that can be used where multiple correlations need to be derived is to use the weighted average of the standard formula correlations and then to scale these correlations to ensure that the standard formula (SF) result is reproduced (it could just be a 2 step approach, first to aggregate correlations for risks modelled using the internal model and the standard formula and then derive the implicit correlation between both). If the partial internal model exactly replaces a SF SCR module or sub-module then it is straightforward to integrate the PIM with SF SCR using the existing SF correlations and correlation matrix approach.

3.188. The stability of the derived correlations depends on:

- how much you change the relative size of the capital requirements for each risk (i.e. how much the risk profile changes) and
- how different the relevant SF correlations are between risks (e.g. if the two risks modelled have identical correlations with other factors in the SF then the derived correlations are relatively stable for changes in risk profile, if one has correlations of -75% and one has correlations of +50% with all other risks then the derived correlations will be much more sensitive to the risk profile).
- however, this is a fair reflection of the risk rather than an indication of an unstable approach.

3.189. Advantages:

- Consistent with the standard formula by nature;
- Allows a step by step approach for undertakings on their way to a full internal model;
- More risk based than the two worlds scenario approach;
- More reflective of risk profile of undertakings than the two worlds scenario approach;
- Allows for the diversification benefits (implicit) in the standard formula to be considered and therefore more fair to undertakings than the two worlds scenario approach;
- Allows undertakings to incrementally assess the impact and importance of different enhancements (i.e. calibrations) and in turn determine the internal/partial model that best meets their needs;
- This approach also allows supervisory authorities to assess appropriateness of partial models including instances where the standard approach is used but should be enhanced, i.e. addresses cherry picking;

3.190. Disadvantages:

- The derived correlations may not always be stable, but instability may be due to changes in the risk profile of undertakings;
- The (full) calculation or replication of the standard formula will have to be made every year;
- The integration of internal model's result into standard formula will reflect the risk profile of undertakings to the extend the standard formula reflects it;
- Without additional constraints the approach might yield correlations lower than -1 or higher than 1. In addition, the correlation matrix might not be semi positive definite. This might make it difficult to interpret the results.
- May not be applicable to all cases, e.g. risks not covered in the standard formula.

3.191. Conditions under which may be appropriate:

- The standard formula implicit correlations adequately capture the risk profile of the undertaking;
- The diversification benefits are immaterial;
- The resulting part of the SCR calculated using the standard formula is immaterial;
- It will be disproportionate to develop other techniques;
- Not enough knowledge/information to apply other techniques.

Standard formula integration technique (indirect application)

3.192. In the cases where the standard formula cannot be applied directly, it may be still possible to apply the standard formula after intermediate steps are performed. These steps will depend on the structure of the partial internal model when compared to the standard formula and may include:

- Allocation of the internal model results to modules/sub-modules of the standard formula. This can be done using the internal models results if possible or assuming linear/weighted allocations according to the standard formula correlation matrix or simply allocating the model results to most representatives modules/risks modules of the standard formula;
- Re-categorisation of the internal model results to the same risk categorization of the standard formula (whenever the internal model results uses a different risk categorization form the standard formula) and then allocation of the internal model results to modules/sub-modules of the standard formula as described before.

3.193. Advantages:

- Consistent with the standard formula by nature;
- More risk based than the two worlds scenario approach;
- More reflective of risk profile of undertakings than the two worlds scenario approach;

- Allows for the diversification benefits (implicit) in the standard formula to be considered and therefore more fair to undertakings than the two worlds scenario approach;
- Less burdensome on supervisory authorities to analyse than other approaches.

3.194. Disadvantages:

- The mathematical soundness will vary considerably depending on how the allocation of risk categorization is done;
- The (full) calculation of the standard formula will have to be made every year;
- The aggregation of internal model's result into standard formula will reflect the risk profile of undertakings to the extent the standard formula reflects it;
- May be costly to undertakings;
- May not be always applicable to all cases, e.g. risks not covered in the standard formula.

3.195. Situations under which may be appropriate:

- The standard formula adequately reflect the risk profile of the undertaking;
- The allocation/re-categorisation is feasible;
- It will be disproportionate to develop other techniques;
- Not enough knowledge/information to apply other techniques.

Other techniques

3.196. This encompasses any techniques other than the two worlds scenario, consistent standard formula and indirect application of the standard formula approaches.

3.197. Some other examples of application of this approach

- Historical data analysis and/or expert judgment is used to set the correlation assumptions;
  - E.g. equity concentration risk is modelled as part of equity risk (by fitting a distribution to the historical performance of the undertaking's equity portfolio). The correlation between spread risk, real estate risk and FX risk can be re-derived by calculating the historical correlation between this equity return series and iBoxx credit spread indices, real estate indices and FX indices;
  - E.g. reinsurance counterparty default and life catastrophe risk have been modelled simultaneously in the model. The majority of the capital required stems from default risk (in this example) and so the partial internal model is integrated as if it was the counterparty default risk module. The insurer provides a written rationale for the assumed correlations with market risk, life u/w risk etc. based on historical data for mortality (including pandemics), defaults and the standard formula correlations.

- The undertaking may also choose to use simulation based approaches to integrate the capital required or combined risk scenarios for instance to use copulas or simulations approaches to model risks that behave in a non-semitrical way (to address one of the weaknesses of the correlation matrix integration technique – risks interact in a non-additive way).

3.198. Advantages:

- In principle is applicable to all situations;
- Flexible;
- In principle it may be more reflective of the risk profile of undertakings;
- Incentives the development of partial internal models and better risk management;
- May reduce systemic risk if modelling errors are not biased.

3.199. Disadvantages:

- May be burdensome on supervisory authorities;
- May be costly to undertakings
- The compliance with the statistical quality standards in some situations may be difficult to justify.

3.200. Conditions under which may be appropriate:

- When the standard formula is not possible or appropriate and
- Undertakings propose alternative appropriate techniques.

Mixture of the other techniques

3.201. This approach combines two or more of former techniques, e.g. to unbundle the partial internal model results into (ie allocate capital to) the modules or sub-modules of the standard formula (indirect use of the standard formula correlation matrix) for some risks and use standard formula implied correlations for other risks.

3.202. Advantages:

- Captures the advantages of the former approaches;
- Useful in situations where a single technique may not be always adequate;
- incentivises the development of partial internal models and better risk management.

3.203. Disadvantages:

- The overall approach may lack consistency;
- In some circumstances may lead to cherry picking situations.

3.204. Conditions under which may be appropriate:

- When a single of the former techniques is not always the most adequate.

Impact assessment policy Options vs approaches

	Possible approaches				
IA	**2 worlds scenario**	**Consistent standard formula replication**	**Indirect application of the standard formula aggregation mechanism**	**Other methods**	**Mixture of methods**
Option 1	X	X	X	X	X
Option 2	X	X	X	X	X
Option 3	X	X	X	X	X

3.205. All policy Options allow the referred techniques to integrate partial internal models. For example under Option 3 an undertaking may decide to integrate its partial internal model's results into the standard formula using a specific integration technique or simply summing up the results or using implicit correlations or indirectly applying the standard formula or using a combination of these techniques. If however, the chosen technique is not considered to be appropriate by the supervisory authority, then the supervisory authority may decide that the integration shall be made using another technique.

3.7 Adaptations to be made to standards as set out in Articles 120 to 126

3.206. The general provisions for internal models set out in CEIOPS Advices on the Procedure to be followed for the approval of an internal model, Test and Standards for internal models approval, Capital add-on and Supervisory reporting and disclosure, apply to partial internal models. This Section refers to the adaptations to be made to those standards as required by Article 114(2).

Article 120

3.207. The Principles regarding the use test described in CEIOPS Advice on Tests and Standards for internal models approval, apply equally to full and partial internal models. However, there are adjustments required for partial internal models described below. Any further adjustments required for the application of the use test to an integration technique between a partial internal model and the standard formula, where the integration technique is developed by the undertaking, are also described.

3.208. The use test does not apply to integration techniques prescribed by the supervisory authority (Step 4 of the process). However, the use test, as adapted for integration techniques between the partial internal model and the standard formula, does apply to integration techniques selected from the Level 3 list of integration techniques (Step 2 of the process).

CEIOPS considers that the use test as adapted for integration techniques shall be applied in a manner proportionate to the integration technique selected from the Level 3 list, reflecting the degree of modelling freedom in the integration technique.

3.209. Notwithstanding with the referred adaptation, CEIOPS expects that the undertaking has to take also the results of the integration technique that is prescribed by the supervisory authority into account during their decision making process. CEIOPS expects that the decision makers should be aware of the different impact of the results of an integration technique prescribed by the supervisory authority and the one the undertaking may use for its steering purposes. CEIOPS expect that it is documented how these different results are taken into account during the decision making process and that the reasons are documented why the undertaking uses a different integration technique.

"Foundation Principle: the undertaking's use of the internal model shall be sufficiently material to result in pressure to improve the quality of the internal model".

3.210. The foundation Principle is not a requirement to extend the scope of a partial internal model, but to improve the internal model within the scope approved.

"Principle 1: senior management and the administrative, management or supervisory body, shall be able to demonstrate understanding of the internal model"

3.211. The senior management and the administrative, management or supervisory body shall demonstrate that they understand the internal model, including the logic behind the internal model, including for partial internal models the way the model is integrated into the standard formula.

"Principle 2: the internal model shall fit the business model"

3.212. The design of the internal model shall be in alignment with the undertaking's business model. The design of the internal model shall align with the business model in at least the several aspects, with regards to the capital-allocation approach and the granularity of allocation, it shall reflect the undertaking's risk-management system and its business model, and include information on the consumption of regulatory capital. The granularity shall especially correspond to the level of decision-making processes within the undertaking. For partial internal models, the degree to which this requirement is feasible will depend on the scope and structure of the model, while some scopes may allow this requirement to be partially fulfilled to a greater or lesser extent, other (e.g. very limited scopes) may deem the requirement hard to apply. The application of Principle 2 is closely linked to Sections 3.2 and 3.3 of this Advice.

"Principle 3: The internal model shall be used to support and verify decision-making in the undertaking"

3.213. When considering Principle 3, decision-makers in particular, for partial internal models they need to be aware of what the internal model covers and how this links to their decisions.

3.214. However, CEIOPS considers that Principle 3 does not apply to an integration technique between the partial internal model and the standard formula that is developed by an undertaking.

"Principle 4: The internal model shall cover sufficient risks to make it useful for risk management and decision-making"

3.215. For partial internal models, undertakings need to use this Principle as part of justifying the limited scope of the partial internal model as required by Article 113(1)(a) of the Level 1 Text. This links to the discussion in CEIOPS Advice on the procedure to be followed for the approval of an internal model[10], paragraphs 3.122 to 3.124, where CEIOPS set out examples of reasons to justify the limited scope of the internal model. However, CEIOPS considers that Principle 4 does not apply to an integration technique between the partial internal model and the standard formula that is developed by an undertaking.

"Principle 5: undertakings should design the internal model in such a way that it facilitates analysis of business decisions"

3.216. CEIOPS considers that Principle 5 does not apply to an integration technique between the partial internal model and the standard formula that is developed by an undertaking. CEIOPS regards it as a good practise that the results will be used to inform internal debate. CEIOPS expects that the results are, for example, at least discussed with the persons responsible for risk in the administrative, management or supervisory body.

"Principle 6: The internal model shall be widely integrated with the risk-management system"

3.217. Article 120 of the Level 1 Text makes the importance of the internal model in the undertaking's risk-management system clear. In CEIOPS' view, undertakings will be able to demonstrate that the internal model is used in the risk-management system by showing, for example, that the risk quantification and risk rankings produced by the internal model trigger action in the undertaking; that all material risks identified by the risk-management system should be an input into and therefore assessed by the internal model (notwithstanding the limited scope of partial internal models). Therefore no adaptations to this principle are required.

"Principle 7: the internal model shall be used to improve the undertaking's risk-management system"

3.218. CEIOPS considers that Principle 7 does not apply to an integration technique between the partial internal model and the standard formula that is developed by an undertaking.

Internal model governance

3.219. The administrative, management or supervisory body needs to have a well thought through rationale for applying to use a partial internal model. As part of the design of the internal model, the administrative, management or supervisory body shall ensure that this includes a process to review the risk profile of the undertaking to make sure the

[10] Level 2 Advice: The procedure to be followed for the approval of an internal model

design of the partial internal model reflects this more appropriately than the standard formula.

3.220. In CEIOPS' view, this is a key responsibility, and includes the whole process from the undertaking starting to consider whether to apply for internal model approval, deciding on the scope of the internal model, developing the application and going through an appropriate pre-application process, as well as the actual submission of the application to the supervisory authority.

3.221. For partial internal models decisions on the scope are particularly important and the administrative, management or supervisory body is responsible for defining an appropriate scope for the model and also making sure that this is properly documented and well understood by the undertaking. In the case of partial internal models the use test plays an important role in the justification of the limited scope of the model.

3.222. Where the undertaking uses an integration technique not prescribed by the supervisory authority it shall have to demonstrate that the integration technique adequately reflects its risk profile.

3.223. The Level 1 Text requires the risk management function to, among other tasks, analyse and report on the performance of the model. For partial internal model, this analysis and reporting shall include an assessment of the compliance with the specific partial internal model requirements.

Article 121

3.224. No specific adaptations are to be made on the statistical quality standards for the application to partial internal models. The corresponding requirements set out in CEIOPS Advice on Tests and Standards for internal models approval shall apply to the limited scope of the partial internal model.

3.225. Beyond that, the Statistical Quality Standards shall apply to the undertaking's own integration technique used to integrate the partial internal model's results into the standard formula's results. In particular, the integration technique shall be subject to the requirements set out in Section 5.3.5 "Recognition of Diversification effects" of CEIOPS Advice on Tests and Standards for internal model approval.

3.226. A major implication of the Use test is that undertakings must have one and only one modelling framework. The undertaking will set out the scope of the modelling framework that it plans to use to calculate the SCR when it applies for approval to do so. This may include many different tools, used at different levels of the undertaking.

3.227. In general, also for partial internal models, a probability distribution forecast should be generated at the topmost level within the scope of the partial internal model.

3.228. For partial internal models the modelling framework may result in some risks and/or major business units being modelled separately (model components). In such cases a probability distribution forecast shall be generated at the topmost level of each model component.

Article 122

3.229. No adaptations are to be made to the standards to take into account the limited scope of the partial internal model are needed.

3.230. For the integration with standard formula the undertaking will first have to calibrate the internal model results to the time period and risk measure set out in Article 101(3) of the Level 1 Text.

Article 123

3.231. No specific adaptations are required for the application of the profit and loss attribution to partial internal models. The profit and loss attribution as described in CEIOPS Advice on Tests and Standards for internal models approval shall be applied to the limited scope of the partial internal model.

3.232. The definition of major business unit, as described in Article 123 shall be consistent with the clarification of major business unit as set out in Section 3.2 of this paper.

Article 124

3.233. For partial internal models the validation policy shall include, in addition to the minimum requirements set out in CEIOPS Advice on Tests and Standards for internal models approval,

a. The validation of the limited scope of the model, and

b. The adequacy of the integration technique used to integrate the partial internal model's results into the standard formula's results.

For point b above, the integration technique will not be required to be included in the validation policy if the supervisory authority has prescribed the integration technique, including if it is the standard formula correlation matrix. The technique will however have to be included in the validation policy if the undertaking chooses one of the techniques prescribed by CEIOPS in Level 3.

3.234. When testing the robustness of the partial internal model namely through sensitivity testing, the analysis should also include the integration technique used to integrate the partial internal model's results into the standard formula's results.

3.235. When performing stress tests the undertakings' analysis should also include the integration technique used to integrate the partial internal model's results into the standard formula's results.

Article 125

3.236. In the specific case of partial internal models, the documentation should cover the justification for the limited scope of the model and the integration technique used to integrate the partial internal model's results into the standard formula's results, and all the additional requirements set out in Article 113(1) of the Level 1 Text.

3.237. The documentation shall include evidence that all levels of management of the undertaking understand the relevant aspects of the internal model, including for partial internal models the way the model is integrated into the standard formula.

3.238. In the case of a transitional plan for extension of the scope of the model, an undertaking should document it, taking into account the provisions expressed in CEIOPS Advice on the Procedure to be followed for the approval of an internal model.

3.239. For partial internal models the circumstances under which the integration technique does not pass the feasibility test and/or appropriateness test should be documented.

Article 126

3.240. External models and data have to be suitable for representing the undertakings' own risk profile. Undertakings are responsible for making sure that external models and data used by the internal model are suitable and representative for modelling the risks the undertaking is exposed to.

3.241. This includes the integration technique used to integrate the partial internal model's results into the standard formula's results, if applicable.

3.242. Undertakings shall be able to explain the reasons for preferring external models or data to internal ones. They shall also be able to list the alternatives considered and explain the decision for a particular external model or data.

3.243. The dependency structure between the risk modules affected by the use of external models and data are part of the validation policy as set in Article 124 of the Level 1 Text.

CEIOPS' Advice

Adaptations to be made to Article 120

3.244. The Principles regarding the use test described in CEIOPS Advice on Tests and Standards for internal models approval apply equally to full and partial internal models. However, there are adjustments required for partial internal models described below. Any further adjustments required for the application of the use test to an integration technique between a partial internal model and the standard formula, where the integration technique is developed by the undertaking, are also described.

3.245. The use test does not apply to integration techniques prescribed by the supervisory authority (Step 4 of the process). However, the use test, as adapted for integration techniques between the partial internal model and the standard formula, does apply to integration techniques selected from the Level 3 list of integration techniques (Step 2 of the process). CEIOPS considers that the use test as adapted for integration techniques shall be applied in a manner proportionate to the integration technique selected from the Level 3 list, reflecting the degree of modelling freedom in the integration technique.

3.246. Notwithstanding with the referred adaptation, CEIOPS expects that the undertaking has to take also the results of the integration technique that is prescribed by the supervisory authority into account during their decision making process. CEIOPS expects that the decision makers shall

be aware of the different impact of the results of an integration technique prescribed by the supervisory authority and the one the undertaking may use for its steering purposes. CEIOPS expect that it is documented how these different results are taken into account during the decision making process and that the reasons are documented why the undertaking uses a different integration technique.

"*Foundation Principle: the undertaking's use of the internal model shall be sufficiently material to result in pressure to improve the quality of the internal model*".

3.247. The foundation Principle is not a requirement to extend the scope of a partial internal model, but to improve the internal model within the scope approved.

"*Principle 1: senior management and the administrative, management or supervisory body, shall be able to demonstrate understanding of the internal model*"

3.248. The senior management and the administrative, management or supervisory body shall demonstrate that they understand the internal model, including the logic behind the internal model, including for partial internal models the way the model is integrated into the standard formula.

"Pr*inciple 2: the internal model shall fit the business model*"

3.249. For partial internal models, the degree to which this requirement is feasible will depend on the scope and structure of the model, while some scopes may allow this requirement to be partially fulfilled to a greater or lesser extent, other (e.g. very limited scopes) may deem the requirement hard to apply.

"*Principle 3. The internal model shall be used to support and verify decision--making in the undertaking*"

3.250. When considering Principle 3, decision-makers in particular, for partial internal models they need to be aware of what the internal model covers and how this links to their decisions. However, CEIOPS considers that Principle 6 does not apply to an integration technique between the partial internal model and the standard formula that is developed by an undertaking.

"*Principle 4: The internal model shall cover sufficient risks to make it useful for risk management and decision-making*"

3.251. For partial internal models, undertakings need to use this Principle as part of justifying the limited scope of the partial internal model as required by Article 113(1)(a) of the Level 1 Text. However, CEIOPS considers that Principle 3 does not apply to an integration technique between the partial internal model and the standard formula that is developed by an undertaking.

"*Principle 5: undertakings shall design the internal model in such a way that it facilitates analysis of business decisions*"

3.252. Finally, CEIOPS considers that Principle 5 does not apply to an integration technique between the partial internal model and the

standard formula that is developed by an undertaking. CEIOPS regards it as a good practise that the results will be used to inform internal debate. CEIOPS expects that the results are, for example, at least discussed with the persons responsible for risk in the administrative, management or supervisory body.

"*Principle 7: the internal model shall be used to improve the undertaking's risk-management system*"

3.253. CEIOPS considers that Principle 7 does not apply to an integration technique between the partial internal model and the standard formula that is developed by an undertaking.

Adaptations to be made to internal model governance

3.254. The administrative, management or supervisory body needs to have a well thought through rationale for applying to use a partial internal model. As part of the design of the internal model, the administrative, management or supervisory body shall ensure that this includes a process to review the risk profile of the undertaking to make sure the design of the partial internal model reflects this more appropriately than the standard formula.

3.255. For partial internal models decisions on the scope are particularly important and the administrative, management or supervisory body is responsible for defining an appropriate scope for the model and also making sure that this is properly documented and well understood by the undertaking.

3.256. The Level 1 Text requires the risk management function to, among other tasks, analyse and report on the performance of the model. For partial internal model, this analysis and reporting shall include an assessment of the compliance with the specific partial internal model requirements.

Adaptations to be made to Article 121

3.257. No specific adaptions are to be made on the statistical quality standards for the application to partial internal models. The corresponding requirements set out in CEIOPS Advice on Tests and Standards for internal models approval shall apply to the limited scope of the partial internal model.

3.258. Beyond that, the Statistical Quality Standards shall apply to the undertaking's own integration technique used to integrate the partial internal model's results into the standard formula's results. In particular, the integration technique shall be subject to the requirements set out in Section 5.3.5 "Recognition of Diversification effects" of CEIOPS Advice on Tests and Standards for internal model approval.

3.259. In general for partial internal models, a probability distribution forecast shall be generated at the topmost level within the scope of the partial internal model.

3.260. For partial internal models the modelling framework may result in some risks and/or major business units being modelled separately (model component). In such cases a probability distribution forecasts shall be generated at the topmost level of each model component.

Adaptations to made to Article 122

3.261. No adaptations are to be made to the standards to take into account the limited scope of the partial internal model are needed. For the integration with standard formula undertakings will first have to calibrate the internal model results to the time period and risk measure set out in Article 101(3) of the Level 1 Text.

Adaptations to be made to Article 123

3.262. No specific adaptations are required for the application of the profit and loss attribution to partial internal models. The profit and loss attribution as described in CEIOPS Advice on Tests and Standards for internal models approval shall be applied to the limited scope of the partial internal model.

3.263. The definition of major business unit, as described in Article 123 shall be consistent with the clarification of major business unit as set out in Section 3.2 of this paper.

Adaptations to be made to Article 124

3.264. For partial internal models the validation policy shall include, in addition to the minimum requirements set out in CEIOPS Advice on Tests and Standards for internal models approval,

a. The validation of the limited scope of the model, and

b. The adequacy of the integration technique used to integrate the partial internal model's results into the standard formula's results.

For point b above, the integration technique will not be required to be included in the validation policy if the supervisory authority has prescribed the integration technique, including if it is the standard formula correlation matrix. The technique will however have to be included in the validation policy if the undertaking chooses one of the techniques prescribed by CEIOPS in Level 3.

3.265. When testing the robustness of the partial internal model namely through sensitivity testing, the analysis shall also include the integration technique used to integrate the partial internal model's results into the standard forumla's results.

3.266. When performing stress the undertakings' analysis shall also include the integration technique used to integrate the partial internal model's results into the standard formula's results.

Adaptations to be made to Article 125

3.267. In the specific case of partial internal models, the documentation shall cover the justification for the limited scope of the model and the integration technique used to integrate the partial internal model's results into the standard formula's results, and all the additional requirements set out in Article 111(1) of the Level 1 Text.

Adaptations to be made to Article 126

3.268. External models and data have to be suitable for representing the undertakings' own risk profile. This includes the integration technique used to integrate the partial internal model's results into the standard formula's results, if applicable.

3.269. The dependency structure between the risk modules affected by the use of external models and data are part of the validation policy as set in the Article 124 of the Level 1 Text.

3.8 Risks not covered in the standard formula

3.270. This Section refers to specific risks which may arise either at solo or group level and which are not explicitly considered by the Standard Formula, for instance underwriting cycles risk, commodity or contagion risk.

3.271. Where these risks are quantifiable, undertakings and groups shall take them into account in the calculation of the SCR. In the case of a full internal model, they can of course model them, whereas for partial internal models, it is unclear how this can be done and a legal problem may arise irrespectively of whether the undertaking uses the standard formula and intends to develop a partial internal model solely for these non covered risks or the undertaking uses the standard formula and an already approved partial internal model and intends to extend the scope of the model to cover these risks.

3.272. When dealing with partial internal models, undertakings and/or groups have several Options to consider these specific risks. For example, amongst other:

- Assume that these specific risks are linked to existing risks of the standard formula. This kind of approach may be particularly suitable for integrated stochastic models based on economic scenario generators;
- Establish a new risk module to take into account these risks;
- Assume that the risk is linked to a specific business unit and build a full model with respect to this business unit, which takes into account these specific risks.

3.273. Some concerns were raised regarding whether the second Option was consistent with Article 112 of the Level 1 Text, namely with respect to the explicit mention of modules from the Standard Formula. However, Article 104(1) of the Level 1 Text mentions that the Basic SCR "*shall at least cover the following modules…*", which hints the possibility of encompassing other modules. Regardless of the legal interpretation, from a technical (and management) point of view in some situations, it may be a more efficient way to model them as separate risk modules than splitting them between existing modules.

3.274. For many Member States, restricting the modelling freedom and limiting the introduction of risks not covered in the Standard Formula is deemed not to be consistent with the overall framework aiming at improving the risk management and promoting an adequate reflection of risk profiles.

3.275. The third Option may be problematic when the specific risk is not clearly linked to a business unit. Undertakings might then build artificial business units only to avoid the possible non-compliance of the second Option. For many Member States, this would be only a last resort solution, with no link to economic reality, even though admittedly for some business structures this third Option may actually be suitable (namely when they already have a partial internal model structured by business units).

3.276. The first Option would thus seem the best Option. However, CEIOPS needs to tackle a lot of different situations and it is impossible to foresee if all the risks considered are always easily transferable to existing modules. Therefore CEIOPS believes that all three Options should be allowed, as well other developed by undertakings, that comply with the standards set out in Articles 120 to 126, particularly with the use test, so as to adequately and appropriately reflect the risk profile of undertakings.

3.277. In this analysis, the ability for supervisors to use Pillar II add-ons was not considered, so to emphasize the fact that undertakings may be volunteering for including these risks (in a quantifiable manner), and capital add-ons are last resort measures.

CEIOPS' Advice

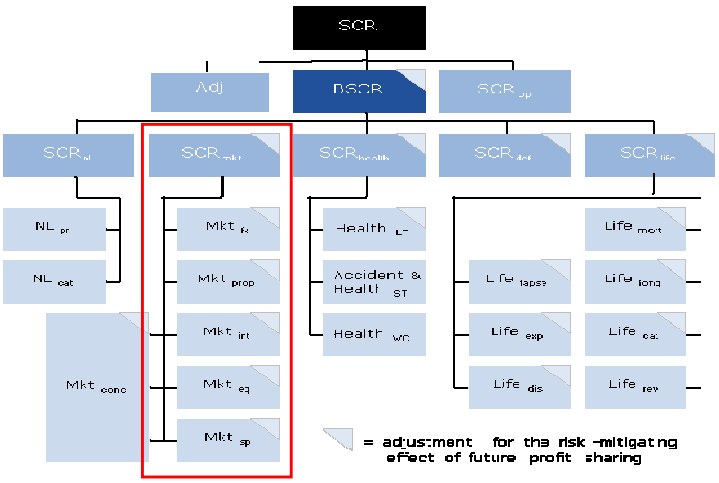
3.278. There are specific risks which may arise either at solo or group level and which are not explicitly considered by the Standard Formula. Where these risks are quantifiable, undertakings and groups shall take them into account in the calculation of the SCR. When dealing with partial internal models, undertakings and/or groups have several Options to consider these specific risks. For example amongst:

- Assume that these specific risks are linked to existing risks of the standard formula;
- Establish a new risk module to take into account these risks;
- Assume that the risk is linked to a specific business unit and build a full model with respect to this business unit, which takes into account these specific risks.

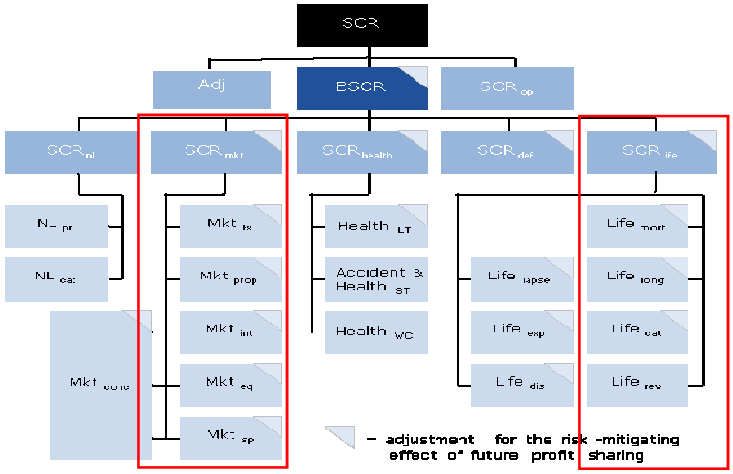
3.279. The first Option would seem the best Option. However, CEIOPS needs to tackle a lot of different situations and it is impossible to foresee if all the risks considered are always easily transferable to existing modules, therefore believes that all three Options shall be allowed, as well other developed by undertakings, that comply with the standards set out in Articles 120 to 126, particularly with the use test, so as to adequately and appropriately reflect the risk profile of undertakings.

Annex A: Examples of partial internal models

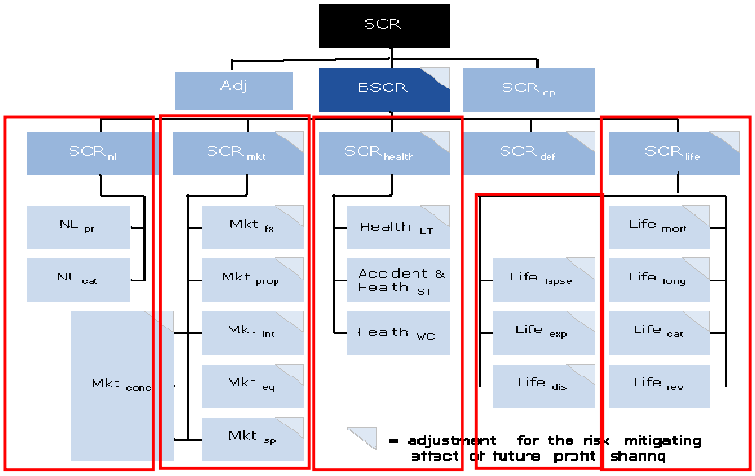
1a) Modeling one risk module



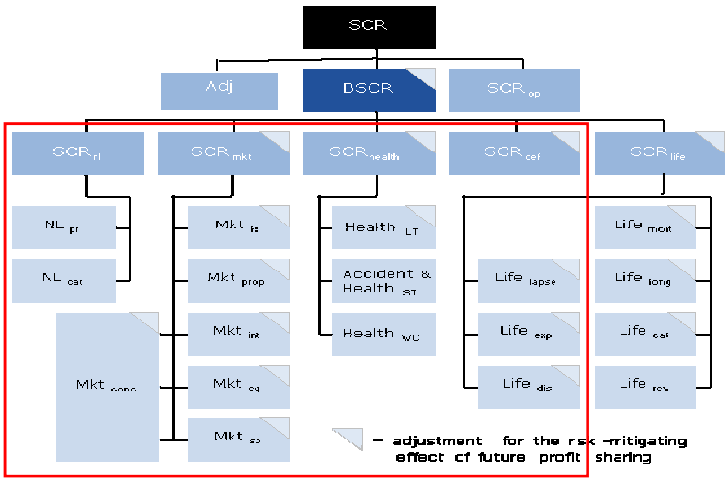
1b1) Modeling two (or more) risk modules separately



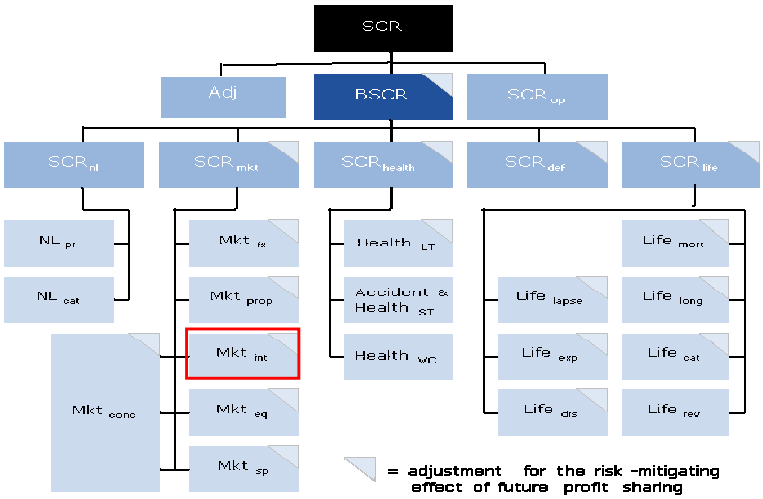
1b2) Modeling two (or more) risk modules separately



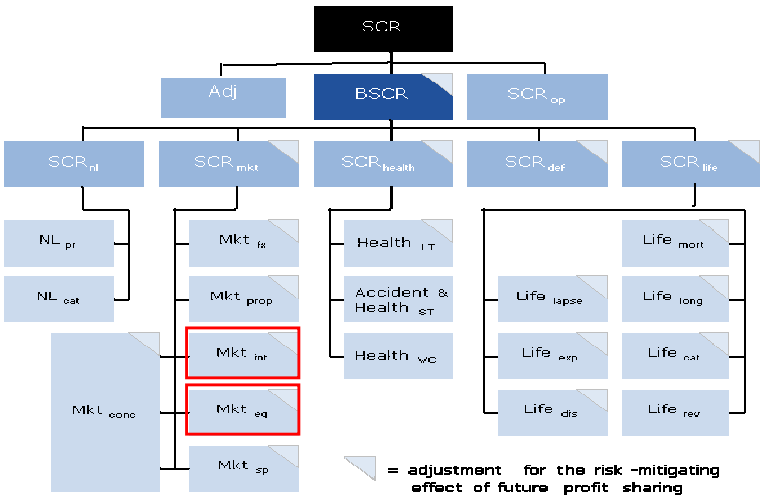
1c2) Modeling two (or more) risk modules jointly



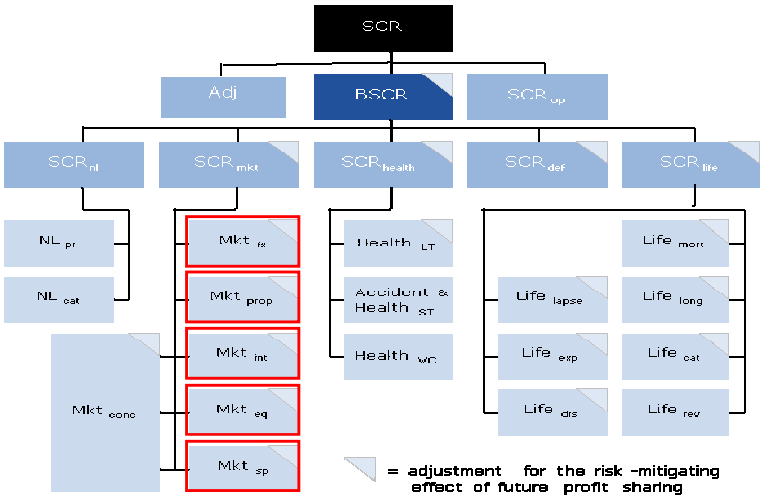
2a) Modeling one risk sub-module



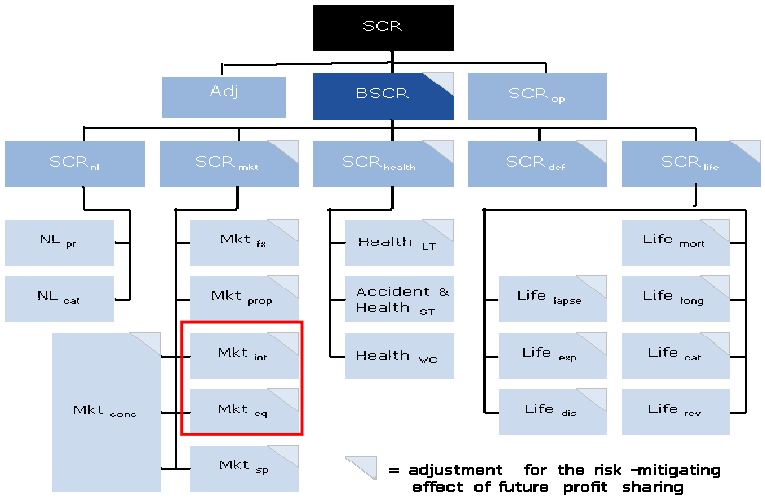
2b1) Modeling two (or more) risk sub-modules within the same risk module separately



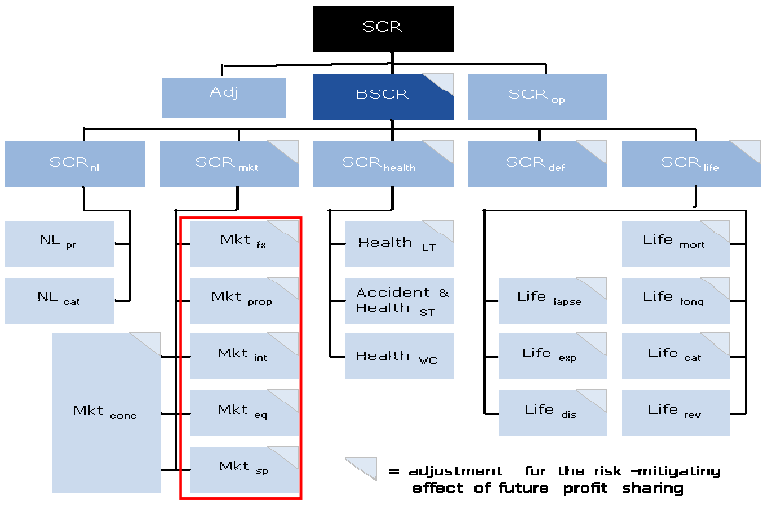
2b2) Modeling two (or more) risk sub-modules within the same risk module separately



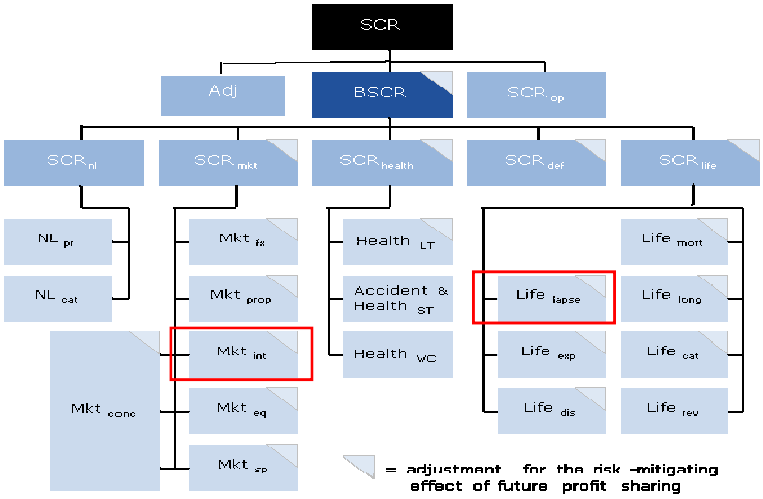
2c1) Modeling two (or more) risk sub-modules within the same risk module jointly



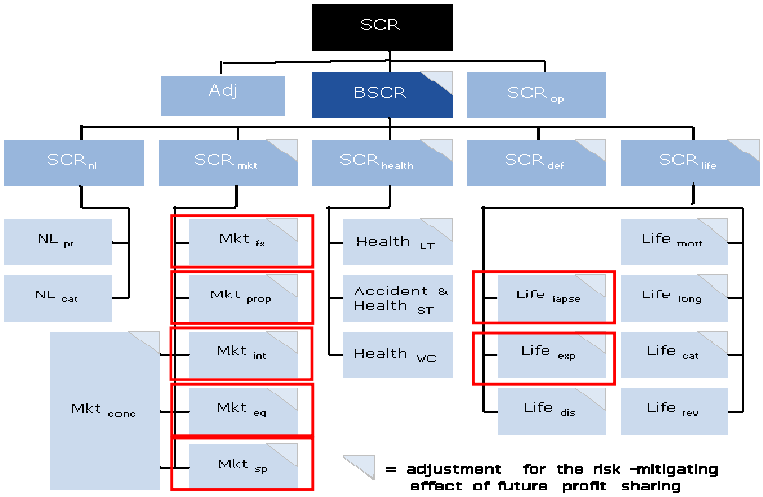
2c2) Modeling two (or more) risk sub-modules within the same risk module jointly



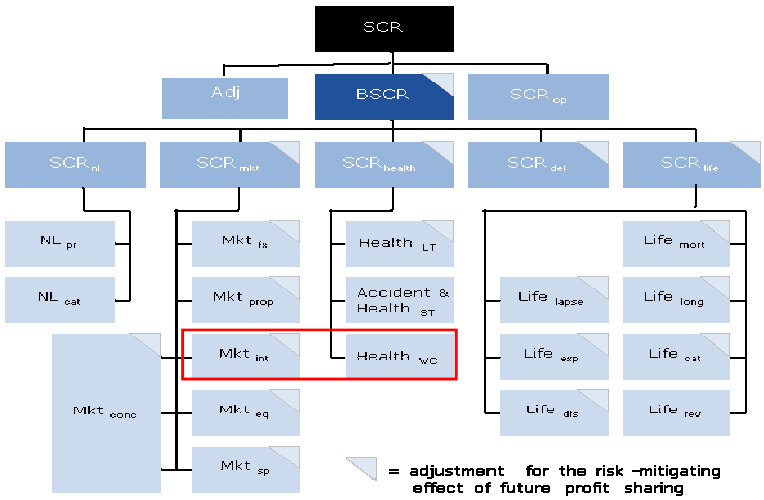
3a1) Modeling two (or more) risk sub-modules from different risk modules separately



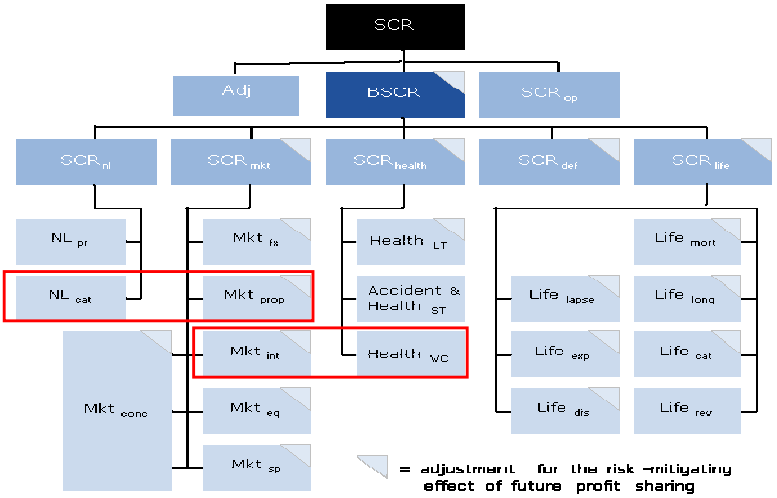
3a2) Modeling two (or more) risk sub modules from different risk modules separately



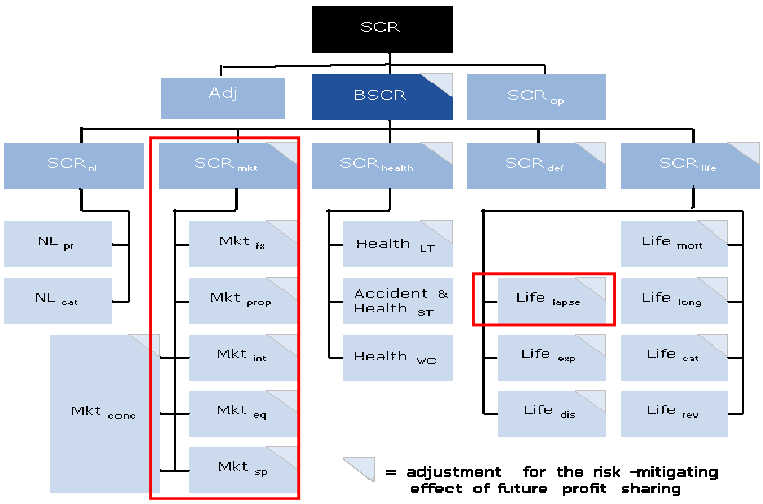
3b1) Modeling two (or more) risk sub-modules from different risk modules jointly



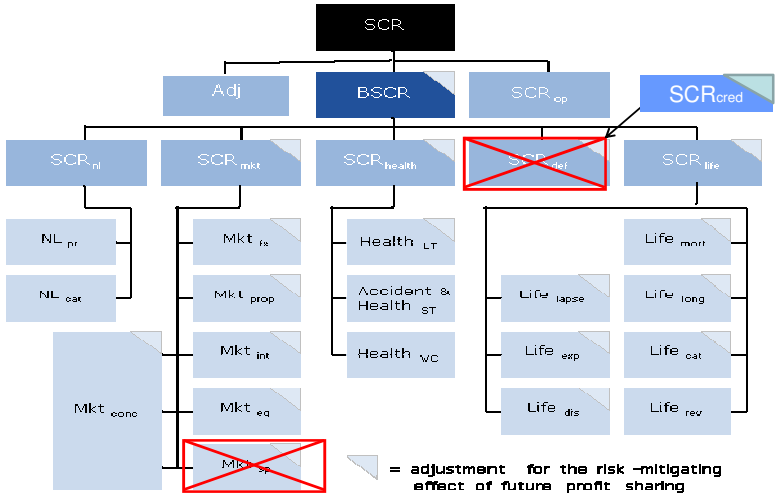
3b2) Modeling two (or more) risk sub-modules from different risk modules jointly



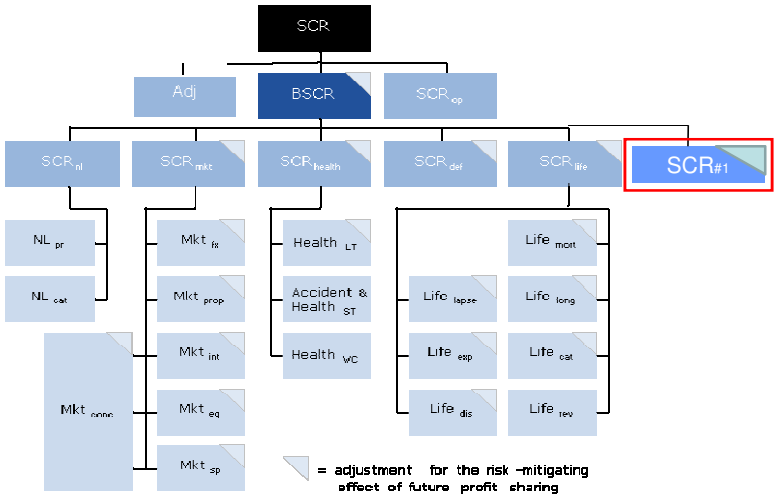
4) Modeling one (or more) risk module and one (or more) risk sub-module from a different module



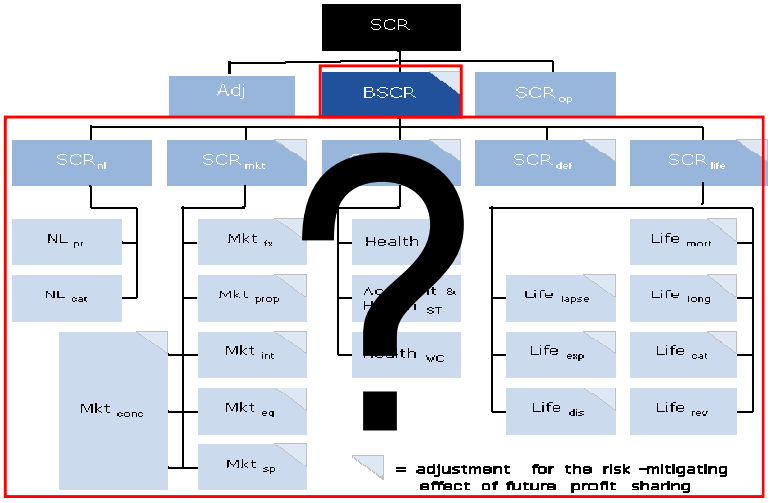
5) Different risk categorization either modules/sub-modules from the same/different risk module (e.g. credit risk = counterparty default + spread risk + migration risk)



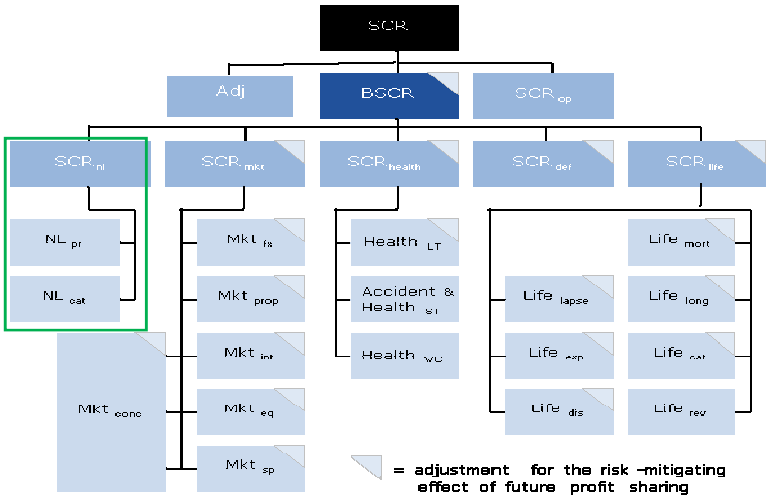
6) Risks not modeled in the standard formula (e.g. risk #1)



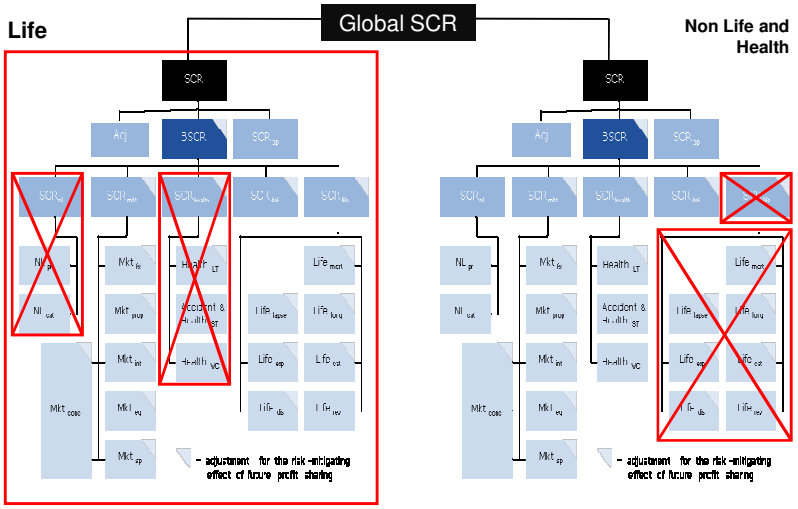
7) Non modular model (holistic model for the BSCR)



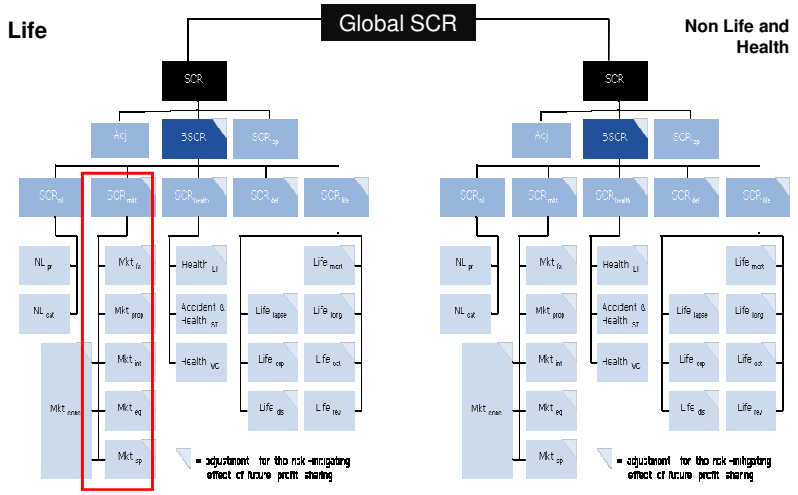
8) Different risk calibration either modules/submodules from the same/different risk module (NL underwriting TailVaR 99% ⇔ VaR 99,5%)



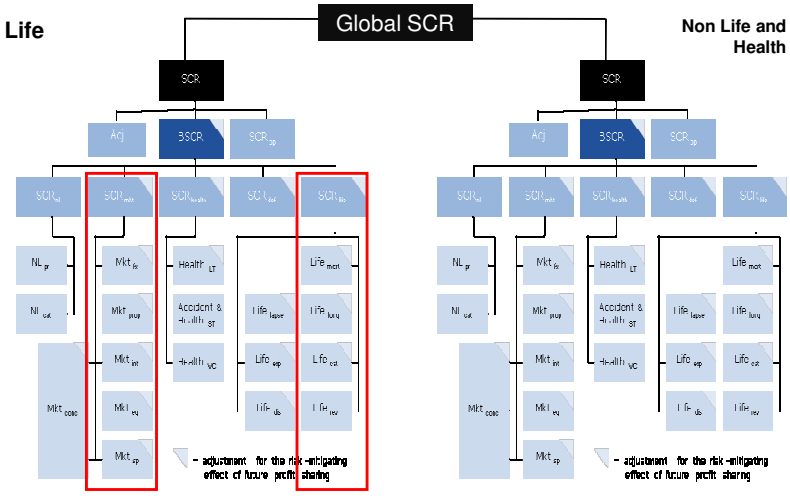
10) Modeling all risks for 1 or more lines of business (e.g. composite: all risks for the life business are internally modeled)



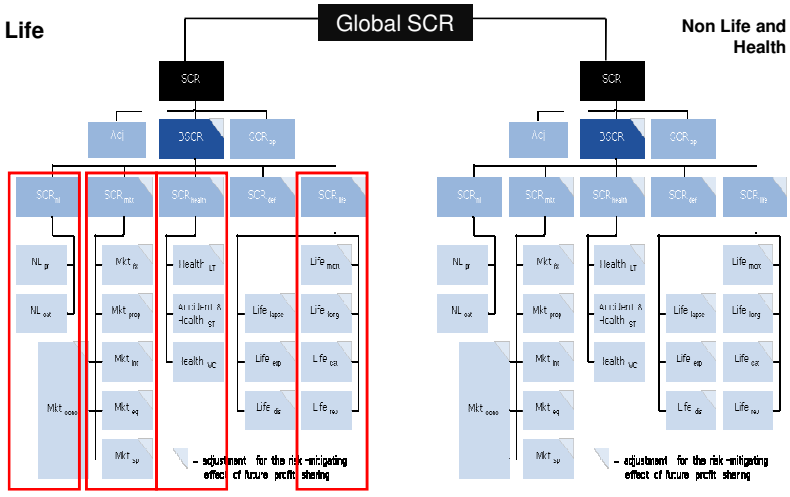
11 a) Modeling one risk module for 1 or more lines of business



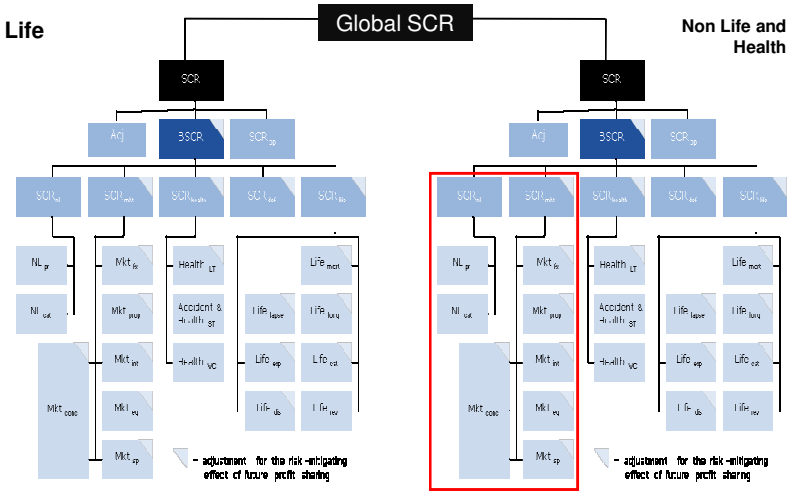
11 b1) Modeling two (or more) risk modules separately for 1 or more lines of business



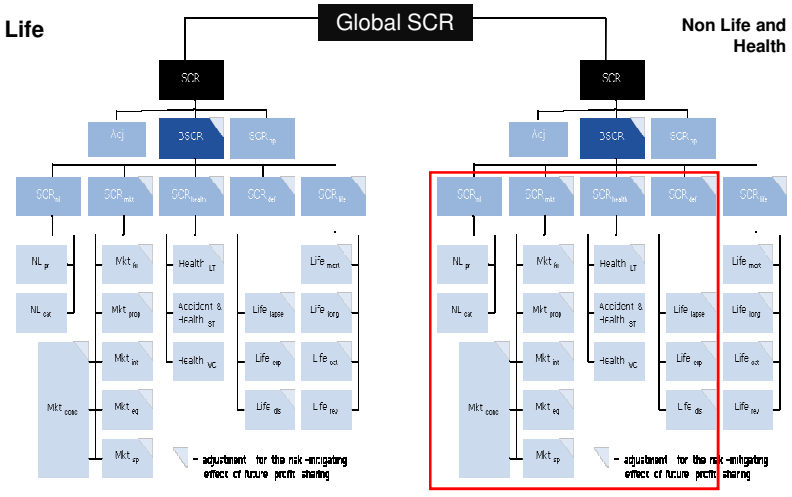
11 b2) Modeling two (or more) risk modules separately for 1 or more lines of business



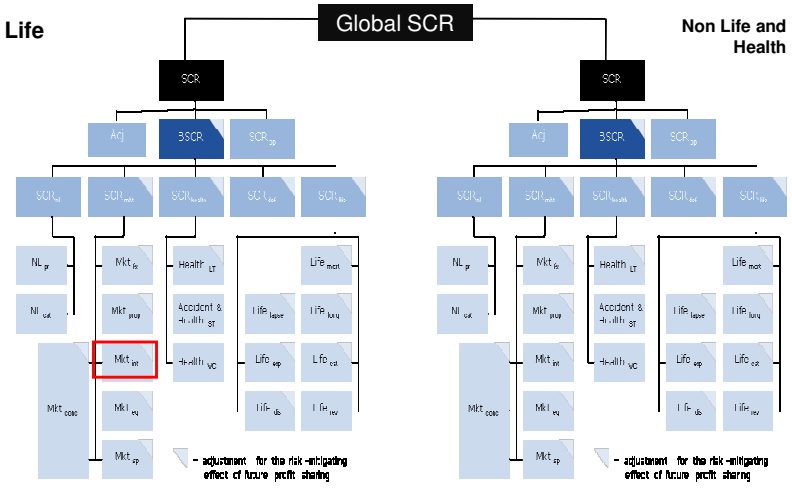
11 c1) Modeling two (or more) risk modules jointly for 1 or more lines of business



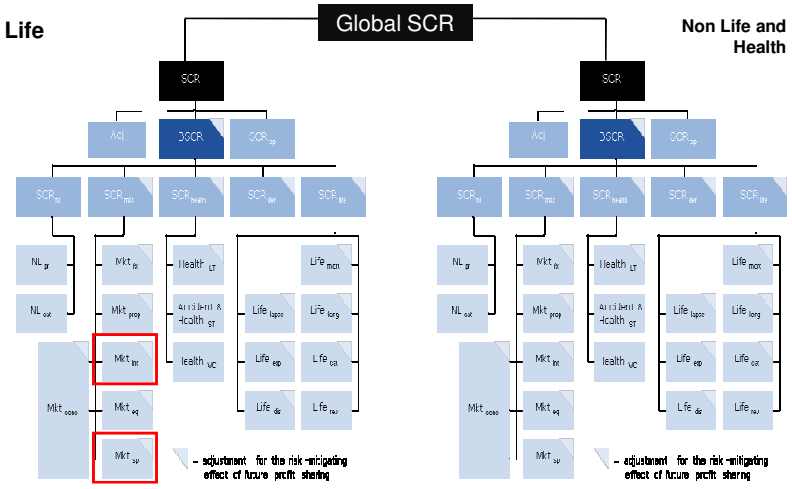
11 c2) Modeling two (or more) risk modules jointly for 1 or more lines of business



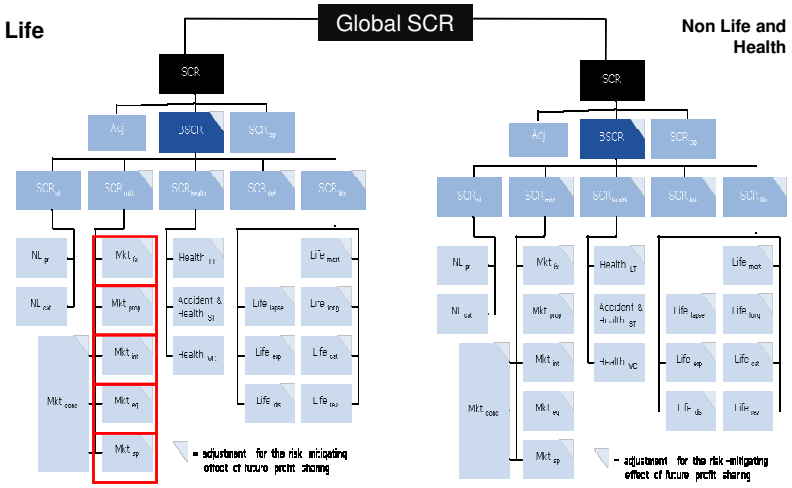
12 a) Modeling one risk sub-module for 1 or more lines of business



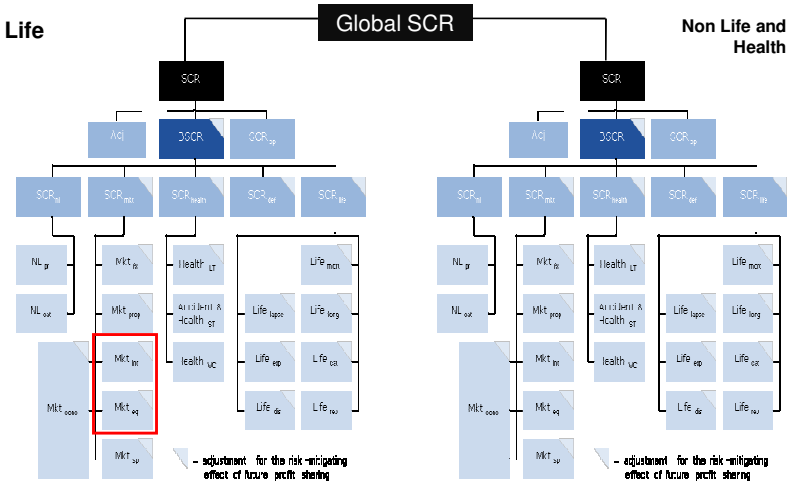
12 b1) Modeling two (or more) risk sub-modules within the same risk module separately for 1 or more lines of business



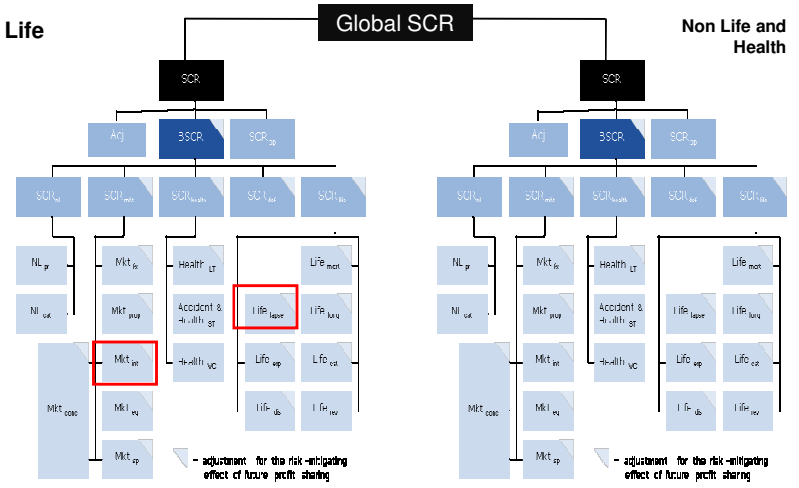
12 b1) Modeling two (or more) risk sub-modules within the same risk module separately for 1 or more lines of business



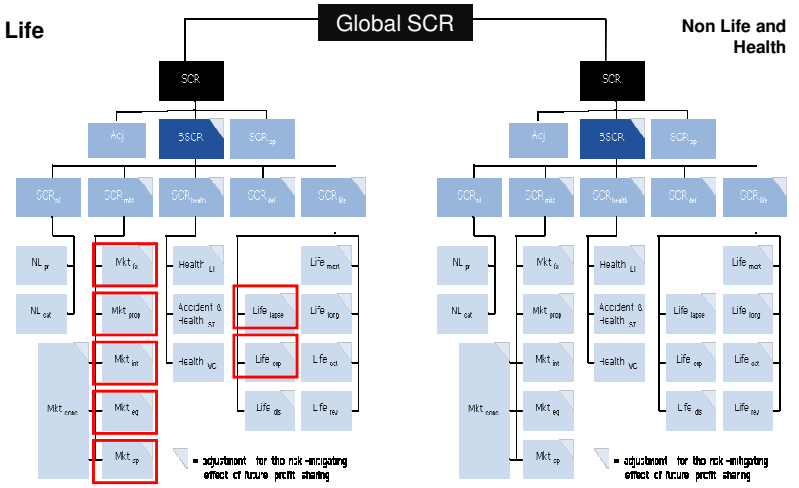
12 c) Modeling two (or more) risk sub-modules within the same risk module jointly for 1 or more lines of business



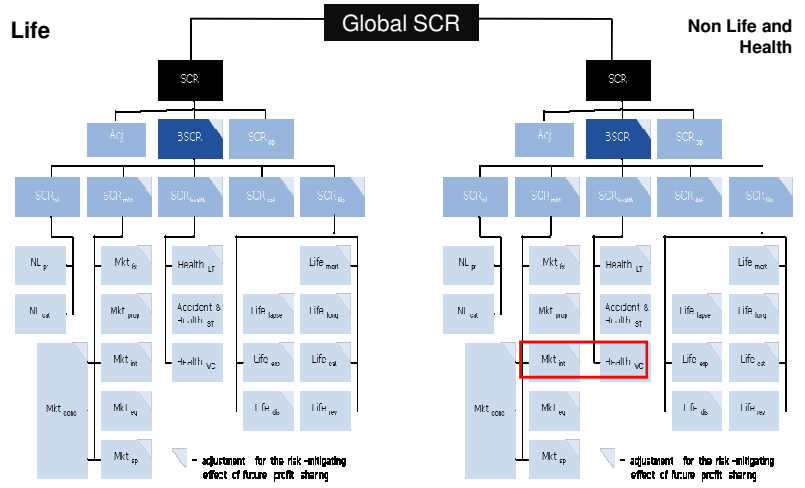
13 a1) Modeling two (or more) risk sub-modules from different risk modules separately for 1 or more lines of business



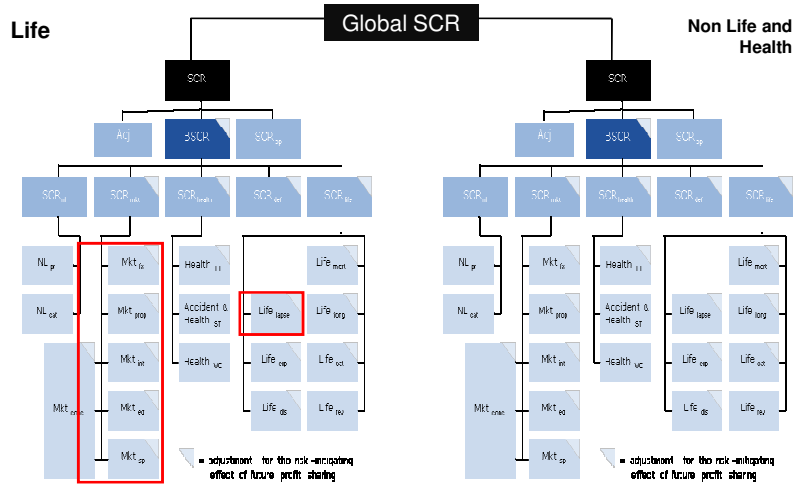
13 a2) Modeling two (or more) risk sub-modules from different risk modules separately for 1 or more lines of business



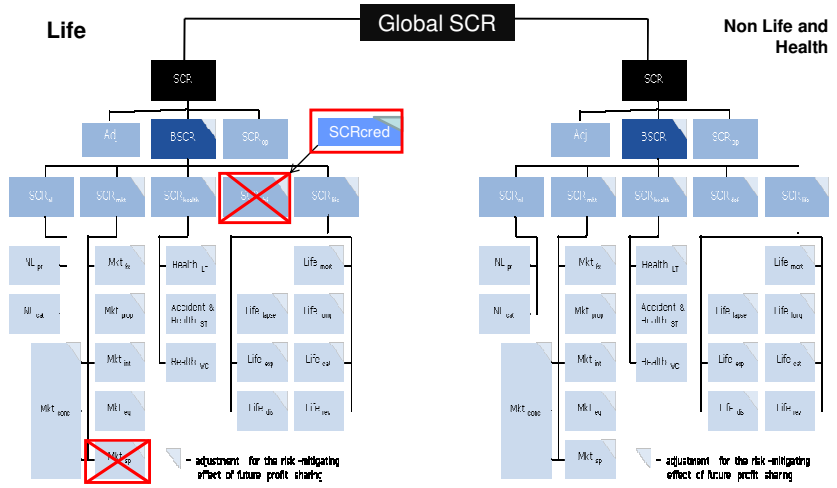
13 b) Modeling two (or more) risk sub-modules from different risk modules jointly for 1 or more lines of business



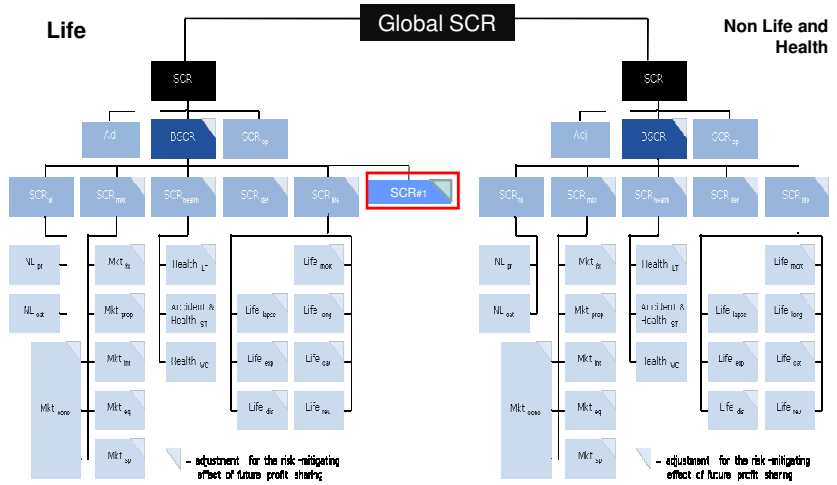
14) Modeling one (or more) risk module and one (or more) risk sub-module from a different module for 1 or more lines of business



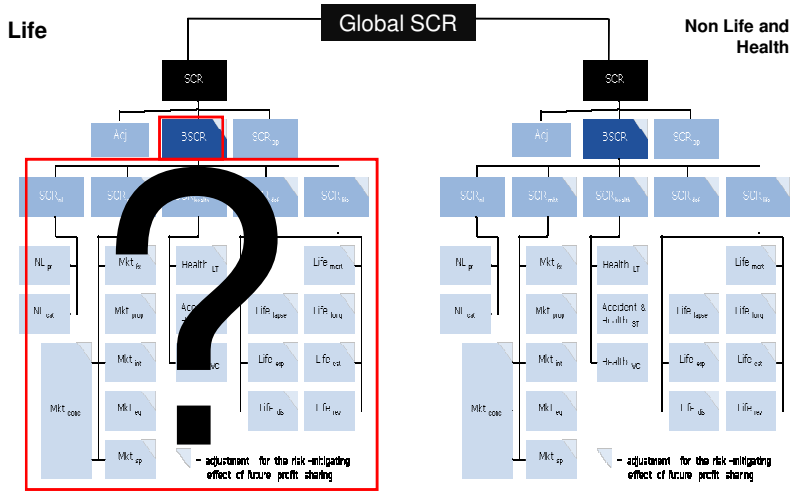
15) Different risk categorization either modules/sub-modules from the same/different risk module for 1 or more lines of business (e.g. credit risk = counterparty default + spread risk + migration risk for Life business)



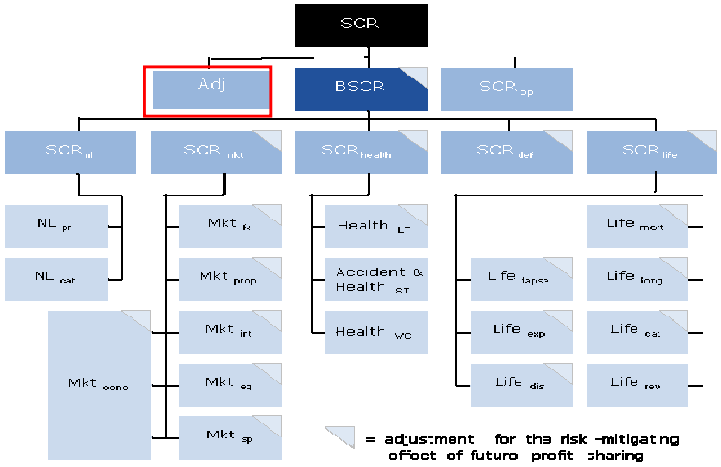
16) Risks not modeled in the standard formula for 1 or more lines of business (e.g. risk for life business)



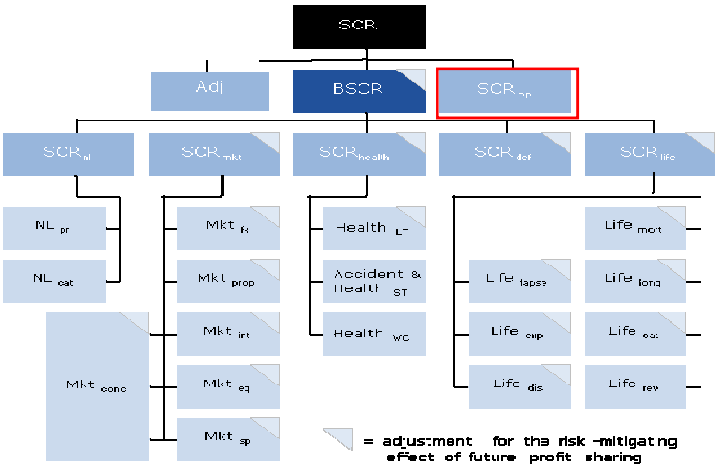
17) Non modular model risks for 1 or more lines of business (holistic model for the BSCR of the life business)



18) Modeling the adjustment for the loss-absorbing capacity of technical provisions and deferred taxes



19) Modeling the capital charge for operational risk



Annex B: Examples of situations where the standard formula correlation matrix may not be used

I. Only one or some major lines of business are modelled

A. All risks (modules) within one or more major business unit are modelled

E.g.: partial internal models for groups. Some solo entities use the full internal model while other use the standard formula (for instance a full internal model for a life entity and the standard formula for a non life entity). Undertakings would have to apply the aggregation and deduction approach (that is no diversification benefits are taken into account) if they wanted to use the internal model result's, they could not use the consolidation approach (the default approach) or they would have to apply the standard formula for the whole group.

B. Only one or some risk (modules) within one or more major business unit are modelled

E.g.1: to model only market risk, counterparty default and life underwriting for ring fenced funds or for with profit funds.

E.g.2: to model only insurance underwriting risk for Motor and Home but not model other classes, such as commercial.

C. Only some sub-risk (modules) within one or more major business unit are modelled

E.g.: to model only expenses risk and lapse risk for unit linked products.

II. Only some sub risks (modules) are modelled for the whole business

A. Within the same risk module

E.g.1: to model interest rate risk and credit spread risk (separately assuming different dependencies from the standard formula or simply to model them jointly)

E.g.2: where the ESG model some but not all of the market risks, giving the combined output of some market risks, (for instance equity, interest rates and credit spreads), but not for others (*e.g.* currency exchange rates, property risk and concentration risk)

B. Of different risk modules

E.g.: where the key market risks (equity and interest rates) and lapse risks are modelled together, due to their dynamic interplay.

Annex C: Impact assessment tables and narrative

Integration of partial internal models in the standard formula for the determination of the solvency capital requirement

Narrative Policy Options of the impact assessment

In its Call for Advice of 1 April 2009, the Commission has asked CEIOPS to contribute to the Commission's impact assessment of the Level 2 implementing measures[11]. To this end, a list of issues has been set up by the Commission and CEIOPS, identifying the Level 2 implementing measures that should be accompanied by an impact assessment. The objectives of the issues have been selected among the list of objectives used by the Commission in its Level 1 impact assessment[12]. On 12 June 2009, the Commission has issued an updated list of policy issues and options, to which reference is being made[13]. This impact assessment covers issue 11 of the list of policy issues and options.

Two summary tables accompany the impact assessment, published in a separate excel document.

Description of the policy issue and options

C.1. The impact assessment aims to identify the most appropriate way to integrate the results of the partial internal model with the results of the standard formula. Three policy Options have been considered.

C.2. For all Options, whenever the direct application of the standard formula correlation matrix:

- is possible (feasibility test) and
- there is no strong evidence that it is inappropriate to integrate the partial internal model's results into standard formula's results (appropriateness test),

the standard formula correlation matrix coefficients shall be used to integrate the partial internal model's results into the standard formula's results.

C.3. If the standard formula correlation matrix is neither feasible nor appropriate, then the policy Options differ as follows:

- Option 1: Integration of partial internal models using only coefficients prescribed by supervisory authorities;
- Option 2: Integration of partial internal models using techniques provided by supervisory authorities or – if these are not possible or

[11] http://www.ceiops.eu/media/files/requestsforadvice/EC-april-09-CfA/EC-call-for-advice-Solvency-II-Level-2.pdf
[12] http://ec.europa.eu/internal_market/insurance/docs/solvency/impactassess/final-report_en.pdf
[13] http://www.ceiops.eu/media/files/requestsforadvice/EC-June-09-CfA/Updated-List-of-policy-issues-and-options-for-IA.pdf.

there is strong evidence that these are inappropriate – dependency structures and parameters provided by the undertaking.

- Option 3: Integration of partial internal models using dependency structures and parameters provided by the undertaking or – if these are not approved by the supervisory authority - techniques provided by supervisory authorities.

C.4. Details of the feasibility and appropriateness tests are considered in Section bellow, dealing with the detailed policy Option descriptions.

Detailed policy Option description

C.5. As described above there is a feasibility test, as well as an appropriateness test which is used, in the first instance, to consider whether the standard formula correlation matrix should be used. Furthermore, depending on the Option chosen, these tests may also need to be applied to the techniques provided by supervisory authorities in Level 3 and/or the dependency structures and parameters provided by the undertaking.

Feasibility test

C.6. The feasibility test for an integration technique is to determine whether it is possible to integrate the partial internal model with the standard formula using the chosen integration technique.

C.7. An example where the feasibility test would not be passed for the standard formula correlation matrix would be where the undertaking models one major business unit and uses the standard formula for another major business unit. In this case, the standard formula correlation matrix does not have a correlation co-efficient reflecting the dependency between the two major business units, and thus the standard formula correlation matrix as an integration technique is not feasible. More examples of this are given in the description of policy Option one below.

Appropriateness test

C.8. The appropriateness test for the integration technique looks at whether it is appropriate to use an integration technique to integrate the partial internal model and the standard formula to produce the SCR for the undertaking. CEIOPS requires that undertakings provide "strong evidence" to the relevant supervisory authority that this integration technique is inappropriate to be allowed to move to the next stage of selecting an integration technique.

C.9. The general principles for assessing inappropriateness are that the resulting SCR "*more appropriately reflects the risk profile of the undertaking*"[14] and produces an SCR that "*meets the principles of Subsection 1 of Section 4 of the Directive*", the key ones in this context being:

a. All quantifiable risks are taken into account

b. The SCR is calibrated to VaR 99.5% over one year

C.10. In showing strong evidence, it is up to the undertaking to demonstrate that using the integration technique would produce an SCR that does not meet

[14] Article 111.1(b)

these principles. More specifically, CEIOPS considers that the process for collating the strong evidence required to show that the general principles listed above are not met shall include at least an analysis of some or all of the following elements:

a. **Equivalence of the SCR**: the resulting SCR is not equivalent to VaR 99.5% over one year. This may include the use of stress and scenario testing to demonstrate that the resulting SCR is not equivalent to VaR 99.5% over one year. The capital charges at a more granular level (e.g. risk module level) shall also correspond to VaR 99.5% over one year.

b. **Risk profile**: the risk profile of the undertaking makes the assumptions underlying the integration technique largely invalid. Deviations in the risk profile could be identified by either qualitative or quantitative techniques such as the analysis of ratios or by stress tests. In addition, the undertaking may have sufficient information about the non-modelled risk and its relationship to the modelled risk to demonstrate that the integration technique is invalid. In these circumstances a supervisory authority will need to consider carefully whether the undertaking should be required to extend the scope of the model to cover the non-modelled risk so that the relationship claimed is subject to the full standards and governance requirements of the modelling regime.

c. **Data**: The undertaking may have additional data or other evidence that allows analysis of the correlations and shows a different relationship. This data may be specific to the undertaking, or may relate to market evidence related to the co-dependencies between risks affecting that particular undertaking. In many cases, this data may also be linked to other elements used to show the strong evidence, specifically, the data may show that the risk profile varies from that assumed by the standard formula.

   An example of this is given below:

   An undertaking may have information about how the modelled risk will react to large changes in the un-modelled risk. Consider a life undertaking, mainly selling investment type products to institutional investors. The undertaking models its lapse risk, as the risk profile of the behaviour of institutional investors is different to that of the risk profile assumed in the standard formula for lapses.

   Assume the undertaking invests mainly in non-complex assets and that the standard formula is therefore appropriate for the market risk which is not modelled. Even though the undertaking does not model its market risk, it may still have quantitative and qualitative information about how the policyholders have behaved in past market conditions, including extreme conditions. The undertaking will therefore have data, which along with a qualitative analysis including expert judgement, may provide enough evidence to determine a dependency structure between the modelled and non-modelled risks.

d. **Use test**: The fact that an undertaking uses a different integration technique alone does not constitute enough evidence to reject the standard formula. It will always have to be supplemented by further analysis, which may include elements such as those set out in a) to c) above.

The rationale of the Use test[15] sets out that supervisors can take additional comfort if the internal model is used by the undertaking. This rationale extends to parts of the internal model, including the integration technique. Thus if undertakings use another integration technique, the supervisory authority may take some comfort as to the appropriateness of this integration technique. The higher the degree of modelling freedom given to undertakings the higher the emphasis put on the use test. For the purposes of this issue, the use test is a necessary but not sufficient condition.

C.11. CEIOPS recognises that it would be difficult for the standard formula correlation matrix, or for any integration technique, to meet all of the above criteria perfectly. Therefore, CEIOPS considers that it shall only be possible to reject the integration technique where the analysis of the items above concludes that the evidence to reject the standard formula correlation matrix is strong.

C.12. Strong evidence means that there is significant evidence that the integration technique is inappropriate.

C.13. The undertaking shall perform a self assessment from the analysis of the above elements to determine whether the evidence is strong or not. The appropriateness test is subject to the usual model validation requirements set out in CEIOPS Advice on Tests and Standards for internal models approval. When determining the strength of the evidence, undertakings may use both quantitative and qualitative indicators to gauge the strength of the evidence.

C.14. If the supervisory authority is of the opinion that the strong evidence shown by the undertaking is not appropriate, the supervisory authority may force the undertaking to use the standard formula's integration technique to integrate the partial internal model with the standard formula.

Option 1

C.15. Whenever the direct application of the standard formula correlation matrix:

- is possible (feasibility test) and
- there is no strong evidence that it is inappropriate to integrate the partial internal model's results into the standard formula's results (appropriateness test),

the standard formula correlation matrix shall be used to integrate the partial internal model's results into the standard formula's results.

[15] Ref to Section 3.3.1 of CEIOPS Advice on Tests and Standards for internal models approval

C.16. If the direct application of the standard formula correlation matrix fails the feasibility test, the supervisory authorities shall decide which coefficients shall be applied. In these circumstances, the coefficients prescribed by supervisory authorities shall have to be consistent with Subsection 1 of Section 4 of Chapter VI of the Level 1 Text to allow the partial internal model to be fully integrated in the SCR standard formula and shall have to comply with the standards set out in Articles 120 to 125 and adequately and appropriately reflect the risk profile of the undertaking. The adaptation to be made to the use test in this case is that scope of the use test will be the same as the partial model, that is, the use test is not applicable to the integration technique prescribed by the supervisory authority

C.17. Examples of this would be when modelling two or more risk modules jointly (Annex 1 – example 1c)), modelling two risk sub-modules jointly (Annex 1 – examples 3b1) and 3b2)), different risk categorization than in standard formula (Annex 1 – example 5), modelling risks not covered by the standard approach (Annex 1 – example 6), not modelling all lines of business for risk modules/sub modules modelled (Annex 1 - examples 10 to 17). Further examples are provided in Annex 2.

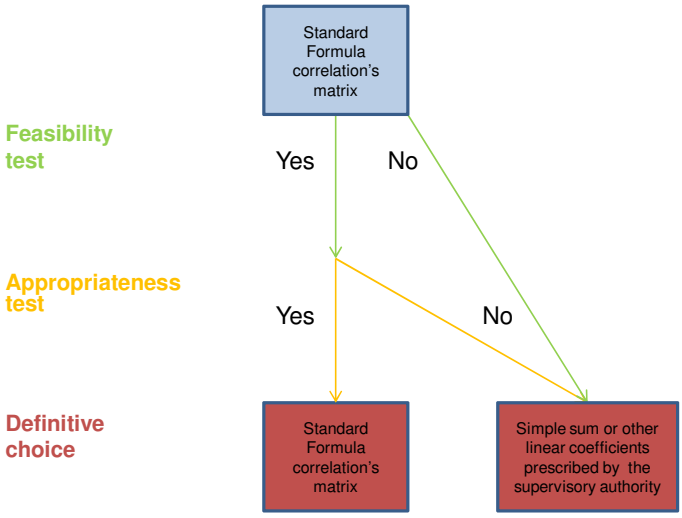
C.18. If the standard formula correlation matrix is possible, this will typically occur when

- the partial internal model follows the same risk categorization and modular structure as the standard formula; and
- within the limited scope of the partial internal model all lines of business are modelled (Annex 1 – examples 1a), 1b), 2a), 2b), 3a1), 3a2) and 4)).

C.19. If the standard formula correlation matrix passes the feasibility test, the undertaking must consider the appropriateness of the standard formula, as set out in the Section dealing with the appropriateness test. If the application of the standard formula correlation matrix is possible but not appropriate, supervisory authorities will decide which coefficients the undertaking shall apply. These may vary from simply assuming no diversification benefits between the partial internal model's results and results from the standard formula (in most cases simply summing the results, i.e. assuming a linear correlation equal to one), to prescribing a different coefficient. In these circumstances, the coefficients prescribed by supervisory authorities shall have to be consistent with the referred Subsection 1 of Section 4 of Chapter VI of the Level 1 Text so to allow the partial internal model to be fully integrated in the SCR standard formula and shall have to comply with the standards set out in Articles 120 to 125 and adequately and appropriately reflect the risk profile of the undertaking.

C.20. The decision tree to be followed in this process is illustrated bellow.

Option 1: decision tree on partial models' integration



C.21. If the standard formula correlation matrix is neither feasible nor appropriate, it is impossible to identify a priori the most suitable technique applicable to every possible case. Therefore, some degree of flexibility should be allowed to supervisory authorities. Several factors may be taken into account[16]:

- The nature, scale and complexity of the risks inherent in the business of the undertakings;
- The joint behaviour of the risks and/or lines of business modelled under the internal model and under the standard formula;
- The potential scale of the diversification benefits between the risks that fall under scope of the partial internal model and that which is not modelled;
- The marginal behaviour of the risks and/or lines of business modelled under the internal model and under the standard formula;
- The information available (i.e. data and expert judgment);
- The business model of the undertakings;
- The risk ranking ability of the model after the integration into the standard formula;
- The analysis of specific stress scenarios;

[16] This is not an exhaustive list

- The existence of plans to extend the scope of application of the model (e.g. either to a full internal model or to a level where it could be easily integrated into the standard formula).

Option 2

C.22. As in Option 1, whenever the direct application of the standard formula correlation matrix:

- is possible (feasibility test) and
- there is no strong evidence that it is inappropriate to integrate the partial internal model's results into standard formula's results (appropriateness test),

the standard formula correlation matrix shall be used to integrate the partial internal model's results into the standard formula's results.

C.23. If the direct application of the standard formula correlation matrix is not possible or if the supervisory authority is satisfied that is strong evidence that it is inappropriate, the undertakings shall use one of the integration technique that will be provided by CEIOPS in its Level 3 guidance.

Criteria for choosing from the list:

C.24. CEIOPS does not wish the selection process followed by undertakings to be unduly onerous. CEIOPS considers that Solvency II is an enabling measure, and that undertakings should be encouraged to develop internal models that reflect their risk profile. This naturally includes the development of partial internal models, whether as a permanent Option or as part of the development of a full internal model. CEIOPS' Advice on the approach to choosing a technique from the Level 3 list reflects this view - if the approach is unduly burdensome, this may discourage smaller undertakings from applying to use an internal model to calculate the SCR. In CEIOPS' opinion, this would be disproportionate. CEIOPS proposes a two-stage process for selection from the list.

Step a)

C.25. CEIOPS considers that undertakings should:

a. review the full Level 3 list of techniques to ensure they are familiar with each of them at a high level, and consider the advantages and disadvantages of each; and

b. review the circumstances in which each technique is or is not appropriate, and assess whether and how these circumstances apply in their case.

C.26. This initial review should allow undertakings to identify a short-list of one or more appropriate techniques. In the event that none of the listed techniques is identified as appropriate, undertakings move to the next stage of this Option. Supervisory authorities may require the undertaking to test alternative techniques and provide strong evidence that such techniques are inappropriate in order to prevent cherry-picking.

Step b)

C.27. Assuming that one or more techniques can be identified, undertakings will need to carry out a more in-depth review of the short-listed techniques. CEIOPS expects that undertakings would assess the techniques under the following headings:

a. Does the resulting SCR reflect the risk profile of the undertaking, including whether the resulting calibration reflects the Solvency II standard for the SCR;

b. What data and expert judgement is needed;

c. How the techniques allow capital allocation and ranking of risks across the SCR;

d. How the technique links to the risk management system and other uses of the internal model.

C.28. Undertakings can then make a decision as to the appropriate technique from the short list for their risk profile. Undertakings need to document the process and rational behind their choice.

Appropriateness of the technique chosen

C.29. Once the undertaking has chosen a technique from the list, the undertaking shall test whether there is strong evidence that the technique chosen is inappropriate. The testing for strong evidence is as described in the appropriateness test, set out before.

C.30. CEIOPS is aware of the danger of the undertaking specifically choosing a technique where the undertaking can show that it is inappropriate, as this will allow the undertaking to be able to consider their own integration technique. Thus, the supervisory authority may require the undertaking to test any of the other techniques listed by CEIOPS against the strong evidence.

Characteristics of the techniques

C.31. These techniques shall aim to replicate the properties of the integration techniques used in the Standard Formula (which themselves attempt to comply with the principles in Subsection 1 of Section 4 of the Level 1 Text) when the structure of the partial internal model does not fit the standard formula correlation matrix. CEIOPS recognises that one of the main benefits to undertakings of the list of techniques is that it will potentially reduce costs in respect of developing integration techniques. For this reason, the Level 3 guidance will aim to be as precise as possible as to the application of the integration technique. The level of expert judgment incorporated in the application of the techniques will vary, the application of some techniques will have none to few expert judgment, whereas the application of other will incorporate a higher degree of expert judgment It is stressed once more that these techniques do not apply for the aggregation of results within the limited scope of the partial internal model.

C.32. The aim of the Level 3 list of techniques is to provide CEIOPS with assurance that undertakings are using an appropriate approach to integrating the partial internal model and the standard formula. However, CEIOPS wishes to strike a balance between prescription of techniques,

which may undermine the Use test, and complete flexibility, which may lead to scope for cherry-picking. However, undertakings should remain aware of

a. the need to comply with the appropriateness test;

b. the need to comply with the tests and standards, as adapted for the integration technique; and

c. that the supervisory authority will review the selected technique to be assured that it is indeed one of the Level 3 techniques.

C.33. When an undertaking chooses a technique from the Level 3 list, the technique shall be followed as set out in the Level 3 description. Undertakings should regard the academic and actuarial literature as helpful references and assess how the technique will be applied by them.

C.34. This Option gives CEIOPS the responsibility of managing a list of techniques capable of producing a result that is consistent with the principles set out in Subsection 1 of Section 4 of the Level 1 Text.

Criteria and process for adding techniques to the list

C.35. CEIOPS recognises that it will be important to keep the Level 3 list of techniques up to date, taking into account information gained by supervisory authorities about new techniques, or refinements to techniques, as part of their assessment of internal models and as part of the supervisory review process. CEIOPS will review the list from time to time and will make amendments in line with current best practice and research. This may include removing techniques from the list.

C.36. However, CEIOPS recognises that the insurance industry will wish to develop new techniques of integrating, and many of these will be applicable to the integration of partial internal models and the standard formula. This is in line with the Foundation Principle of the Use test, and CEIOPS very much encourages innovation. CEIOPS can envisage a situation where an undertaking develops a new integration technique and wishes to have this included in the Level 3 list.

C.37. If the information required is provided by the undertaking, CEIOPS does not foresee major problems with including new techniques. CEIOPS may review any proposed techniques against the following criteria:

a. Is the technique a completely new technique, or a derivation of techniques already listed? In the latter case, the Level 3 list could be amended rather than added to;

b. How extensively the technique is used;

c. The effectiveness of the technique in producing an appropriately calibrated, risk reflecting result;

d. Whether the technique could be widely used;

e. The data requirements and need for expert judgement;

f. The quality of the academic and actuarial references.

C.38. The aim of the Level 3 guidance on each technique is to give undertakings enough information to choose an appropriate technique for the integration technique and then apply it in a way that reflects their own risk profile and also is proportionate to the nature, scale and complexity of their risks.

C.39. For each integration technique, CEIOPS will set out in the Level 3 guidance the following, this may not be an exhaustive list:

a. The name of the technique

b. A brief outline describing the technique including

i. The main data requirements (we may need to expand this and link to Article 121)

ii. The areas needing expert judgement (link to Article 121)

iii. The calculation technique

c. References to any academic / actuarial literature that describes the technique, with pointers to the relevant sections of the literature.

d. The advantages of the technique

e. The disadvantages of the technique

f. The circumstances when the technique is inappropriate

C.40. It should be noted that CEIOPS' responsibility for maintaining this list does not diminish the responsibility of undertakings to assess the appropriateness of the particular technique chosen and to justify this in the application to use an internal model. The ongoing appropriateness will also form part of the validation standards required for the internal model. The techniques listed at Level 3 will be mathematical techniques, each with pros and cons, and drawbacks.

C.41. CEIOPS provides Advice on the adaptations of the tests and standards for internal models in respect of the integration technique between the partial internal model and the standard formula in Section 3.8. CEIOPS recognises that this proposed approach to selecting an integration technique does have an element of restriction on undertakings by requiring them first to choose from a list of techniques specified by CEIOPS. However, CEIOPS also considers that

a. as the list is updated to reflect current practice,

b. as the list can be updated quickly and

c. as the descriptions of techniques are flexible enough to allow the technique to be applied to different undertakings,

undertakings can be expected to apply the tests and standards, in cases where the technique is selected from the Level 3 list.

C.42. When none of the techniques provided in the Level 3 guidance is feasible or if the undertaking is unable to select an appropriate technique from the list after following the process described above, undertakings may use, subject to supervisory approval, other integration techniques as in Option 3. Supervisory authorities always retain the power to

a. disagree with undertaking's integration technique and reject the model;

b. to approve it with terms and conditions;

c. require the undertaking to submit a transitional plan to extend the scope of the model to the level where it can be integrated in a

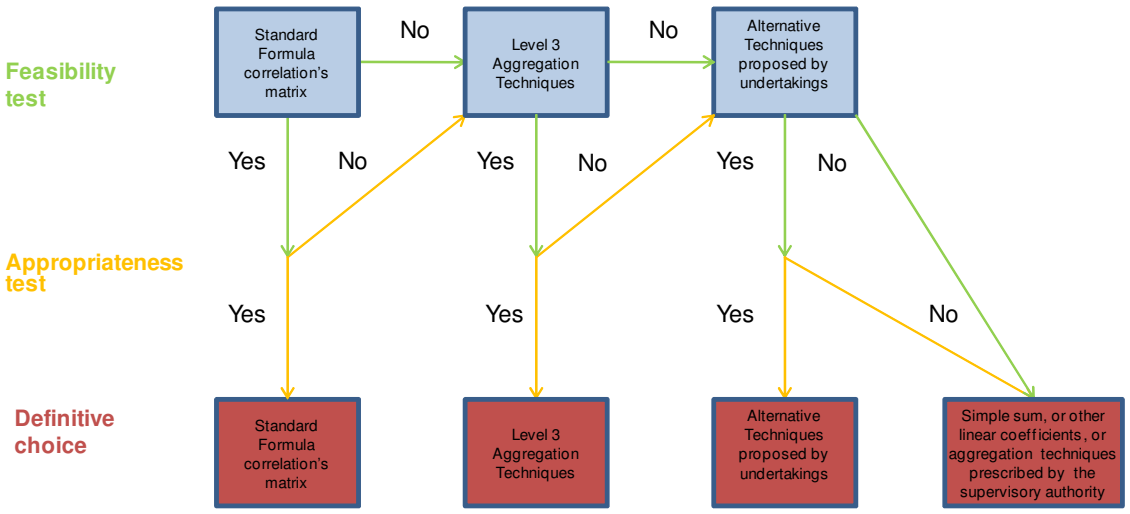
straightforward manner with the standard formula or so that another integration technique might be used.

C.43. This is in order to ensure that the design of the partial internal model is not chosen on purpose in order to make all the techniques provided in the Level 3 guidance inapplicable.

C.44. If the undertaking fails to demonstrate that the proposed integration techniques comply with all the provisions set on the previous paragraph, then the supervisory authority shall decide how the partial internal model is integrated. In doing so, supervisory authorities shall also take into account the considerations expressed under Option 1. However, compared to 1, under Option 2 the supervisory authority's choice is not limited to linear correlations coefficients (including simple sum of results).

C.45. The decision tree to be followed in this process is illustrated below.

Option 2: decision tree on partial models' integration



C.46. When assessing the proposed integration technique supervisory authorities may take into consideration the factors mentioned in Option 1, amongst other.

Option 3

C.47. As in Option 1, whenever the direct application of the standard formula correlation matrix:

- is possible (feasibility test) and
- there is no strong evidence that it is inappropriate to integrate the partial internal model's results into standard formula's results (appropriateness test),

the standard formula correlation matrix shall be used to integrate the partial internal model's results into the standard formula's results.

C.48. Otherwise, undertakings may use, subject to supervisory approval, other integration techniques, as long as their design is consistent with the referred Subsection 1 of Section 4 of Chapter VI of the Level 1 Text so to allow the partial internal model to be fully integrated in the SCR standard formula. The integration techniques shall also have to comply with the standards set out in Articles 120 to 126, particularly with the use test, so as to adequately and appropriately reflect the risk profile of undertakings.

C.49. Supervisory authorities always retain the power to

a. disagree with undertakings proposed integration technique and reject the model

b. to approve it with conditions,

c. require the undertaking to submit a transitional plan to extend the scope of the model to the level where it could be easily integrated with the standard formula.

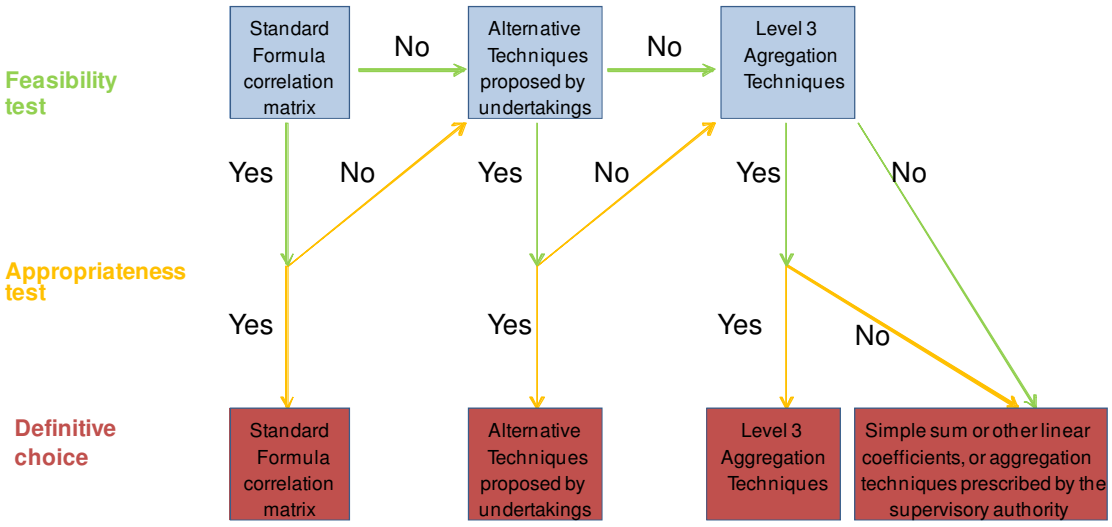
C.50. If the undertaking fails to demonstrate that the proposed integration techniques comply with all the provisions set out in the paragraph before, or if the undertaking is unable to develop a suitable integration technique, the undertaking will then use an integration technique from a list prescribed by CEIOPS in Level 3 guidance, as defined in Option 2 above. The criteria for choosing from the list and the characteristics of the techniques described in the list are the same as those which have been set out in Option 2 above.

C.51. If none of the techniques provided in the Level 3 guidance is feasible or if the undertaking is unable to select an appropriate technique from the list after the appropriateness test described above, then the supervisory authority shall decide how the partial internal model shall be integrated with the standard formula. In doing so, supervisory authorities shall also take into account the considerations expressed under Option 1. However, compared to Option 1, under Option 3 the supervisory authority's choice is not limited to linear correlations coefficients (including simple sum of results).

C.52. When assessing the proposed integration technique supervisory authorities may take into consideration, amongst other, the factors mentioned in Option 1.

C.53. The decision tree to be followed in this process is illustrated below.

Option 3: decision tree on partial models' integration



2) Impact on industry, policyholders and beneficiaries and supervisory authorities

Cost and Benefits

Policyholders and beneficiaries

C.54. Option 1 will likely have an indirect negative effect on policyholders and beneficiaries in the cases where this Option will lead to an inadequate SCR result due to the inappropriateness of the integration technique. The cost of an inadequate high SCR might be repercuted on policyholders (higher premium). An inadequate low SCR will lead to a lower level of policyholders' protection. The likelihood of this impact is medium, as premium charges depend also on other on drivers and the level of protection can be restored through a whole set of measures. The timing of this impact may vary, nevertheless, CEIOPS expect it to be of medium to long term.

C.55. Option 2 could have the same indirect negative effect as the Option 1 if the undertaking used a technique provided in the Level 3 guidance that is inappropriate to its risk profile. This can be avoided through the dialogue between CEIOPS and the industry (leading to the inclusion of more appropriate techniques in the Level 3 Guidance) and the development of an alternative technique by the undertaking. Therefore CEIOPs believes that this Option will have a permanent positive impact on policy holders.

C.56. As for Option 3, it will have a permanent positive impact on policy holders, namely in terms of premium charged and policyholder protection.

Undertakings

C.57. Regarding the impact on undertakings, Option 1 is most likely to have a permanent negative impact. As mentioned before, this Option may potentially lead to the miscalculation of the SCR and consequently to an inadequate risk and capital management (with the associated capital costs). Furthermore, Option 1 may also create some competitive distortions,

leading to situations where some undertakings will have to hold inappropriate levels of capital. In some cases too little, whereas in some others too much. These distortions and inefficiencies across the insurance industry may ultimately create an uneven playing field.

C.58. Despite the potentially severe disadvantages mentioned above, this Option has nevertheless non neglectable benefits for undertakings as it is a straightforward approach to apply for undertakings, with no modelling costs associated.

C.59. Option 2 gives undertakings more modelling freedom than Option 1 but less than Option 3. This is preferable if the additional flexibility of Option 3 does not result in a more adequate calculation of the SCR. Under this assumption Option 2 is the best way to achieve a level playing field as the use of defined techniques ensures an equal treatment. If the assumption does not hold it may still create some competitive disadvantages. Nevertheless those disadvantages are partially mitigated by the fact that whenever the integration techniques significantly deviate from the risk profile of an undertakings, the undertaking is allowed to use its own integration technique subject to supervisory approval.

C.60. Regarding undertakings, Option 2 overall also have the advantage of lower modelling cost than Option 3 as many circumstances undertakings will apply techniques already developed by CEIOPS. However, the restrictions that these Options impose may ultimately discourage innovation.

C.61. Therefore and overall CEIOPS believes this Option is likely to have a long term positive impact on undertakings.

C.62. Option 3 gives undertakings the highest degree of modelling freedom. This may allow undertakings to capture more appropriately their risk profile than with the other Options, ultimately leading to a more adequate calculation of the SCR. Under this assumption Option 3 will increase the likelihood of a level playing field being achieved. Modelling costs are higher than in Option 1 and 2, nevertheless if an undertaking is unable to develop a suitable integration technique it will apply the techniques already developed by CEIOPS. For these reasons CEIOPS believes that Option 3 is also likely to have a long term positive impact on undertakings.

C.63. Overall, irrespectively from the policy Option chosen, its impact (either positive or negative) is more likely to be felt by undertakings which by nature tend have higher diversifications benefits between the scope of the partial internal model and its complementary, such as composites, or multinational groups with several companies or branches in different countries and lines of business that are not all internally modelled. Some lines of business are more likely to be affected than other, namely heavy tail business with a significant exposure to non linear risks such as CAT risks, in this context the policy Option chosen will particularly affect reinsurance undertakings.

Supervisory authorities

C.64. The main benefits of Option 1 for supervisory authorities are that it is an approach simple to assess and compare. On the other hand, as stated before, this approach may lead in some circumstances to the miscalculation of SCR, causing negative impacts on policy holders and beneficiaries

protection and may ultimately create an uneven playing field. These concerns can be minored by establishing a transitional plan to extend the scope of the model up to a level where the internal model can be more adequately integrated. Furthermore, the prescription of a limited number of integration techniques (not say in many cases just one: to sum up the results) irrespectively of the models' structures and specificities would almost certainly contribute to an increase of systemic risk.

C.65. Additionally, this would impose a significant burden and reputational risk (e.g. when the integration technique it is proven to be inappropriate) on supervisory authorities, as they would have to be able to identify and prescribe correlations coefficients where it is not possible to use the ones from the standard formula. For example, for those risks not covered by the standard formula or where it is deemed not appropriate. Although this problem may be overcome by choosing simple and so called "prudent" solutions, the risks related to the miscalculation of the SCR, competitive distortions and inefficiencies (i.e. a uneven playing field) can be hardly mitigated. Moreover, internal models are expected to evolve, changes in internal models may lead to changes in the correlation matrices, exacerbating the referred resources requirements.

C.66. With Option 2 CEIOPS has the responsibility to manage a list of techniques consistent with the standard formula. In addition the supervisory authority has to judge the appropriateness of the chosen technique. Yet assessing techniques developed by the undertakings in Option 3 may be probably even more burdensome.

C.67. The prescription of an integration technique may create systemic risk. Yet systemic risk also arises if many undertakings error on the same side when modeling risks (e.g. subprime). This risk is partially mitigated with regular updates of the list of techniques taking into account the experience gathered from its application and market developments and also in the situations in which the undertaking is allowed to develop its own technique, subject to supervisory approval.

C.68. All Options involve some reputational risk. With option 2 the prescribed techniques might be inadequate. This risk is partially mitigated by the fact that whenever those integration techniques significantly deviate from the risk profile of an undertakings, the undertaking is allowed to use its own integration technique subject to supervisory approval. Additionally the fact that the list of techniques will be periodically assessed taking into account the experience gathered from its application and market developments will also mitigate this risk.

C.69. Finally, the risk of regulatory arbitrage is low under Option 2, given the list of techniques to be issued by CEIOPS at Level 3 Guidance and that whenever there is strong evidence that application of those techniques is inappropriate undertakings are allowed to use their own techniques subject to supervisory approval.

C.70. In conclusion CEIOPS expects Option 2 to have a long term positive impact on supervisory authorities.

C.71. As mentioned before Option 3 gives undertakings the highest degree of modelling freedom and this may allow undertakings to capture more appropriately their risk profile than with the other Options, ultimately leading to a more adequate calculation of the SCR. Under this assumption Option 3 will increase the likelihood of a level playing field being achieved and maintained and reduce systemic risk and will minimize reputational risk for supervisory authorities.

C.72. However, Option 3 may create systemic risk if undertakings error systematically on the same side (e.g. subprime).

C.73. With Option 3 there is still reputational risk for supervisors if models are approved that underestimate risks.

C.74. As Option 3 is harder to assess and compare for supervisory authorities than the other Options supervisory convergence may be more difficult to achieve as well as the risk of regulatory arbitrage .may be higher than in Options 1 and 2. This may be solved by issuing principles and further guidance. If the higher modelling freedom results in a more precise calculation of the SCR and supervisory convergence can be achieved Option 3 will lead to an outcome-focused consistency between supervisory actions preferable to the process-focused consistency of Options 1 and to a lesser extent Option 2.

C.75. In conclusion CEIOPS expects Option 3 to have a long term positive impact on supervisory authorities.

Likely Industry response

C.76. Industry will likely prefer Option 3 as it provides the highest degree of modelling freedom and it believes that would that would the most effective way to adequately capture undertaking's risk profile and to reduce systemic risk. From this perspective Option 1 is the least desirable while Option 2 lie in between. Option 2 may be also attractive for SMEs.

C.77. From an industry perspective the main advantage of Options 1 and 2 are the lower modelling costs.

C.78. If the higher modelling freedom of Option 3 resulted in a more accurate SCR calculation choosing other Options would be perceived by the industry as a disincentive for the use of partial internal models. This would have a negative impact whenever there are significant diversification benefits between the risks and lines of businesses that fall under the scope of the internal model and the remainder. This may be an issue for multinational groups, reinsurance undertakings and composite undertakings. It would be also an issue for SMEs by discouraging innovation and specialization. In some cases it might also force SMEs to choose between a potentially inappropriate partial internal model and a potentially more inappropriate standard formula.

C.79. Regarding Option 2, industry may raise some issues about the list of techniques to be prescribed at Level 3 guidance. They could argue that short lists raise the level of systemic risk, while long lists may turn the task of choosing the technique unduly burdensome and will make very difficult to allow for situations in each undertakings are allowed to use their own integration techniques which will discourage the development of other

integration techniques. Therefore striking an adequate balance on how Option 2 will work on practice would be a critical point for the industry.

C.80. Industry will also disagree, especially in the situations where undertakings are able to develop and justify an appropriate technique, for having to use a prescribed technique unless the application of this former will result in a significant deviation from their risk profile.

C.81. In any circumstance the industry may fear that supervisors start prescribing the same type of integration technique for the part that is actually modelled within the limited scope of the model (even though there is nothing in this Consultation Paper to substantiate such concerns). Industry may also perceive Option 2 as diminishing the importance of the use test.

3) Operational objectives

C.82. The integration of partial internal models falls under the scope of several relevant operational objectives, these are "introduce risk-sensitive harmonized solvency standards", "harmonise supervisory powers, methods and tools", "introduce proportionate requirements for small undertakings" and "ensure efficient supervision of insurance groups and financial conglomerates".

C.83. Additionally, it also be assessed the level of consistency and sustainability of each policy options.

C.84. Consistency in this context refers to consistency in how the integration techniques are applied both in terms of process and outcomes in order to meet the relevant operational objectives.

C.85. Sustainability refers to the probability of a policy option to ensure the continuous fulfillment of the operational objectives as time evolves.

4) Comparison between the different Options based on the efficiency and effectiveness in reaching the relevant operational objectives defined in Section (3)

C.86. The comparison and ranking of the policy Options will be based on the effectiveness and efficiency of each of them in reaching the relevant objectives defined in point (3). Effectiveness is defined as the extent to which Options achieve the objectives of the proposal. Efficiency is defined as the extent to which objectives can be achieved at least cost (cost-effectiveness). The source of evidence to this aim will be the qualitative information gathered from the Stock-taking report on the use of Internal Models in Insurance, the QIS4 Exercise and from further presentations and discussions with industry's stake holders.

C.87. Option 1, taking into account the referred in Section (2) about its expected costs, the level to which achieve the objective to "introduce risk-sensitive harmonized solvency standards" is low and also with a low degree of efficiency.

C.88. This Option ensures consistency to a medium degree, because it ensures consistency in terms of process but possibly not in terms of outcomes, as the final result may not adequately take into account undertakings' specific risk profile.

C.89. CEIOPS believe that this Option fulfills the objective to "harmonise supervisory powers, methods and tools" to a small degree, with a medium level of efficiency (the implementing cost are low but costs of the fallacies of this Option may be high).

C.90. Using the same reasoning applied to assess the achievement of the objective "introduce risk-sensitive harmonized solvency standards" and the consistency of that Option, CEIOPS believe this Option fulfills "ensure efficient supervision of insurance groups and financial conglomerates" the objective also to low degree and with a medium degree of efficiency as well.

C.91. Additionally, this Option fulfills the objective to "introduce proportionate requirements for small undertakings" to a small degree and with a medium degree of efficiency as well, since for SMEs with partial internal models with a modular structure similar to the standard formula that can be easily integrated into the standard formula this Option will be straightforward and costless, but for all other cases this Option may be ineffective or if a plan to extend the scope of the model is required may be disproportionate for SMEs.

C.92. CEIOPS does not consider this Option to be sustainable as time goes by it may prevent the level playing field to be achieved, may endanger policy holder protection and it may conflict with proportionality principle.

C.93. As for Option 2, this Option meets the objective to "introduce risk-sensitive harmonized solvency standards" to a medium degree and with medium degree of efficiency. There is a certain level of risk sensitivity as undertakings are allowed to use other techniques if there is strong evidence that their risk profile is not adequately captured by the techniques prescribed in Level 3 guidance. While an outcome-focused harmonization would certainly be preferable, the process-focused harmonization of Options 2 may be the best one can get: compared to a full internal model there are fewer undertaking specific data as one or more risks are not modelled internally. This makes it harder for the individual supervisory authoirty to decide whether the requirements of the statistical quality standard are met and consequently more difficult to ensure harmonization among supervisors across Europe. The degree of efficiency is medium. For many undertakings the costs of implementing techniques prescribed in Level 3 guidance will be lower than the costs of building a model of their own.

C.94. CEIOPS consider that Option 2 meets the objective "harmonize supervisory powers, methods and tools" to a high degree with a high degree of efficiency given that the process to integrate partial internal models will be a clearly established step-by-step approach both for undertakings as well for supervisory authorities.

C.95. This Option ensures consistency to a medium degree with a medium level of efficiency. It certainly ensure consistency in terms of process but may not achieve such level of consistency in terms of outcomes, since an undertaking will have to use a level 3 technique (once in step 2 of the aggregation process) unless it has strong evidence that result of that technique will translate into significant deviations from its risks profile. While an outcome-focused consistency would certainly be preferable the

process-focused consistency of Options 2 may be the best one can get (see the last but one paragraph).

C.96. CEIOPS qualify the level of sustainability of this policy Option as medium due to its trade off between simplicity and comparability on one hand and reflection of the undertakings' risk profiles and adequacy of SCR calculation, on the other, because of this also CEIOPS considers the effectiveness of this Option for the objective "introduce proportionate requirements for small undertakings" as high and with a high degree of efficiency. Finally CEIOPS believes the objective "ensure efficient supervision of insurance groups and financial conglomerates" is achieved to a medium degree (because their risk profile may not always be adequately captured) and with a medium level of efficiency.

C.97. Option 3 meets the objectives to "introduce risk-sensitive harmonized solvency standards" to a medium degree and with a medium degree of efficiency. While it is in principle more risk sensitive, it might be harder to achieve harmonization: Compared to a full internal model there are fewer undertaking specific data as one or more risks are not modelled internally. This makes it harder for the individual supervisory authoirty to decide whether the requirements of the statistical quality standard are met and consequently more difficult to ensure harmonization among supervisors across Europe. The costs of modelling will generally be higher than with Options 1 and 2.

C.98. CEIOPS qualifies the level of consistency of this policy Option as medium. This option may ensure consistency in terms of outcomes, but it will make more difficult the harmonization of supervisory authorities decisions and comparability is harder to achieve (process consistency). Yet, in the medium to long run, as time evolves and experience is gathered and shared between supervisors, a higher degree of harmonization can be achieved. Consequently this Option fulfils the objectives "harmonise supervisory powers, methods and tools", "ensure efficient supervision of insurance groups and financial conglomerates" to a medium degree and with a medium level of efficiency as well.

C.99. CEIOPS qualify the level of sustainability of this policy Option as medium due to its trade off between reflection of the undertaking's risk profile and adequacy of SCR calculation on the one hand and comparability and harmonization on the other hand. Option 3 ensures the full achievement of the objective "introduce proportionate requirements for small undertakings" although to a medium degree of efficiency because undertakings that cannot or wish not to develop their own aggregation mechanism need to undergo for second stage of the policy option, before they use Level 3 aggregation techniques.

C.100. From the analysis above CEIOPS concludes that the most suitable Options are Options 2 and 3, with first one having the highest level of harmonization. As a lesson learned from the financial crisis CEIOPS that started on 2007 believes that a high level of harmonization will be crucial.

C.101. In conclusion, taking into account the potential cost and benefits for policyholders and beneficiaries, undertakings and supervisory authorities, the likely industry response, the effectiveness and efficiency level to meet

the relevant objectives, and its sustainability and comparability level CEIOPS recommends Option 2.